KEELER DUNES DUST CONTROL PROJECT

DRAFT ENVIRONMENTAL IMPACT REPORT / ENVIRONMENTAL ASSESSMENT

VOLUME I

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EXECUTIVE SUMMARY

ES EXECUTIVE SUMMARY

ES.1 BACKGROUND AND PROJECT OVERVIEW

The requirement to control dust emissions from the Keeler Dunes in order to demonstrate attainment of the federal standard within the OVPA is specified in the 2008 SIP.[1] The Great Basin Unified Air Pollution Control District (District) is responsible for developing a dust control strategy and plan for the Keeler Dunes PM_{10} emissions.

One of the largest remaining sources of uncontrolled PM_{10} emissions in the Owens Valley is the Keeler Dunes. The Keeler Dunes were specifically identified in the 2006 Settlement Agreement and the 2008 SIP as a source of PM_{10} that require controls in order for the OVPA to meet the federal PM_{10} standard and to meet the California State PM_{10} standard in Keeler and Swansea. Dust from the dunes cause an average of six violations of the National Ambient Air Quality Standards for PM_{10} every year in the community of Keeler. These violations affect the residents of the communities of Keeler and Swansea, as well as local workers and visitors that travel through the area, and are a documented cause of safety problems on SR 136. As a result, the District began a focused investigation of the Keeler Dunes in 2008 to develop and implement a control strategy for dust emissions from the dunes.

The process of investigating the source and responsibility for emissions and possible best available control measures, which was undertaken between 2011 and 2013, generated substantial controversy among the stakeholders. However, in 2013, the District and the LADWP executed the 2013 Settlement Agreement that allows the District to move ahead expeditiously with implementation of the dust control project in the Keeler Dunes with the support of LADWP.[2] According to the terms of the 2013 Settlement Agreement, the LADWP will provide ten million dollars ($10,000,000) to the District as a public benefit contribution for implementing dust controls in the Keeler Dunes. In return, the District agreed to forever release the LADWP from any and all liability for dust emissions, regardless of origin, from the Keeler Dunes. The funds from the LADWP for the “Keeler Project” were received by the District in December 2013.

ES.2 PROPOSED PROJECT / PROPOSED ACTION

The proposed project / proposed action would implement DCMs (native vegetation and straw bales) on 194 acres of the project study area. The District designed the proposed project / proposed action to minimize environmental impacts by applying two different dust control levels at the project site (Figure 2.2.1-1, *Dust Control Measure Locations and Minimum Efficiency Requirements*). A dust control efficiency of 95 percent would be implemented on approximately 177 acres and would result in an immediate cover by the bales of approximately 12.1 percent. The proposed project / proposed action would implement 85 percent control on 17 acres, resulting in a 6.7 percent bale cover. Additional surface cover is expected from the shrubs as they fully develop and mature. The total acreage (177 acres at a 95 percent control efficiency and 17 acres at an 85 percent control efficiency) for DCMs to which native vegetation would be applied is 194 acres.

[1] Great Basin Unified Air Pollution Control District. 28 January 2008. *2008 Owens Valley PM10 Planning Area Demonstration of Attainment State Implementation Plan*. Bishop, CA.

[2] Great Basin Unified Air Pollution Control District and Los Angeles Department of Water and Power. 25 June 2013. Phase 7a and Keeler Dunes Settlement Terms. Available at: http://www.gbuapcd.org/owenslake/Phase7a/LADWP-GBUAPCD-Phase7a&KeelerDunesSettlementTermsProposedFinal20130625.pdf

Approximate numbers of plants and straw bales necessary to achieve an estimated 85 and 95 percent dust control efficiency on a total of 194 acres are summarized in Table 2.2.1-1, *Proposed Project / Proposed Action Dust Control Applied to 194 Acres*.

TABLE ES.2-1
PROPOSED PROJECT / PROPOSED ACTION DUST CONTROL APPLIED TO 194 ACRES

Element	Minimum Control Efficiency (%)	Number of Acres	Number Required per Acre	Total Number Required
Native plants	95	177	1,983	350,991
Native plants	85	17	1,092	18,564
Total plants				**369,555**
Straw bales*	95	177	661	116,997
Straw bales	85	17	364	6,188
Total straw bales				**123,185**

Note: * The dimensions of the straw bales are 0.6 x 0.4 x 1.17 meters.

The water supply for plant irrigation will come from the Fault Test well and will be delivered via 8,000 gallon water trucks to each of the three staging areas along the Old State Highway. Water would be transferred to the small ATV water tanks directly from water trucks that would park in the staging areas. Water will then be applied via ATVs towing a trailer with a water tank (~150 to 200 gallon capacity) into the proposed project / proposed action area. The initial irrigation during planting would take approximately 15 weeks to complete.[3] Each supplemental irrigation event would take a crew of 10 workers approximately 10 weeks. See Table 2.1.5.2-2 for a summary of the water requirements for the irrigation events included in the proposed project / proposed action.

ES.3 PURPOSE AND NEED

This document is a joint Environmental Impact Report / Environmental Assessment (EIR/EA) that meets the requirements of both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA) for the Keeler Dunes Dust Control Project (proposed project / proposed action). The EIR/EA describes the existing environment that would be affected by, and the environmental consequences that could result from, the proposed project / proposed action and alternatives, as described in Section 2, *Proposed Project / Proposed Action and Alternatives*, of this document.

The EIR/EA (State Clearinghouse No. 2011101065/EA) is a public document that analyzes the potential environmental effects associated with the approval of the proposed project / proposed action in accordance with both CEQA and NEPA.

This document has been prepared by both the Great Basin Unified Air Pollution Control District (District; state lead agency pursuant to CEQA and cooperating agency for NEPA) and the U.S. Department of the Interior Bureau of Land Management (BLM) Bishop Field Office (federal lead agency under NEPA [40 Code of Federal Regulations {CFR} 1508.15]). The EIR/EA provides sufficient evidence and analysis for determining the significance of effects from the proposed project / proposed action consistent with 40 CFR 1508.9 and serves as a basis for reasoned choice

[3] Assuming a crew of 10 workers working 5 days a week.

among proposed alternatives. Additional explanation of the joint nature of this document is provided in Subsection 1.6.

ES.3.1 DISTRICT PURPOSE AND NEED

The District's goal for control of dust emissions, consistent with the provisions of the federal and state Clean Air Acts, is to utilize measures that reduce PM_{10} exceedances while minimizing impacts to natural and cultural resources located within the Keeler Dunes and surrounding area. The dust control strategy includes establishment and management of native vegetation and the use of straw bales as temporary wind breaks to provide immediate control and to aid in vegetation establishment. The ultimate goal of the proposed project / proposed action is to implement a strategy that not only controls dust emissions from the Keeler Dunes but also protects resources and creates a natural landscape that is self-sustaining and can be operated and maintained with minimal inputs.

The District identified and prioritized six basic objectives that are important to achieving the proposed project / proposed action goals:

- Reduce the levels of windblown dust that are causing and contributing to exceedances of the NAAQS and California State standard for particulate matter (PM_{10}) air pollution
- Attain the NAAQS and California State PM_{10} standards in the communities of Keeler and Swansea
- Minimize impacts to natural resources
- Minimize impacts to historic properties below the threshold of adverse effect
- Create a landscape that mimics comparable natural environments
- Be self-sustaining and operated with minimal resources

ES.3.2 BLM PURPOSE

The BLM's purpose and need for action is to respond to the District's application for a right-of-way (ROW) to implement the proposed dust control measures (DCMs) on public land in the Keeler Dunes. Based on the analyses in this EIR/EA, the Bishop Field Manager will decide whether or not to grant a ROW for the proposed action or one of the alternatives and, if granted, what terms and conditions including minimizing measures and mitigation will be applied to the grant.

The BLM is authorized to grant ROWs on public lands for "facilities which are in the public interest and which require rights-of-way over, upon, under, or through such lands" (Section 501 [a][7]). A ROW application is required to implement the District's project to construct, operate, and maintain DCMs on public land under the jurisdiction of the BLM.

ES.3.3 CEQA OBJECTIVES

As provided in the CEQA Guidelines, public agencies are charged with the duty to avoid or minimize environmental damage where feasible. In discharging this duty, the District has an obligation to balance a variety of public objectives, including economic, environmental, and social issues (Section 15021 of the CEQA Guidelines). The findings and conclusions of the EIR regarding environmental impacts do not control the District's discretion to approve, deny, or modify the proposed project, but instead are presented as information intended to aid the decision-making process. Sections 15122 through 15132 of the CEQA Guidelines describe the required content of an EIR: a description of the project and the environmental setting (existing conditions); an analysis of the expected direct, indirect, and cumulative impacts. significant irreversible environmental changes, and growth-inducing impacts; mitigation measures to address significant impacts; alternatives; and any significant and unavoidable impacts. As a project-level EIR, this document primarily focuses on the changes in the environment that would result from construction and operation of the proposed project. The District is required to consider the information in the EIR, along with any other relevant information, in making final decisions on the proposed project as stated in Section 15121 of the CEQA Guidelines.

ES.3.4 NEPA OBJECTIVES

Under the NEPA process, the CEQ regulations for implementing NEPA require federal agencies to identify and assess reasonable alternatives to the proposed actions that will restore and enhance the quality of the human environment and avoid or minimize adverse environmental impacts. Project planning activities are required to include environmental issues and to integrate impact studies required by other environmental laws and Executive Orders into the NEPA process. The BLM must also comply with the Department of the Interior's regulations for implementing the procedural requirements of NEPA[4] in addition to the BLM's NEPA Handbook[5] in processing ROW applications.

The CEQ's regulations for implementing NEPA describe the purpose of the environmental review as "ensure(ing) that environmental information is available to public officials and citizens before decisions are made and before actions are taken."[6] In this case, the District's application for the installation, monitoring, and management of DCMs on public land managed by the BLM triggers the need for NEPA environmental review. The Bishop Field Manager will use the information contained in this EIR/EA to make a decision on whether to grant an ROW for project implementation and, if so, to grant it as requested or modified.

ES.4 ALTERNATIVES

As a result of the project formulation process, the District explored alternatives to the proposed project to assess their ability to meet most of the objectives of the project and reduce significant effects of the proposed project. Alternative projects recommended by the scoping process were evaluated as related to the project objectives and their ability to reduce significant impacts as

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[4] 43 CFR Part 46.

[5] Bureau of Land Management, 2008. National Environmental Policy Act Program. January 2008. Available at: http://www.blm.gov/pgdata/etc/medialib/blm/ak/aktest/planning/planning_general.Par.2116.File.dat/Handbook.NEPA.H-1790-1.2k8.01.30%255B1%255D.pdf

[6] 40 CFR § 1500.1 (b).

described in Section 4.0 of this EIR/EA. Six project alternatives required under CEQA have been carried forward for detailed analysis and are discussed below.

ES.4.1 Alternative 1, Dust Control Measures Applied to 214 Acres Using Irrigation Water Delivered via Water Trucks / ATVs

Alternative 1 has DCMs applied at different intensities in different areas of the Keeler Dunes, and the total acreage treated is 20 acres larger than the proposed project / proposed action. This alternative focuses on controlling the highest dust emitting areas in the un-vegetated sand dunes by applying more closely spaced straw bales and plants (95 percent control efficiency) over 140 acres. Straw bales and plants would be placed in the inter-dune sand sheet areas (74 acres) at 90 percent control efficiency. Table ES.5.1, *Alternative 1, Dust Control Measures Applied to 214 Acres Via Water Trucks / ATVs*, summarizes the acreage treated and the approximate number of plants and straw bales necessary to achieve an estimated 90 and 95 percent dust control efficiency.

TABLE ES.4.1-1
ALTERNATIVE 1, DUST CONTROL MEASURES APPLIED TO 214 ACRES VIA WATER TRUCKS / ATVS

Element	Minimum Control Efficiency	Number of Acres	Number Required per Acre	Total Number Required
Native vegetation	95 percent	140	1,983	277,620
Native vegetation	90 percent	74	1,383	102,342
Total plants				**379,962**
Straw bales*	95 percent	140	661	92,540
Straw bales	90 percent	74	461	34,114
Total straw bales				**126,654**

Note: * The dimensions of the straw bales are 0.6 x 0.4 x 1.17 meters.

Under Alternative 1, construction would be essentially the same as for the proposed project / proposed action as described in Section 2.1.5.2, *Project Elements Common to All Project / Action Alternatives*. The primary difference between the alternatives would be the total number of plants and straw bales that would be transported to the project site and distributed onto a larger area (20 additional acres) of dust control. As with the proposed project / proposed action, supplemental irrigation in the first 3 years following installation of native vegetation would be completed via hauling of water in small water tanks (about 150–200 gallons) mounted on a trailer and pulled with an ATV and then irrigation would be conducted by hand through a small diameter hose. Alternative 1 would result in a greater number of plants and straw bales; hence, additional workers and equipment may be necessary to complete the alternative in the same time frame as the proposed project / proposed action.

ES.4.2 Alternative 2, Dust Control Measures Applied to 197 Acres Using Irrigation Water Delivered via Water Trucks / ATVs

Alternative 2 has DCMs applied at different intensities in different areas of the Keeler Dunes, and the total acreage treated is 3 acres larger than the proposed project / proposed action. This alternative focuses on applying the highest intensity of dust control (95 percent control efficiency) across the Keeler Dunes and inter-dune sand sheet areas (170 acres), while applying less intensive controls on other inter-dune areas (27 acres at 90 percent dust control efficiency). Alternative 2 would control the highest dust emitting areas of the dunes by applying more closely spaced straw bales and plants at these locations. Table ES.5.2, *Alternative 2, Dust Control Measures Applied to 197 Acres.* summarizes the acreage treated and the approximate number of plants and straw bales necessary to achieve an estimated 90 and 95 percent dust control efficiency.

TABLE ES.4.2-1
ALTERNATIVE 2, DUST CONTROL MEASURES APPLIED TO 197 ACRES VIA WATER TRUCKS / ATVS

Element	Minimum Control Efficiency	Number of Acres	Number Required per Acre	Total Number Required
Native vegetation	95 percent	170	1,983	337,110
Native vegetation	90 percent	27	1,383	38,724
Total plants				**375,834**
Straw bales*	95 percent	170	661	116,997
Straw bales	90 percent	27	461	12,908
Total bales				**129,905**

Note: * The dimensions of the straw bales are 0.6 x 0.4 x 1.17 meters.

Under Alternative 2, construction would be essentially the same as for the proposed project / proposed action as described in Section 2.1.5.2, *Project Elements Common to All Project / Action Alternatives*. The primary difference between the proposed action and Alternative 2 would be the total number of plants and straw bales that would be transported to the project site and distributed onto a slightly larger area (3 additional acres). As with the proposed project / proposed action, supplemental irrigation in the first 3 years following installation of native vegetation would be completed via hauling of water in small water tanks (about 150–200 gallons) mounted on a trailer and pulled with an ATV and then irrigation would be conducted by hand through a small diameter hose.

ES.4.3 ALTERNATIVE 3, DUST CONTROL MEASURES APPLIED TO 194 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / TANKS / PVC IRRIGATION SYSTEM AND SELECTED MANUAL WATERING

Under Alternative 3, the dust control measures would be the same as the proposed project / proposed action. Water obtained from the District's production well at the Fault Test site would be transported to the site via large water trucks to temporary storage tanks located at the three of the four designated staging areas. Since the staging areas are lower in elevation than the Alternative 3 area, each staging area with a water tank would need to have a manifold and booster pump to pressurize the irrigation system. Pumps would be two to three Horse Power diesel booster pumps that would be operated during daylight hours when there is active watering of the project area. The use of water tanks mounted on ATVs, to distribute supplemental irrigation during the operations and maintenance phase of Alternative 3, would be replaced with a temporary aboveground irrigation system that would be installed within the 95-percent control level area to provide water to the Alternative 3 area. Plants within the sensitive 85-percent control area would be manually watered using the same method as described proposed project / proposed action. In the environmentally sensitive areas, the ATV mounted tanks would be filled with water from the delivery system within the Alternative 3 site instead of from trucks at the staging areas.

In Alternative 3, the temporary irrigation system would be designed such that irrigation laterals are placed every 150 feet across the Alternative 3 site, rather than extending to each straw bale. The water from the 2-inch lateral lines would be delivered to the plant locations through detachable hoses. Alternative 3 includes travel into the area by ATV to the hose attachment points along the distribution lateral lines. Watering of individual plants in the vicinity of the hose attachment points would be conducted by a worker on foot.

All travel associated with irrigation would be along the designated access routes and lateral lines. In Alternative 3, the water trucks would only be present at the staging areas during times of active watering. The water trucks would be parked off-site at night and on weekends, at the Fault Test Well site, or other existing parking or staging area in the vicinity of Owens Lake. This alternative would reduce the amount of travel in the dunes by approximately 80 percent, as compared to the proposed project/proposed action. At locations where the access route crosses irrigation lines, temporary protective covers would be placed over the piping to allow travel over the system and prevent damage to the irrigation system. There would be approximately 124 total crossings of the irrigation lines (with 62 crossings of the 2-inch distribution laterals and 62 crossings of the 4-inch transmission line). An estimated 4,500 miles of travel are required over the course of the first 3 years for watering all of the plants in the Alternative 3 area. The initial irrigation during planting would take approximately 8 weeks to complete. Each supplemental irrigation event would take approximately 5 weeks. Following the completion of each irrigation event the irrigation system would be drained of water. Each distribution lateral will have a drain valve installed. Approximately 200 gallons of water will be drained from each lateral in a manner to prevent flows off of the project area.

ES.4.4 ALTERNATIVE 4, DUST CONTROL MEASURES APPLIED TO 194 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / PVC IRRIGATION SYSTEM AND SELECTED MANUAL WATERING

Under Alternative 4, the DCMs would be the same as the proposed project / proposed action. In Alternative 4, water obtained from the Fault Test Well would be transported to the site via water trucks. The water delivery system would be fed from three supply points along SR 136. As with Alternative 3, plants within the 95-percent control area would continue to be watered with hoses attached to the laterals of the temporary PVC irrigation system. In this alternative, water trucks would stage at turnouts built near to the highway and deliver water directly in to the temporary PVC irrigation system, rather than utilizing water tanks at the staging areas for temporary storage as proposed in Alternative 3. As in Alternative 3, hand watering would be done in approximately 8 percent of the dust control area using hoses to deliver water from tanks mounted on ATVs. The ATV mounted tanks would be filled with water from the delivery system within the project instead of from tanks at the staging areas or from the trucks at the turnouts.

As in Alternative 3, in this alternative the temporary irrigation system would be designed such that distribution laterals would be placed every 150 feet across the site, rather than extending directly to each straw bale. The water from the lateral lines would be delivered to the plant locations through detachable hoses. This option includes travel into the project area from the staging areas by ATV to the hose attachment points along the lateral lines. Watering of individual plants in the vicinity of the hose attachment points would be conducted by a worker on foot. All travel associated with irrigation would be along the designated access routes and lateral lines. The ATV travel in the project in Alternative 4 is comparable to that in Alternative 3 and is approximately 80 percent as compared to the proposed project / proposed action. At locations where the access route crosses irrigation lines, temporary protective covers would be placed over the piping to allow travel over the system and prevent damage to the irrigation system. There would be approximately 124 total crossings of the irrigation lines (with 62 crossings of the 2-inch distribution laterals and 62 crossings of the 4-inch transmission line).

In Alternative 4, the water trucks would be temporarily staged at the designated turnouts during times of active watering. Three turnouts would be established along the west side of SR 136 for water truck staging. The water trucks would be parked off-site at night and on weekends, at the Fault Test Well site, or other existing parking or staging area in the vicinity of Owens Lake. Since the turnouts along SR 136 are higher in elevation than the entire dust control project, the system would be gravity fed and no booster pumps and engines would be required. Following the completion of each irrigation event the irrigation system would be drained of water. Each distribution lateral will have a drain valve installed. Approximately 200 gallons of water will be drained from each lateral in a manner to prevent flows off of the project area.

ES.4.5 Alternative 5, Dust Control Measures Applied to 194 Acres Using Irrigation Water Delivered via KCSD Water Well / Pipeline to Irrigation System and Selected Manual Watering

Under Alternative 5, the dust control measures would be the same as the proposed project / proposed action. In Alternative 5, water obtained from the KCSD well would be transported to the site via a temporary pipeline that connects into the KCSD water system near the KCSD well site. Water would be supplied directly to the temporary irrigation system from the KCSD, in lieu of the District's Fault Test well. As with Alternatives 3 and 4, Alternative 5 would include a temporary aboveground irrigation system installed within the 95-percent control level area to provide water to the project area. The irrigation system will require the use of one small electric booster pump to achieve sufficient water pressure. Plants within the 85-percent control area would be watered by hand using the same method as described above. The ATV mounted tanks would be filled with water from the delivery system within the project.

The pipeline would be routed under SR 136 using directional drilling under the existing roadway to avoid impacts to SR 136. In order to install the pipe under the SR 136, a temporary disturbance of approximately 50-feet by 50 feet on each side of the road would be required for the drilling equipment. In order to have sufficient water pressure in the irrigation system, a small 2-3 horsepower electric pump may be used near the KCSD well.

As in Alternatives 3 and 4 the temporary irrigation system would be designed such that irrigation laterals are placed every 150 feet across the site, rather than extending directly to each straw bale. The water from the lateral lines would be delivered to the plant locations through detachable hoses. This option includes travel into the Alternative 5 area by ATV from the staging areas to the hose attachment points along the lateral lines. Watering of individual plants in the vicinity of the hose attachment points will be conducted by a worker on foot. All travel associated with irrigation would be along the designated access routes and lateral lines. At locations where the access route crosses irrigation lines, temporary protective covers would be placed over the piping to allow travel over the system and prevent damage to the irrigation system. There would be approximately 124 total crossings of the irrigation lines (with 62 crossings of the 2-inch distribution laterals and 62 crossings of the 4-inch transmission line).

This option has similar mileage requirements to those in Alternatives 3 and 4 and reduces the amount of travel in the dunes by approximately 80 percent as compared to the proposed project / proposed action. Since Alternative 5 would deliver water directly to the site via a water line from the KCSD system, there would be no water trucks required to support the irrigation efforts. In the absence of water trucks, this alternative would reduce vehicle miles traveled by approximately 628 miles per year. The duration of watering events for Alternative 5 is similar to Alternatives 3 and 4 with the initial irrigation during planting taking approximately 8 weeks to complete and each supplemental irrigation event taking approximately 5 weeks. Following the completion of each irrigation event the irrigation system would be drained of water. Each distribution lateral will have a drain valve installed. Approximately 200 gallons of water will be drained from each lateral in a manner to prevent flows off of the project area.

ES.4.6 ALTERNATIVE 6, NO PROJECT / NO ACTION ALTERNATIVE

The No Action Alternative is the functional equivalent of the No Project Alternative under CEQA (CEQA Guidelines Section 15126.6(e)). Under the No Project / No Action Alternative, no DCMs would be implemented at the Keeler Dunes. During high wind events, the Keeler Dunes would continue to emit levels of windblown dust that cause and contribute to exceedances of the NAAQS and California State 24-hour standard for PM_{10} air pollution in the communities of Keeler and Swansea. In addition, under the No Project / No Action Alternative, one of the continuing dust sources in the Owens Valley Planning Area would not be remediated, contributing to noncompliance in this area and jeopardizing attainment of NAAQS for PM_{10}, as required under the 2008 SIP.

ES.5 SUMMARY OF IMPACTS

There are seven resources that are potentially of interest pursuant to CEQA that are not expected to have significant impacts resulting from implementation of the proposed project/proposed action and project/action alternatives under consideration, as documented in Section 1.12.1 of this EIR/EA; and therefore were not carried forward for detailed evaluation in this EIR/EA:

- Agriculture And Forestry Resources
- Hazards And Hazardous Materials
- Mineral Resources
- Noise
- Population And Housing
- Public Services
- Utilities And Service Systems

Eleven environmental issues defined pursuant to NEPA were carried forward for detailed analysis in this EIR/EA: aesthetics / visual resources, air quality, biological resources, cultural resources, geology and soils, greenhouse gases, hydrology and water quality, land use and planning, paleontological resources, recreation, and transportation and traffic .There are nine resources that are potentially of interest pursuant to NEPA that do not exist in the study are, as delineated in Section 1.12.2 of this EIR/EA, and therefore do not warrant analysis in the EIR/EA:

- Agricultural Land / Forestry Resources
- Essential Fish Habitat
- Farmlands, Prime or Unique

- Rangelands/Livestock Management
- Threatened and Endangered Species
- Wild and Scenic Rivers
- Wild Horses and Burros
- Wilderness Characteristics
- Wilderness and/or Wilderness Study Areas

The remaining environmental issue are carried forward for detailed analysis in this EIR / EA: aesthetics / visual resources, air quality, biological resources, cultural resources, geology and soils, paleontological resources, greenhouse gases, hydrology and water quality, land use and planning, recreation, and transportation and traffic. The analysis undertaken in support of this EIR/EA has determined that impacts to aesthetics / visual resources, air quality, biological resources, cultural resources, geology and soils, greenhouse gases, hydrology and water quality, land use and planning, paleontological resources, recreation, and transportation and traffic would not require mitigation measures as several project design elements have been incorporated into the proposed project / proposed action description to avoid the potential for significant impacts. Table ES 5-1, *Summary of Environmental Consequences*, presents impacts related to each issue area analyzed that might result or can be reasonably expected to result from implementation of the proposed project. In accordance with Section 15123 of the State CEQA Guidelines, Table ES 5.1 provides a a determination of Significance pursuant to CEQA. These determinations are not relevant to the NEPA evaluation. The BLM will make one of two determinations in light of the analysis contained in the EA, that either there is a Finding of No Significant Impact or that preparation of an environmental impact statement is warranted.

TABLE ES.5-1
SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Environmental Effects	Level of Impact / CEQA Significance Determination before Mitigation	Mitigation Measures Recommended or Required	Level of Impact / CEQA Significance Determination after Mitigation
Aesthetics			
Proposed Project / Proposed Action __Direct and Indirect Impacts__ **Construction** Construction of the proposed project / proposed action would cause temporary visual impacts on BLM lands due to the presence of equipment, materials, and workers over the course of the 11-month construction period. ATVs, semi-trucks with trailers, hay squeezes water trucks, and pickup trucks would be needed to deliver materials to the project site, and ATVs and trailers would be used within the project area and to move materials around the project site. Equipment would be visible from portions of SR 136 and adjacent roadways in the community of Keeler. Throughout the construction period, the proposed project / proposed action implementation activities would result in short-term adverse impacts to the project site. Access routes and staging areas would be prepared by brushing and grubbing, which leaves the vegetation roots intact within the ground and avoids the greater visual impact of grading. Impacts to visual resources associated with construction would be temporary because access routes and staging areas would eventually be restored with native vegetation. The visual character of the site would be altered from the existing sand sheet and bare sand dunes; however, the resulting visual character is similar to other natural dune environments. Following restoration of the access routes and staging areas, no direct impacts would occur.	MI	None	NA
Operation and Maintenance ***KOP #1 – Gathering Space at Northwestern Edge of the Community of Keeler*** The resulting visual change would be weak because the straw bales and temporary irrigation infrastructure would be barely visible and consistent with the other infrastructure that is visible from KOP 1, thereby meeting VRM Class III standards.	NI	None	NA
KOP #2 – State Route (SR) 136 Near the Southwestern Edge of the Proposed Dust Control Measures (DCMs) The resulting visual change would be weak because the straw bales and temporary irrigation infrastructure would be barely visible and consistent with the other infrastructure that is visible from KOP 2, thereby meeting VRM Class III standards.	NI	None	NA
KOP #3 – LADWP Scenic Overlook Along SR 136 The resulting visual change would be weak because the straw bales and temporary irrigation infrastructure would be barely visible and consistent with the other infrastructure that is visible from KOP 3, thereby meeting VRM Class III standards.	NI	None	NA
KOP #4 – SR 136 Near the Junction with an Existing Haul Road, Northeast of the Proposed DCMs The resulting visual change would be weak because the straw bales and temporary irrigation infrastructure would be barely visible and consistent with the other infrastructure that is visible from KOP 4, thereby meeting VRM Class III standards.	NI	None	NA
__CEQA Significance Determination__ ***Adverse Effect on a Scenic Vista*** No impact to a scenic vista would occur under CEQA during construction, operation and maintenance, or restoration of the staging areas and access routes because the project site is not visible from any designated scenic vista.	NI	None	NA
Damage Scenic Resources within a State Scenic Highway No impact to a state scenic highway would occur under CEQA during construction, operation and maintenance, or restoration of the staging areas and access routes because the project site is located over 16 miles away from the nearest designated state scenic highway and is not visible from any eligible or designated state scenic highway.	NI	None	NA
Degrade Existing Visual Character or Quality of the Site Less than significant impacts under CEQA with regard to substantially degrading the existing visual character or quality of the project site as a result of construction, operation and maintenance, or restoration of the staging areas and access routes because the project components would be consistent with the existing visual character and quality of the site: (1) the straw bales would be consistent in color, arrangement, and size to the existing native vegetation, soften over time as they are degraded and covered by blowing sand, and blend in with the existing vegetation from a distance; (2) the native vegetation is characteristic of stable dune structures in the Owens Lake area; and (3) the temporary project components (access route, staging areas, and equipment used during watering events) would be visible but compatible with the existing landscape of the proposed project site, which contains nearby water storage wells and tanks, vertical electrical transmission line poles passing through the site, vehicles including watering trucks and double rigs traveling along SR 136 and in the Owens Lake dust control area, and 10- to 15- foot high structures and mobile homes in the nearby community of Keeler.	MI	None	NA
New Source of Substantial Light or Glare No new sources of light and glare would adversely affect day or nighttime views in the area as a result of construction, operation and maintenance, or restoration of the staging areas and access routes because construction, operation and maintenance, and restoration activities would only occur during daylight hours and the project components would be non-reflective, would not emanate light, and would not be a source of glare during the daytime when sunlight is present.	NI	None	NA
Alternative 1 – Similar to Proposed Project / Proposed Action as DCMs would be applied to 20 additional acres.	MI	None	NA
Alternative 2 – Similar to Proposed Project / Proposed Action as DCMs would be applied to 3 additional acres.	MI	None	NA
Alternative 3 – More than Proposed Project / Proposed Action but less than significant because (1) dark olive green painted water storage tanks would be barely visible in less than one percent of the viewshed and are consistent with other public infrastructure in the vicinity of Owens Lake, and (2) the temporary PVC pipe irrigation system would be barely visible and could potentially produce a new source of glare during the daytime when sunlight is present below the level of significance.	MI	None	NA

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LTS = Less than Significant   PS = Potentially Significant   CC = Cumulatively Considerable   LCC = Less than Cumulatively Considerable

TABLE ES.5-1
SUMMARY OF ENVIRONMENTAL CONSEQUENCES, *CONTINUED*

Environmental Effects	Level of Impact / CEQA Significance Determination before Mitigation	Mitigation Measures Recommended or Required	Level of Impact / CEQA Significance Determination after Mitigation
Alternative 4 – More than Proposed Project / Proposed Action but less than significant because (1) the temporary PVC pipe irrigation system would be barely visible and could potentially produce a new source of glare during the daytime when sunlight is present below the level of significance and (2) the PVC trunk lines connecting the irrigation system to turnouts along SR 136 would be visible between the existing vegetation and dune topography but painted beige/tan to blend in with the surrounding landscape and would likely become partially covered by sand during the course of operation and maintenance, resulting in a less than significant impact on visual character and quality.	MI	None	NA
Alternative 5 – More than Proposed Project / Proposed Action but less than significant because (1) the temporary PVC pipe irrigation system would be barely visible and could potentially produce a new source of glare during the daytime when sunlight is present below the level of significance and (2) the PVC trunk line connecting the irrigation system to the KCSD well would be visible between the existing vegetation and dune topography but painted beige/tan to blend in with the surrounding landscape and would likely become partially covered by sand during the course of operation and maintenance, resulting in a less than significant impact on visual character and quality.	MI	None	NA
Alternative 6 – No new development is proposed under the No Project / No Action Project Alternative. The existing impacts of dust on aesthetics would not be alleviated because DCMs would not be implemented.	MI	None	NA
Air Quality			
Proposed Project / Proposed Action			
<u>**Direct and Indirect Impacts**</u>			
Construction Due to the fact that emissions of PM_{10} would be expected to be below the *de minimis* threshold and that the overall purpose of the project is to reduce PM_{10} emissions, the project would not be subject to a conformity determination. The project generates *de minimis* levels of criteria pollutants from daily regional construction emissions. The annual regional construction emissions associated with construction would not be expected to exceed the U.S. EPA *de minimis* threshold for PM_{10}.	MI/LTS	None	N/A
Operation and Maintenance Operational air emissions at the proposed project / proposed action property are likely to result from mobile sources due to monitoring activities and annual watering, as needed. The estimated daily operational emissions of PM_{10} for the monitoring phase of the proposed project / proposed action including mobile-source emissions due to employee commute trips would be below the U.S. EPA *de minimis* thresholds. The annual operational emissions of PM_{10} for the monitoring phase of the proposed project / proposed action would be below the U.S. EPA *de minimis* thresholds. Due to the low number of vehicle trips anticipated for the proposed project / proposed action (8–10 per day), there would be no substantial increase in carbon monoxide (CO) concentrations at sensitive receptor locations. **).** Toxic air contaminants (TACs) impacts at the proposed project / proposed action property would result primarily from diesel particulate emissions associated with heavy-duty equipment operations. the number of heavy-duty delivery trucks accessing the proposed project / proposed action property on a daily basis would be minimal, and the proposed project / proposed action area is remote and largely unpopulated; therefore, TAC emissions would not occur in large concentrations in populated areas and would be minor in nature and duration and would not adversely affect human health. The construction and operations and maintenance phases of the proposed project / proposed action would not generate area-source emissions that would be expected to impair visibility.	MI/LTS	None	N/A
<u>**CEQA Significance Determination**</u>			
Conflict with Air Quality Plan The proposed project / proposed action would not have any impact related to conflicts with the applicable air quality plan, the 2008 Owens Valley PM_{10} Demonstration of Attainment State Implementation Plan. The proposed project has been designed to facilitate implementation of elements of the plan related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS.	BI	None	N/A
Violate Air Quality Standard The proposed project / proposed action would not have any significant impact to air quality related to a violation of an air quality standard or contribution to an existing or projected air violation. The proposed project has been designed to facilitate implementation of elements of the 2008 Owens Valley PM_{10} Demonstration of Attainment State Implementation Plan related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS.	BI	None	N/A
Cumulatively Considerable Net Increase The proposed project / proposed action would not contribute to a cumulatively considerable net increase in any criteria pollutant for which the project region is non-attainment. The OVPA is non-attainment for PM_{10} emissions. The proposed project has been designed to facilitate implementation of elements of the 2008 SIP related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS	BI/LCC	None	N/A
Expose Sensitive Receptors The proposed project / proposed action would result in less than significant impacts to air quality as a result of exposure of sensitive receptors to substantial pollutant concentrations of carbon monoxide, toxic air contaminants, or visibility-reducing particles. Implementation of the proposed project would have a net benefit in relation to reduction of exposure of sensitive receptors in the communities of Keeler and Swansea.	NI	None	N/A
Create Objectionable Odors The proposed project / proposed action would result in less than significant impacts to air quality related to the creation of objectionable odors. The proposed project is located approximately 0.5 mile away from the nearest population, the community of Keeler. Construction emissions would be expected to be confined within ¼ mile of the construction site, and be limited in duration due to the less than one year construction period and relatively low levels of equipment required.	NI	None	N/A
Alternative 1 – Similar as Proposed Project / Proposed Action as DCMs would be applied to 20 additional acres.	LTS	None	N/A
Alternative 2 – Similar as Proposed Project / Proposed Action as DCMs would be applied to 3 additional acres.	LTS	None	N/A
	LTS	None	N/A

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TABLE ES.5-1
SUMMARY OF ENVIRONMENTAL CONSEQUENCES, *CONTINUED*

Environmental Effects	Level of Impact / CEQA Significance Determination before Mitigation	Mitigation Measures Recommended or Required	Level of Impact / CEQA Significance Determination after Mitigation
Alternative 3 – Less than Proposed Project / Proposed Action as ATV trips would be reduced by 80%.	LTS	None	N/A
Alternative 4 – Less than Proposed Project / Proposed Action as ATV trips would be reduced by 80%.	LTS	None	N/A
Alternative 5 – Less than Proposed Project / Proposed Action as ATV trips would be reduced by 80% and no water trucks would be required.	IE	None	N/A
Alternative 6 – No new development is proposed under the No Project / No Action Project Alternative. No air quality impacts would occur under CEQA; however, the No Project / No Action Alternative does not accomplish the proposed project / proposed action's goals and objectives for reducing PM_{10} emissions to meet NAAQS and California state standards.			
Biological Resources			
Proposed Project / Proposed Action			
<u>Direct and Indirect Impacts</u>			
Construction			
Construction of the proposed project / proposed action would have no effect on state-designated sensitive habitats; no expected impacts to rare, threatened, or endangered species pursuant to the Federal ESA and California ESA; no expected impacts to sensitive species designated as species of special concern by the CDFW or designated as sensitive species by the BLM; no expected impacts to locally important species; no expected impacts to federally protected wetlands pursuant to Section 404 of the CWA; no expected impacts to migratory routes or nursery sites; no expected impacts to local policies related to threatened or endangered species; no effect on an adopted Habitat Conservation Plan and/or Natural Community Conservation Plan.	NI/LCC	None	N/A
Operation and Maintenance			
Operation and maintenance of the proposed project / proposed action would have no effect on state-designated sensitive habitats; no expected impacts to rare, threatened, or endangered species pursuant to the Federal ESA and California ESA; no expected impacts to sensitive species designated as species of special concern by the CDFW or designated as sensitive species by the BLM; no expected impacts to locally important species; no expected impacts to federally protected wetlands pursuant to Section 404 of the CWA; no expected impacts to migratory routes or nursery sites; no expected impacts to local policies related to threatened or endangered species; no effect on an adopted Habitat Conservation Plan and/or Natural Community Conservation Plan.	NI/LCC	None	N/A
<u>CEQA Significance Determination</u>			
Candidate, Sensitive, Or Special Status Species			
The proposed project / proposed action would not have a substantial adverse effect on candidate, sensitive or special status species. Several sensitive species, including the Owens dune weevil, was found to be present at the proposed project / proposed action study area due to direct observation, historical observation or presence of suitable habitat. However, due to the nature of proposed project / proposed action, impacts are not expected to measurably affect the species.	NI/LCC	None	N/A
Riparian Habitat Or Other Sensitive Natural Community			
The proposed project / proposed action would not be expected to result in impacts to riparian habitat or other sensitive natural community. Biological resource surveys conducted at the proposed project / proposed action study area did not identify any state-designated sensitive habitats on site or in immediately adjacent areas.	NI/LCC	None	N/A
Protected Wetlands			
The proposed project / proposed action would not be expected to result in impacts to federally protected wetlands pursuant to Section 404 of the Clean Water Act. Biological resources surveys conducted at the proposed project / proposed action study area did not identify any protected wetlands.	NI/LCC	None	N/A
Migratory Fish Or Wildlife Species, Wildlife Corridors			
The proposed project / proposed action would not be expected to result in impacts to known migratory routes or nursery sites. Biological resources surveys conducted at the proposed project / proposed action study area did not identify any migratory corridors or nursery sites on site or in adjacent areas.	NI/LCC	None	N/A
Local Policies Protecting Biological Resources			
The proposed project / proposed action would not conflict with local policies or ordinances. A review of the Bishop Resource Management Plan, Inyo County General Plan, and Lower Owens River Project Plan did not identify any conflicts resulting from the proposed project / proposed action.	NI/LCC	None	N/A
Habitat Conservation Plan			
The proposed project / proposed action would not conflict with an adopted HCP or NCCP, or other approved state, local, or regional plan. The proposed project study area is not located within the boundaries of an HCP area, NCCP area, or any other planning area designated by any local, regional, or state agency.	NI/LCC	None	N/A
Alternative 1 - Same as would occur for the proposed project / proposed action.	NI/LCC	None	N/A
Alternative 2 - Same as would occur for the proposed project / proposed action.	NI/LCC	None	N/A
Alternative 3 - Same as would occur for the proposed project / proposed action.	NI/LCC	None	N/A
Alternative 4 - Same as would occur for the proposed project / proposed action.	NI/LCC	None	N/A
Alternative 5 - Same as would occur for the proposed project / proposed action.	NI/LCC	None	N/A
Alternative 6 - No effect on biological resources would occur as the proposed project / proposed action would not be implemented.	NI/LCC	None	N/A

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TABLE ES.5-1
SUMMARY OF ENVIRONMENTAL CONSEQUENCES, *CONTINUED*

Environmental Effects	Level of Impact / CEQA Significance Determination before Mitigation	Mitigation Measures Recommended or Required	Level of Impact / CEQA Significance Determination after Mitigation
Cultural Resources			
Proposed Project / Proposed Action			
Direct and Indirect Impacts			
Construction Construction and maintenance of the proposed project / proposed action has been designed to avoid adverse effects to significant cultural resources that may be present within the proposed project / proposed action area. The portions of CA-INY-6502 and KD Site 1 located within the APE primarily fall within the area designated for 85 percent dust control efficiency. The DCM in these areas will be the planting of native vegetation and the placement of straw bales that will act as wind breaks within active dune areas. These materials will be transported to the vicinity of the area using all-terrain vehicles along a temporary access route that will be located north of CA-INY-6502. No vehicular traffic shall occur within the site boundaries. The vegetation and straw bales will be hand-carried along designated footpaths to their respective planting areas in active dune areas. The planting of vegetation will involve the hand excavation of small holes (less than 1 foot in depth) for the placement of individual plants. The plants will be clustered in groups of three along the base of each straw bale. The 85 percent dust control efficiency that would be implemented during the proposed project / proposed action allows some flexibility in the locations of the straw bales and associated plants. As such, areas within CA-INY-6502 and KD Site1 that contain culturally sensitive deposits can be avoided under the proposed project / proposed action. These areas tend to be located in deflated areas between the active dunes where cultural deposits have been exposed by moving sands. Several additional efforts have been incorporated into the proposed project / proposed action to avoid adverse effects to significant cultural deposits within the proposed project / proposed action area. To ensure that no cultural deposits are adversely affected by the transport and placement of the vegetation and straw bales, a qualified archaeologist will undertake an intensive surface survey of the APE, using special consideration for the portions of CA-INY-6502 and KD Site1 falling within the APE, prior to the initiation of construction activities with a Native American monitor present. This work will involve the identification and recording of identified artifacts and features, including those previously identified within the site boundary of CA-INY-6502 and KD Site1 and any newly identified cultural deposits within the APE, using handheld GPS units. A spatial analysis in GIS will then be undertaken to determine the specific placement of vegetation, straw bales, and foot paths within the site boundary of CA-INY-6502 and KD Site1, as well as any other identified cultural deposits within the APE, in order to avoid impacts to significant cultural deposits. Prior to the initiation of ground-disturbing activities, the District shall submit a final proposed construction scenario to the BLM for approval that depicts the location of these proposed project / proposed action elements and their relation to surface artifacts and features.	MI/LTS	None	N/A
Operation and Maintenance Same impacts as with Construction.	MI/LTS	None	N/A
CEQA Significance Determination			
Historical Resource Significance The proposed project APE includes a total of 22 cultural resources, two of which are archaeological resources (CA-INY-6502 and KD Site 1) that have been identified as eligible for listing on the NRHP and CRHR, and thereby are considered significant "historical resources" under CEQA. The three remaining cultural resources (CA-INY-6513H, KD Site 2, BLM Site 1, and 17 archaeological isolates [BLM]) are not considered eligible for listing on the NRHP or CRHR and, therefore, do not fit the definition of a "historical resource" under CEQA. The proposed project has been designed to avoid impacts to significant cultural deposits associated with the two historic resources (see *Cultural Resources Protection* in Section 2.0). As a result of the implementation of these avoidance measures, the construction and operation of the proposed project would not be expected to cause "a substantial adverse change" in the "significance" of the two (CA-INY-6502 and KD site 1) historical resources.	MI/LTS	None	N/A
Archaeological Resource Significance The proposed project APE includes a total of twenty-two cultural resources, two of which are archaeological resources (CA-INY-6502 and KD Site 1) that have been identified as eligible for listing on the NRHP and CRHR, and thereby are considered "significant archaeological resource" under CEQA. The remaining cultural resources (CA-INY-6513H and, KD Site 2, BLM Site 1, and seventeen archaeological isolates [BLM]) are not considered eligible for listing on the NRHP or CRHR, and therefore do not fit the definition of a "significant archaeological resources" under CEQA. The proposed project has been designed to avoid impacts to significant cultural deposits associated with these eligible resources (see Cultural Resources Protection in Section 2.0). As a result of the implementation of these avoidance measures, the construction and operation of the proposed project would not be expected to cause "a substantial adverse change" in the "significance" of these eligible archaeological sites (CA-INY-6502 and KD Site 1).	MI/LTS	None	N/A
Human Remains The site of CA-INY-6502 is part of a larger mortuary complex containing multiple prehistoric and possibly historic period burial features that include human remains. The proposed project has been designed to avoid impacts to these significant cultural deposits, including human remains, at this archaeological site (see *Cultural Resources Protection* in Section 2.0). As a result of the implementation of these avoidance measures, the construction and operation of the proposed project would not be expected to adversely impact human remains or any other significant cultural deposits at CA-INY-6502.	NI	None	N/A
Alternative 1 – Similar as Proposed Project / Proposed Action as DCMs would be applied to 20 additional acres.	MI/LTS	None	N/A
Alternative 2 – Similar as Proposed Project / Proposed Action as DCMs would be applied to 3 additional acres.	MI/LTS	None	N/A
Alternative 3 – Similar as Proposed Project / Proposed Action as a temporary irrigation system would be utilized, however the culturally sensitive areas would still be manually watered.	MI/LTS	None	N/A
Alternative 4 – Similar as Proposed Project / Proposed Action as a temporary irrigation system would be utilized, however the culturally sensitive areas would still be manually watered.	MI/LTS	None	N/A
Alternative 5 – Similar as Proposed Project / Proposed Action as a temporary irrigation system would be utilized, however the culturally sensitive areas would still be manually watered.	MI/LTS	None	N/A
Alternative 6 – No new development is proposed under the No Project / No Action Project Alternative. No cultural resources impacts would occur under CEQA.	NI	None	N/A

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TABLE ES.5-1
SUMMARY OF ENVIRONMENTAL CONSEQUENCES, *CONTINUED*

Environmental Effects	Level of Impact / CEQA Significance Determination before Mitigation	Mitigation Measures Recommended or Required	Level of Impact / CEQA Significance Determination after Mitigation
Geology and Soils			
Proposed Project / Proposed Action **Direct and Indirect Impacts** **Construction** The proposed project / proposed action would not involve construction of any type of building; therefore, there would be no exposure of buildings to surface fault ruptures that would expose people or structures to potential substantial adverse effects. Therefore, the proposed project / proposed action would not be expected to result in significant impacts to geology and soils related to the risk of exposure to surface fault rupture. The proposed project / proposed action does not include structures or the addition of a permanent or regular population on site. Therefore, the proposed project / proposed action would not expose people or structures to potential substantial adverse effects related to strong seismic ground shaking. Since habitable structures will not be built as part of the proposed project / proposed action, people or structures will not be exposed to adverse effects involving seismic-related ground failure, including liquefaction. Inyo County is not delineated as a seismic hazard zone, which includes areas prone to landslides by the CGS under the SHZP. Therefore, the proposed project / proposed action would not result in an impact from landslides. The proposed project / proposed action would not result in significant impacts from soil erosion. The proposed project / proposed action does not include plans for septic tanks or alternative waste water disposal systems; therefore, there is no impact on the ability of soils to adequately support the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.	NI	None	N/A
Operation and Maintenance Same impacts as with Construction.	NI	None	N/A
CEQA Significance Determination ***Surface Fault Rupture*** The proposed project / proposed action would not be expected to result in significant impacts related to surface fault rupture. Faults are the planes along which earthquakes occur. Where earthquakes are large enough, or shallow enough, surface rupture can occur along the fault plane where it intersects the earth's surface. Geophysical surveys have revealed numerous fault strands on the bed of Owens Lake, with most roughly following a northwest-southeast trend. The proposed project study area is not delineated by the California Geological Survey as an APEFZ. There are no documented fault scarps in the proposed project study area. The proposed project would not involve construction of any type of building; therefore, there would be no exposure of buildings to surface fault ruptures that would expose people or structures to potential substantial adverse effects. Therefore, the proposed project would not be expected to result in significant impacts to geology and soils related to the risk of exposure to surface fault rupture.	NI	None	N/A
Seismic Ground Shaking The proposed project would not be expected to result in significant impacts from strong seismic ground shaking. All of California is at risk from seismic ground shaking and the Sierra Nevada and Owens Valley Fault Zones are both capable of generating earthquakes with a magnitude of 8.0 or greater. The proposed project study area is not delineated by the California Geological Survey as an APEFZ. The proposed project study area is not delineated by the California Geological Survey under the SHZP. The proposed project does not include structures or the addition of a permanent or regular population on site. Therefore, the proposed project would not expose people or structures to potential substantial adverse effects related to strong seismic ground shaking.	NI	None	N/A
Seismic-Related Ground Failure The proposed project / proposed action would not be expected to result in significant impacts from seismic related ground failure, including liquefaction. Liquefaction occurs when saturated, cohesionless (low relative density) materials (usually sand or silty sand) are transformed from a solid to a near liquid state due to the increase in pore water pressure that can be caused by moderate to severe seismic ground shaking. The depth to groundwater in the proposed project study area ranges from approximately 196 feet on the eastern border, east of SR 136, to within a few feet of the surface along the southwestern study area border. The soils in the proposed project study area vary from loose gravels and sands to compact clays. The conditions for liquefaction may be present along the historic shoreline, in the extreme southern portion of the proposed project study area where the soils are finer texture and the groundwater is close to the surface. Due to the presence of coarse alluvial material over most of the rest of the proposed project study area and the overall depth of the groundwater, the conditions for liquefaction over the rest of the proposed project / proposed actionstudy area is considered to be low. In addition, the proposed project does not expose people or structures to potential substantial adverse effects involving strong seismic-related ground failure, including liquefaction. Since habitable structures will not be built as part of the proposed project, people or structures will not be exposed to adverse effects involving seismic-related ground failure, including liquefaction.	NI	None	N/A
Landslides The proposed project / proposed action would not result in significant impacts from seismically induced landslides. The proposed project / proposed action will not be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the proposed project / proposed action, potentially resulting in on- or off-site landslides or lateral spreading. The proposed project / proposed action site is located well away from the Sierra Nevada and Inyo Mountain fronts which have slopes steep enough to initiate a landslide during seismic events. Additionally, since habitable structures will not be built as part of the proposed project / proposed action, people will not be exposed to adverse effects involving landslides. Inyo County is not delineated as a seismic hazard zone, which includes areas prone to landslides by the CGS under the SHZP. Therefore, the proposed project / proposed action would not result in an impact from landslides.	NI	None	N/A
Soil Erosion Within the proposed project / proposed action study area, wind and water erosion are ongoing processes. The proposed project / proposed action would not be expected to result in significant impacts related to a substantial increase in soil erosion or loss of topsoil beyond that that occurs in the existing condition. As evidenced by stable dune systems at other locations around the edge of Owens Lake, the proposed project / proposed action is designed to produce a net increase in vegetative cover and resulting stabilization of the dunes, resulting in a net decrease in the susceptibility to wind erosion. The objective of the proposed project / proposed action is to stabilize the dunes and reduce the levels of windblown dust and prevent erosion, that are causing and contributing to exceedances of federal and state standards for PM_{10} air pollution. Construction activity associated with the proposed project / proposed action includes site preparation and preparation of the staging areas and temporary access routes (temporary disturbance of approximately 33.5 acres), placing the straw bales, planting the native vegetation, and watering activities. This impact is considered short-term in nature since the potential for significant impact will end after construction is finished due to the placement of straw bales and vegetation. As specified in the proposed project / proposed action description, the proposed project / proposed action will comply with all	MI/LTS	None	N/A

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Environmental Effects	Level of Impact / CEQA Significance Determination before Mitigation	Mitigation Measures Recommended or Required	Level of Impact / CEQA Significance Determination after Mitigation
provisions of the NPDES Program administered by the California RWQCB, Lahontan Region, as they relate to avoiding impacts from storm water runoff during construction, including preparation of a SWPPP, which shall be prepared in accordance with the California State Water Resources Control Board Order No. 99-08—DWQ, NPDES General Permit No. CAS000002 (General Construction Permit) prior to the start of soil-disturbing activities. In addition, the construction contractor would be required to incorporate BMPs consistent with the guidelines provided in the *California Storm Water Quality Handbook: Construction Site Best Management Practices Manual*. Therefore, the proposed project / proposed action would not result in significant impacts from soil erosion.			
Stability of Geology and Soil / Expansive Soils The proposed project / proposed action would not result in significant impacts related to the location of the proposed project / proposed action on a geologic unit that is unstable or that would become unstable as a result of the proposed project / proposed action. The proposed project / proposed action does not include the addition of habitable structures which would be impacted by unstable geology. The proposed project / proposed action would not result in significant impacts from an unstable geology unit. The proposed project / proposed action does not include plans for septic tanks or alternative waste water disposal systems; therefore, there is no impact on the ability of soils to adequately support the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.	NI	None	N/A
Alternative 1 - Same as would occur for the proposed project / proposed action.	NI	None	N/A
Alternative 2 - Same as would occur for the proposed project / proposed action.	NI	None	N/A
Alternative 3 - Same as would occur for the proposed project / proposed action with an 80 percent reduction in ATV trips than the proposed project / proposed action.	NI	None	N/A
Alternative 4 - Same as would occur for the proposed project / proposed action with an 80 percent reduction in ATV trips than the proposed project / proposed action.	NI	None	N/A
Alternative 5 - Same as would occur for the proposed project / proposed action with an 80 percent reduction in ATV trips than the proposed project / proposed action, and the elimination of vehicle miles traveled for water trucks.	NI	None	N/A
Alternative 6 - No effect on geology and soils would occur as the proposed project / proposed action would not be implemented.	NI	None	N/A
Greenhouse Gases			
Proposed Project / Proposed Action			
<u>Direct and Indirect Impacts</u>			
Construction Based on emissions modeling, construction activities would result in the emission of a maximum of approximately 3,668.47 metric tons of CO_{2e} per year.	LTS	None	N/A
Operation and Maintenance Operation of the proposed project / proposed action would not be expected to have a significant detrimental impact upon GHG emissions and would reduce GHG emissions in compliance with the goals of AB 32 by providing an additional sink for CO_{2e}, which would reduce GHG emissions compared to a business as usual scenario. Operation of the proposed project / proposed action would result in the emission of approximately 1,869.48 metric tons of CO_{2e} per year.	LTS	None	N/A
<u>CEQA Significance Determination</u>			
Generate GHG Emissions The proposed project / proposed action would not result in a significant impact on the environment through the generation of GHG emissions. With the exception of minor emissions associated with construction activities, the proposed project would reduce GHG emissions through sequestration of GHG by the native plants	MI/LTS	None	N/A
Control With an Applicable Plan The proposed project / proposed action would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. The proposed project would reduce GHG emissions in compliance with the goals of AB 32.	BI	None	N/A
Alternative 1 – Similar as Proposed Project / Proposed Action as DCMs would be applied to 20 additional acres.	LTS	None	N/A
Alternative 2 – Similar as Proposed Project / Proposed Action as DCMs would be applied to 3 additional acres.	LTS	None	N/A
Alternative 3 – Less than Proposed Project / Proposed Action as ATV trips would be reduced by 80%.	LTS	None	N/A
Alternative 4 – Less than Proposed Project / Proposed Action as ATV trips would be reduced by 80%.	LTS	None	N/A
Alternative 5 – Less than Proposed Project / Proposed Action as ATV trips would be reduced by 80% and no water trucks would be required.	LTS	None	N/A
Alternative 6 – No new development is proposed under the No Project / No Action Project Alternative. No GHG impacts would occur under CEQA.	LTS	None	N/A
Hydrology and Water Quality			
Proposed Project / Proposed Action			
<u>Direct and Indirect Impacts</u>			
Construction The proposed project would not include any perennial water bodies within the proposed project limits nor does it would not involve demolition activities or building of any permanent structures or impervious surfaces. The proposed project would include minimal grading and the use of construction vehicles. The existing site surface grade and drainage would be retained as part of the proposed project. Soil erosion, sedimentation, and runoff (e.g. runoff containing grease, oil, sediment and heavy metals) shall be controlled during construction in accordance with an NPDES Construction General Permit, approved SWPPP and associated BMPs. The District has also identified BMPs to reduce the potential for fuel spills and transport of pollutant runoff with the development of approved HMBP and SPCC. The site is not within a 100-year flood zone area and is not subject to flooding. Due to the low surface gradient and the distance from the ocean and other water bodies, the proposed project is not subject to inundation by seiche,	LTS	None	N/A

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Environmental Effects	Level of Impact / CEQA Significance Determination before Mitigation	Mitigation Measures Recommended or Required	Level of Impact / CEQA Significance Determination after Mitigation
tsunami, or mudflow. Therefore, less than significant impacts under CEQA would occur relative to surface water quality, drainage, groundwater, 100-year flood zone, or seiche, tsunami, or mudflow.			
Operation and Maintenance The proposed project has been designed to require minimal maintenance. Operational activities would include operation and maintenance of the air quality monitoring stations, supplemental watering and monitoring of plant growth and straw bale condition, and activities associated with the replacement of broken bales and dead plants. The proposed project elements have been designed to avoid active and inactive blue line drainages, with the exception of limited crossing by rubber-tired vehicles. The staging areas and access routes that have been designed as elements of the proposed project/proposed project have been designed to minimize disturbance. Sufficient groundwater exists for use by the proposed project for the watering of the native vegetation from the District's Fault Test well. Groundwater used for watering would not leave the Owen Lake Hydrological Basin. Therefore, less than significant impacts under CEQA would occur relative to surface water quality, drainage, and groundwater.	LTS	None	N/A
<u>**CEQA Significance Determination**</u>			
Water Quality Standards The proposed project / proposed action would not be expected to result in significant impacts to hydrology and water quality with the incorporation of the SWPPP, HMBP, and SPCCC in into the proposed project / proposed action design. There are no perennial surface water bodies in the proposed project / proposed action site. The proposed project / proposed action would not involve demolition activities or building of any permanent structures or impervious surfaces that could affect surface water quality.	LTS	None	N/A
Groundwater The proposed project / proposed action's daily water demand during proposed project / proposed action implementation would not result in drawdown of the water table. The proposed project / proposed action would not create impervious surfaces or otherwise affect the recharge of the proposed project / proposed action property. There would be no temporary or permanent structures proposed that would alter groundwater flow or recharge and no dewatering activities would be required as part of the proposed project / proposed action.	NI	None	N/A
Drainage Patterns There are two blue line drainages shown within the study area. The proposed has been designed to avoid the one still active blue-line drainage within the proposed project / proposed action area. There would be no installation of straw bales or native plants within the ephemeral drainage. The proposed project / proposed action does not entail the construction of any impervious areas or structures that would affect drainage patterns.	NI	None	N/A
Runoff The proposed project would not create any impervious surfaces; therefore there would be no anticipated increase of runoff water; therefore, there would be no anticipated significant impacts to existing or planned storm water drainage systems. The District has required, as an element of the proposed project, the control of erosion, sedimentation and runoff (e.g. runoff containing grease, oils, sediment, and heavy metals during construction in accordance with an NPDES Construction General Permit, SWPPP and associated BMPs.	NI	None	N/A
Otherwise substantially degrade water quality The District has required, as an element of the proposed project, the control of erosion, sedimentation and runoff (e.g. runoff containing grease, oils, sediment, and heavy metals during construction in accordance with an NPDES Construction General Permit, SWPPP and associated BMPs; therefore, the proposed project would not expected to otherwise substantially degrade water quality.	NI	None	N/A
100-year Flood Hazard Not Applicable	N/A	None	N/A
Flooding Risk Not Applicable	NA	None	N/A
Seiche, Tsunami, or Mudflow The proposed project would not include any perennial water bodies within the proposed project limits nor does it would not involve demolition activities or building of any permanent structures or impervious surfaces. The proposed project would include minimal grading and the use of construction vehicles. The existing site surface grade and drainage would be retained as part of the proposed project. Soil erosion, sedimentation, and runoff (e.g. runoff containing grease, oil, sediment and heavy metals) shall be controlled during construction in accordance with an NPDES Construction General Permit, approved SWPPP and associated BMPs. The District has also identified BMPs to reduce the potential for fuel spills and transport of pollutant runoff with the development of approved HMBP and SPCC. The site is not within a 100-year flood zone area and is not subject to flooding. Due to the low surface gradient and the distance from the ocean and other water bodies, the proposed project is not subject to inundation by seiche, tsunami, or mudflow. Therefore, less than significant impacts under CEQA would occur relative to surface water quality, drainage, groundwater, 100-year flood zone, or seiche, tsunami, or mudflow	LTS	None	N/A
Alternative 1 – Same as would occur for the proposed project / proposed action.	LTS	None	N/A
Alternative 2 – Same as would occur for the proposed project / proposed action.	LTS	None	N/A
Alternative 3 – Same as would occur for the proposed project / proposed action.	LTS	None	N/A
Alternative 4 – Same as would occur for the proposed project / proposed action.	LTS	None	N/A
Alternative 5 – Same as would occur for the proposed project / proposed action.	LTS	None	N/A
Alternative 6 – No effect on hydrology would occur as the proposed project / proposed action would not be implemented.	LTS	None	N/A

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LTS = Less than Significant; PS = Potentially Significant; CC = Cumulatively Considerable; LCC = Less than Cumulatively Considerable

TABLE ES.5-1
SUMMARY OF ENVIRONMENTAL CONSEQUENCES, *CONTINUED*

Environmental Effects	Level of Impact / CEQA Significance Determination before Mitigation	Mitigation Measures Recommended or Required	Level of Impact / CEQA Significance Determination after Mitigation
Land Use and Planning			
Proposed Project / Proposed Action __Direct and Indirect Impacts__ **Construction** Construction of the proposed project / proposed action would not result in direct or indirect impacts to land use and planning because the proposed DCMs would be located at least 1 mile away from the nearest established community, maintain the current open space pursuant to applicable land use plans, and the project site is not included in any habitat conservation plan or natural community conservation plan. Additionally, the proposed project / proposed action would not restrict access or maintenance activities to the existing right-of-ways held by Verizon, LADWP, or Caltrans.	NI	None	NA
Operation and Maintenance Construction of the proposed project / proposed action would not result in direct or indirect impacts to land use and planning because the proposed DCMs would be located at least 1 mile away from the nearest established community, maintain the current open space with low-impact recreational use pursuant to applicable land use plans, and the project site is not included in any habitat conservation plan or natural community conservation plan. Additionally, the proposed project / proposed action would not restrict access or maintenance activities to the existing right-of-ways held by Verizon, LADWP, or Caltrans.	NI	None	NA
__CEQA Significance Determination__ ***Physically Divide an Established Community*** The proposed project / proposed action would not impact an established community because all of the DCMs would be implemented at a distance of at least one mile away from the communities within the vicinity of the project site.	NI	None	NA
Conflict with Applicable Land Use Plans, Policies, or Regulations The proposed project / proposed action would not impact applicable land use plans, policies, or regulation because the proposed DCMs would be consistent with the Federal Land Policy and Management Act of 1976, the Inyo County General Plan, Inyo County Zoning Ordinance, Lower Owens River Project, Owens Valley Management Plan, Owens Lake Master Project, and other applicable local plans. The proposed project would maintain the current open space and support the preservation of natural resources while maintaining low-impact recreational opportunities.	NI	None	NA
Conflict with Applicable Habitat Conservation Plan or Natural Community Conservation Plan The proposed project / proposed action would not result in impacts related to any applicable Habitat Conservation Plan (HCP) or Natural Community Conservation Plan (NCCP) because no portion of the project site is included in any applicable HCP or NCCP. The Lower Owens River Project EIR discusses the potential to create an HCP for federally listed species with the potential to occur within the area of the Lower Owens River Project covered in the Draft EIR; however, the goals and objectives of the Draft EIR and any potential HCP that may result would not conflict with the proposed project / proposed action.	NI	None	NA
Alternative 1 – Same as Proposed Project / Proposed Action.	NI	None	NA
Alternative 2 – Same as Proposed Project / Proposed Action.	NI	None	NA
Alternative 3 – Same as Proposed Project / Proposed Action.	NI	None	NA
Alternative 4 – Same as Proposed Project / Proposed Action.	NI	None	NA
Alternative 5 – Same as Proposed Project / Proposed Action.	NI	None	NA
Alternative 6 – No new development is proposed under the No Project / No Action Project Alternative. No land use impacts would occur under CEQA.	NI	None	NA
Paleontological Resources			
Proposed Project / Proposed Action __Direct and Indirect Impacts__ **Construction** Direct and indirect impacts to paleontological resources resulting from the proposed project / proposed action would be expected to be minimal. Straw bales placement and the planting and establishment of native vegetation will be conducted with minimal ground disturbance from vehicle and foot traffic in the immediate area and would be implemented on modern active sand deposits that have a minimum potential for containing paleontological resources. These disturbances are expected to disturb the ground surface and uppermost layers of soil only. Direct impacts from the preparation of four staging areas may result from minimal disturbance of the ground surface for each staging area. Indirect impacts from staging area preparation may result from increased vehicle and foot traffic.	NI	None	N/A
Operation and Maintenance Same impacts as construction.	NI	None	N/A
__CEQA Significance Determination__ ***Unique Paleontological Resource/Unique Geologic Feature*** The proposed project would not be expected to result in significant impacts related directly or indirectly to the destruction of a unique paleontological resource or unique geologic feature. The proposed project area is located within an area of surficial aeolian sediments consisting of active sand sheets and sand dunes interspersed with smaller surficial deposits of Quaternary alluvium. Given that the geologic units within the project area exhibit a Class 2 – Low sensitivity, the placement of straw bales and the use of temporary access routes as well as shallow excavations associated with the planting of vegetation would have little potential of encountering fossil remains. A small portion of the proposed project area, which includes Staging Areas 1 and 2 and the central and southern access routes, is situated within Class 2 – Low sensitivity surficial aeolian sediments consisting of active sand sheets and sand dunes interspersed with smaller surficial deposits of quaternary alluvium that overlay Class 4 – High sensitivity lacustrine sediments. However, due to shifting nature of the dune sands, some portions of the proposed project may have Class 4 - High sensitivity lacustrine sediments at shallow depths, less than one foot. The proposed project is not anticipated to result in significant impacts	NI	None	N/A

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LTS = Less than Significant PS = Potentially Significant CC = Cumulatively Considerable LCC = Less than Cumulatively Considerable

Environmental Effects	Level of Impact / CEQA Significance Determination before Mitigation	Mitigation Measures Recommended or Required	Level of Impact / CEQA Significance Determination after Mitigation
to these geological deposits.			
Alternative 1 – Similar as Proposed Project / Proposed Action as DCMs would be applied to 20 additional acres.	NI	None	N/A
Alternative 2 – Similar as Proposed Project / Proposed Action as DCMs would be applied to 3 additional acres.	NI	None	N/A
Alternative 3 – Similar as Proposed Project / Proposed Action as a temporary irrigation system would be utilized.	NI	None	N/A
Alternative 4 – Similar as Proposed Project / Proposed Action as a temporary irrigation system would be utilized.	NI	None	N/A
Alternative 5 – Similar as Proposed Project / Proposed Action as a temporary irrigation system would be utilized.	NI	None	N/A
Alternative 6 – No new development is proposed under the No Project / No Action Project Alternative. No paleontological resources impacts would occur under CEQA.	NI	None	N/A
Recreation			
Proposed Project / Proposed Action			
Direct and Indirect Impacts			
Construction Construction of the proposed project / proposed action would not result in any significant direct impacts to recreation because it would not require closure or restrict access on any roads or walkways that provide access to the Keeler Dunes by Keeler residents. Temporary restrictions with regard to passive recreation on the 194 acres of active construction of the Keeler Dunes may result in a increase in use to recreational facilities within a 15-mile radius of the project site, but these facilities have the capacity to absorb an increase in use, resulting in no significant indirect impacts from construction. The proposed project / proposed action would not conflict with any recreation goals, policies, and regulations set forth by the Bishop Resource Management Plan, Inyo County General Plan, and the Lower Owens River Project Plan.	NI	None	NA
Operation and Maintenance Operation and maintenance of the proposed project / proposed action would not result in any significant direct or indirect impacts to recreation because it would not require closure or restrict access on any roads or walkways that provide access to the Keeler Dunes by Keeler residents and it would not exclude access to or cause excessive use of a federal, state, or local park.	NI	None	NA
CEQA Significance Determination			
Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities The proposed project / proposed action would not result in a significant impact to recreation from increased use of neighborhood and regional parks and other recreational facilities because (1) there are no neighborhood parks in the vicinity of the project site and (2) the limited size of the construction team and the short duration (3 years) of the time required to install the native plants would not be expected to result in an increase in use at the nearest regional park, Diaz Lake.	NI	None	NA
Construction or Expansion of Recreational Facilities The proposed project / proposed action would not result in a significant impact to recreation from construction or expansion of recreational facilities because construction, operation and maintenance, and restoration activities would not involve the construction or expansion of recreational facilities or involve the construction of any buildings that would cause a rise in population requiring a need to construct or expand any recreational facilities.	NI	None	NA
Alternative 1 – Same as Proposed Project / Proposed Action.	NI	None	NA
Alternative 2 – Same as Proposed Project / Proposed Action.	NI	None	NA
Alternative 3 – Same as Proposed Project / Proposed Action.	NI	None	NA
Alternative 4 – Same as Proposed Project / Proposed Action.	NI	None	NA
Alternative 5 – Same as Proposed Project / Proposed Action.	NI	None	NA
Alternative 6 – No new development is proposed under the No Project / No Action Project Alternative. No recreation impacts would occur under CEQA.	NI	None	NA
Transportation/Traffic			
Proposed Project / Proposed Action			
Direct and Indirect Impacts			
Construction All ingress and egress points will continue to operate at a Level of Service (LOS) of A and would not exceed V/C ratios. The construction phase of the proposed project / proposed action would not adversely affect the capacity of the local highways to accommodate vehicular traffic during an emergency response or evacuation, provide inadequate parking, create a hazardous roadway design, impact adopted policies for congestion management or alternative transportation, or impact air traffic patterns.	MI/LTS	None	N/A
Operation and Maintenance Same impacts as construction.	MI/LTS	None	N/A
CEQA Significance Determination			
Conflict with an Applicable Plan The proposed project / proposed action would not substantially increase traffic volumes under Year 2012 Plus Proposed Project / Proposed Action Conditions. (Intersection LOS calculations are included in Appendix G of the Traffic Impact Study. All study area highway segments would continue to operate at LOS A. Likewise construction traffic on roadway and freeway segments would not exceed V/C ratios. Therefore, construction traffic impacts under Year 2012 Plus Proposed Action Conditions are considered less than significant under CEQA.	MI/LTS	None	N/A

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TABLE ES.5-1
SUMMARY OF ENVIRONMENTAL CONSEQUENCES, *CONTINUED*

Environmental Effects	Level of Impact / CEQA Significance Determination before Mitigation	Mitigation Measures Recommended or Required	Level of Impact / CEQA Significance Determination after Mitigation
Operations and maintenance traffic would consist of hauling water in water trucks and transporting water within the project area using ATVs during the 3 years following completion of the installation of plants and straw bales. Water would be delivered using 8,000-gallon capacity water trucks to the temporary staging areas 1, 2, and 3. Each watering event would include up to 46 trips, for a total of 92 trips per year. As with the construction phase of the proposed project / proposed action, the water truck trips required for operations and maintenance would not adversely impact traffic conditions. Similarly, the supplemental watering activities would be expected to be limited to a maximum of 10 personnel on a given day; substantially lower than the 72 personnel analyzed for the construction phase of the proposed project / proposed action. All study area highway segments would continue to operate at LOS A. Likewise construction traffic on roadway and freeway segments would not exceed V/C ratios.			
Change in Air Traffic Patterns The proposed project / proposed action would not affect air traffic patterns or air traffic levels; therefore there are no impacts to transportation and traffic related to air traffic.	NI	None	N/A
Increase Hazards Construction does not involve any roadway design elements with the exception of use of the existing access route (haul road) turnouts to the proposed project / proposed action site. During construction, access to the proposed project / proposed action would be provided from SR 136. Trips are substantially reduced during the operations and maintenance phase of the proposed project / proposed action. As with the construction phase, access would be provided from SR 136 using an existing access route (haul road) and the Old State Highway. Potential impacts associated with driveways encroaching on California Department of Transportation (Caltrans) right-of-ways would be addressed by obtaining a Caltrans encroachment permit to protect public safety. In addition, any work requiring traffic control on SR 136 would be conducted in accordance with a traffic control plan approved by Caltrans. Therefore, compliance with Caltrans requirements would reduce the potential for direct impacts associated with design features to below the level of significance.	NI	None	N/A
Inadequate Emergency Parking Emergency access to the proposed project / proposed action site during the construction and operations and maintenance phases of the proposed project / proposed action would be provided from SR 136. No direct or indirect impacts are anticipated to occur with regard to emergency access during construction.	NI	None	N/A
Public Transit/Bicycle/Pedestrian Facilities There are no existing or proposed facilities for public transit, bicycles or pedestrians in the vicinity of the proposed project / proposed action; therefore there are no impacts to such facilities.	NI	None	N/A
Alternative 1 – Similar as Proposed Project / Proposed Action as DCMs would be applied to 20 additional acres.	MI/LTS	None	N/A
Alternative 2 – Similar as Proposed Project / Proposed Action as DCMs would be applied to 3 additional acres.	MI/LTS	None	N/A
Alternative 3 – Less than Proposed Project / Proposed Action as ATV trips would be reduced by 80%.	MI/LTS	None	N/A
Alternative 4 – Less than Proposed Project / Proposed Action as ATV trips would be reduced by 80%.	MI/LTS	None	N/A
Alternative 5 – Less than Proposed Project / Proposed Action as ATV trips would be reduced by 80% and no water trucks would be required.	MI/LTS	None	N/A
Alternative 6 – No new development is proposed under the No Project / No Action Project Alternative. No traffic/transportation impacts would occur under CEQA.	NI	None	N/A

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ES.6 AREAS OF CONTROVERSY

Among the areas of controversy is the choice between the proposed project / proposed action, one of the five proposed project / proposed action alternatives, and the no project / no action alternative. Among the issues to be resolved is how best to minimize the level of work undertaken in close proximity to 17 acres characterized by sensitive resources that were identified as of particular concern to the Native American Tribes during the consultation pursuant to Section 106 of the National Historic Preservation Act. Other issues of concern included the use of a temporary aboveground irrigation system or delivery of water using small portable tanks mounted on ATV trailers. Similarly, there were concerns identified about the use of three temporary 22,000-gallon water tanks at three of the four staging areas.

ES.7 ISSUES TO BE RESOLVED

Among the issues to be resolved is whether the proposed project / proposed action, one of the five proposed project / proposed action alternatives, or the no project / no action alternative, best addresses the areas of controversy while achieving attainment of the National Ambient Air Quality Standard (NAAQS).

The proposed project / proposed action and Alternatives 1, 2, 3, 4, and 5 provide for expeditious attainment of the NAAQS. In an effort to avoid and minimize impacts to the emissive areas that contain the most sensitive environmental resources, the District has agreed to install the straw bales and native plants on the portions of the project with the lesser level of environmental sensitivity. If sufficient PM_{10} reduction is achieved with implementation of this initial control area, the sensitive areas specified in the proposed project / proposed action and Alternatives 1, 2, 3, 4, and 5 would be delayed until the monitoring results demonstrate that treatment is not required to achieve attainment or that exceedances are occurring from those areas and that treatment is required. The proposed project / proposed action and proposed project / proposed action alternatives were analyzed on the full build-out scenario, as a reasonable worst case scenario.

Alternatives 3, 4, and 5 integrate refinements to the proposed project / proposed action by providing for a supplemental irrigation system during the first years following the vegetation effort. The proposed project / proposed action and Alternatives 1, 2, 4, and 5 address concerns that were raised by representatives of the Native American tribes during the consultation that was undertaken pursuant to Section 106 of the National Historic Preservation Act related to the temporary use of water tanks at the staging areas. In the proposed project / proposed action and Alternatives 1 and 2, direct delivery of water to the ATV trailers from water trucks was used to replace the temporary use of water tanks. Alternative 4 avoids the temporary use of 22,000-gallon water tanks at three of the four staging areas, by utilizing direct delivery of water to a temporary irrigation system from water trucks staged on State Route 136. Similarly, Alternative 5 avoids the temporary use of 22,000-gallon water tanks at three of the four staging areas, by direct delivery of water to a temporary irrigation system via a pipeline from the Keeler Community Services District well.

TABLE OF CONTENTS

VOLUME I

SECTION ***PAGE***

TABLES **PAGE**

FIGURES ***FOLLOWS PAGE***

VOLUME II

APPENDICES

VOLUME III

APPENDICES

CHAPTER 1.0
INTRODUCTION

1.1 PURPOSE OF THE DOCUMENT

This document is a joint Environmental Impact Report / Environmental Assessment (EIR/EA) that meets the requirements of both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA) for the Keeler Dunes Dust Control Project (proposed project / proposed action). The EIR/EA describes the existing environment that would be affected by, and the environmental consequences that could result from, the proposed project / proposed action and alternatives, as described in Section 2, *Proposed Project / Proposed Action and Alternatives*, of this document.

The EIR/EA (State Clearinghouse No. 2011101065/EA) is a public document that analyzes the potential environmental effects associated with the approval of the proposed project / proposed action in accordance with both CEQA and NEPA.

This document has been prepared by both the Great Basin Unified Air Pollution Control District (District; state lead agency pursuant to CEQA and cooperating agency for NEPA) and the U.S. Department of the Interior Bureau of Land Management (BLM) Bishop Field Office (federal lead agency under NEPA [40 Code of Federal Regulations {CFR} 1508.15]). The EIR/EA provides sufficient evidence and analysis for determining the significance of effects from the proposed project / proposed action consistent with 40 CFR 1508.9 and serves as a basis for reasoned choice among proposed alternatives. Additional explanation of the joint nature of this document is provided in Subsection 1.6.

1.2 BACKGROUND

California law requires all counties to have or belong to an Air Pollution Control District (APCD). Inyo, Mono, and Alpine Counties joined together in 1974 in a joint powers agreement to form the District, which covers the whole Great Basin Valleys Air Basin. The total size of the District is 13,975 square miles or almost 9 million acres. The District population is about 32,000 people. The purpose of an APCD is to enforce federal, state, and local air quality regulations and to ensure that the federal and state air quality standards are met. These standards are set to protect the health of sensitive individuals by restricting how much pollution is allowed in the air. To meet these standards, the District enforces those federal laws for which they are responsible and state laws on stationary (as opposed to mobile) sources of pollution, and passes and enforces regulations established by the District to meet the broader objectives of federal and state statutes and regulations related to air quality.

The District regulates fugitive dust (PM_{10}) emissions in the Owens Valley Planning Area (OVPA) (Figure 1.2-1, *Study Area Boundary in Relation to Owens Valley Planning Area*), consistent with the requirements of the National Ambient Air Quality Standards (NAAQS). In January 1993, the United States Environmental Protection Agency (U.S. EPA) classified the Owens Valley as a serious nonattainment area for PM_{10}. The federal Clean Air Act required that the District produce a State Implementation Plan (SIP) in 1997 that detailed how the PM_{10} problem would be brought into conformance with federal standards.

The dried Owens Lake bed has been the largest single source of PM_{10} emissions in the United States, with annual PM_{10} emissions of more than 80,000 tons and 24-hour concentrations as high

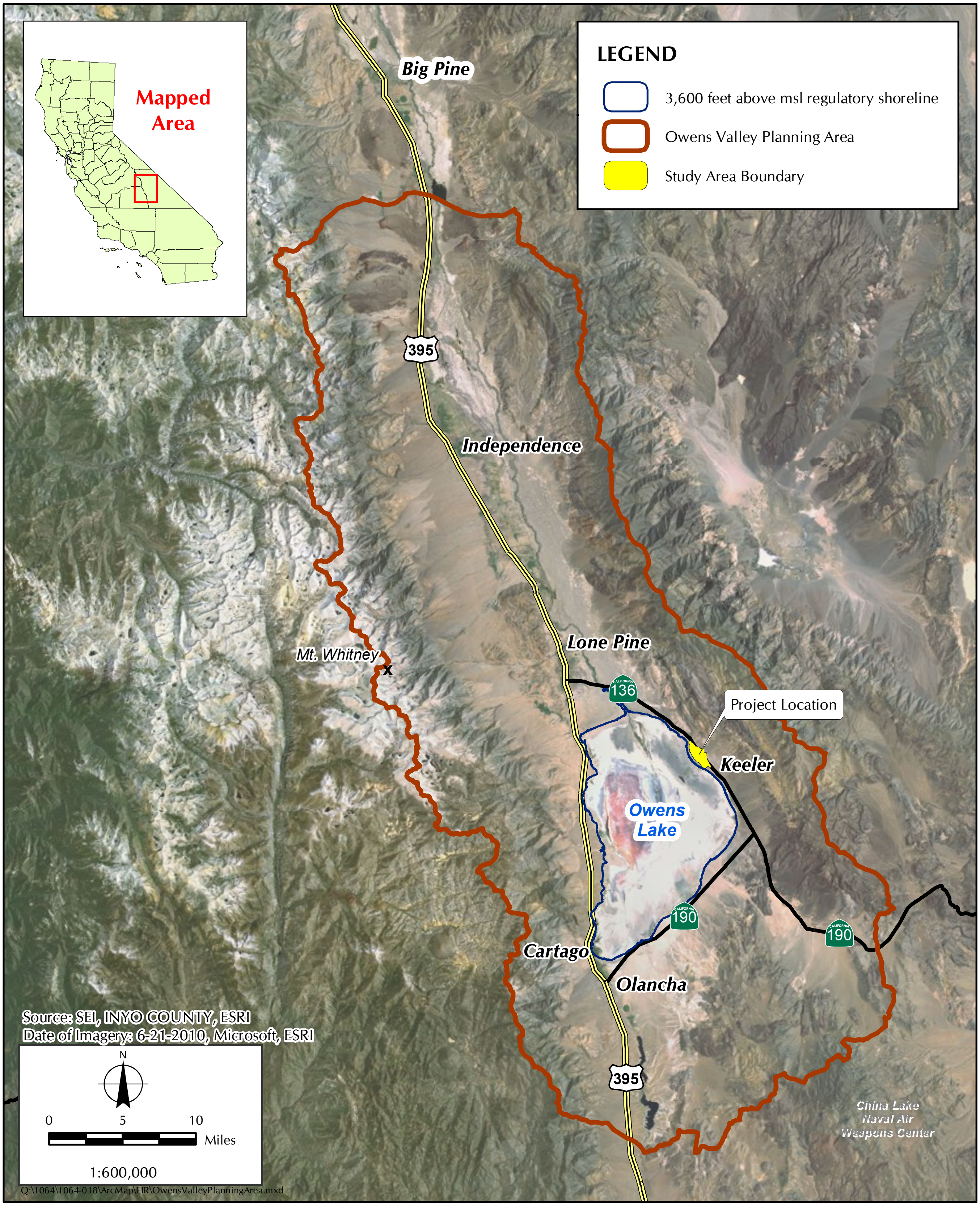

FIGURE 1.2-1

Study Area Boundary in Relation to Owens Valley Planning Area as 130 times the federal air quality standard.[1] The air pollution from Owens Lake is caused by wind dispersing exposed dry lake bed sediments into the air. The Owens River has terminated in the Owens Lake for at least 2,000 years. In the mid-1800s, Owens Lake had a surface area of 71,000 acres, which declined to 44,000 acres by 1905 as a result of climatic conditions and agricultural irrigation.[2] By the 1920s, all that remained of the lake was a 26-square-mile hyper-saline brine pool, and by 1924, Owens Lake was virtually dry.[3] The federal Clean Air Act required that the District produce a State Implementation Plan (SIP) in 1997 that detailed how the PM_{10} problem would be brought into conformance with federal standards.

In the settlement of a dispute over the 1997 SIP, the District signed an agreement with the City of Los Angeles in 1998 that set a schedule for implementing controls in the Owens Valley Planning Area. These controls were approved by the U.S. EPA. The PM_{10} levels were required to be reduced to the federal standard by 2006 or the District would be subject to federal sanctions, which could include withholding of federal highway funds. The District's 2003 SIP revision required a total of 29.8 square miles to be controlled by the end of 2006 and additional areas, if necessary, to meet the standard as they are identified. The 2008 SIP incorporates provisions of the 2006 Settlement Agreement between the District and the Los Angeles Department of Water and Power (LADWP) to expand DCMs to additional areas at Owens Lake in order to attain the NAAQS as soon as practicable.[4] In 2006, an additional 12.7 miles of dust controls were ordered by the District. The 2008 SIP was to include the provisions of the 2006 Settlement Agreement. The 2008 SIP requires that the NAAQS can be attained by March 23, 2017 (CAAA §179[d][3]).

The 2008 SIP identified the Keeler Dunes as one of the off-lake-bed areas consistently exceeding NAAQS and state standards for PM_{10}. The Keeler Dunes are located adjacent to Owens Lake, immediately north-northwest of the community of Keeler, California. Sand and dust from the Keeler Dunes become mobile during high-wind events and, since dust sources on the bed of Owens Lake are about 90 percent controlled, constitute one of the last main dust sources contributing to exceedances of the state and federal 24-hour PM_{10} standard in the communities of Keeler and Swansea.[5] The District has identified the Keeler Dunes as one of the areas that need to be controlled to attain the NAAQS for PM_{10} within the OVPA. The Keeler Dunes have continued to cause an average of six PM_{10} standard exceedances every year since 1993 (Figure 1.2-2, *Federal PM_{10} Standard Exceedances at the Keeler Dunes and Owens Lake, 1993–2013*).

Exceedances of the NAAQS for PM_{10} threaten the health, property, and environment of the residents of the Keeler/Swansea and visitors to the area. The airborne particulate matter from dust events can be inhaled deeply by humans and may result in serious respiratory ailments. There are

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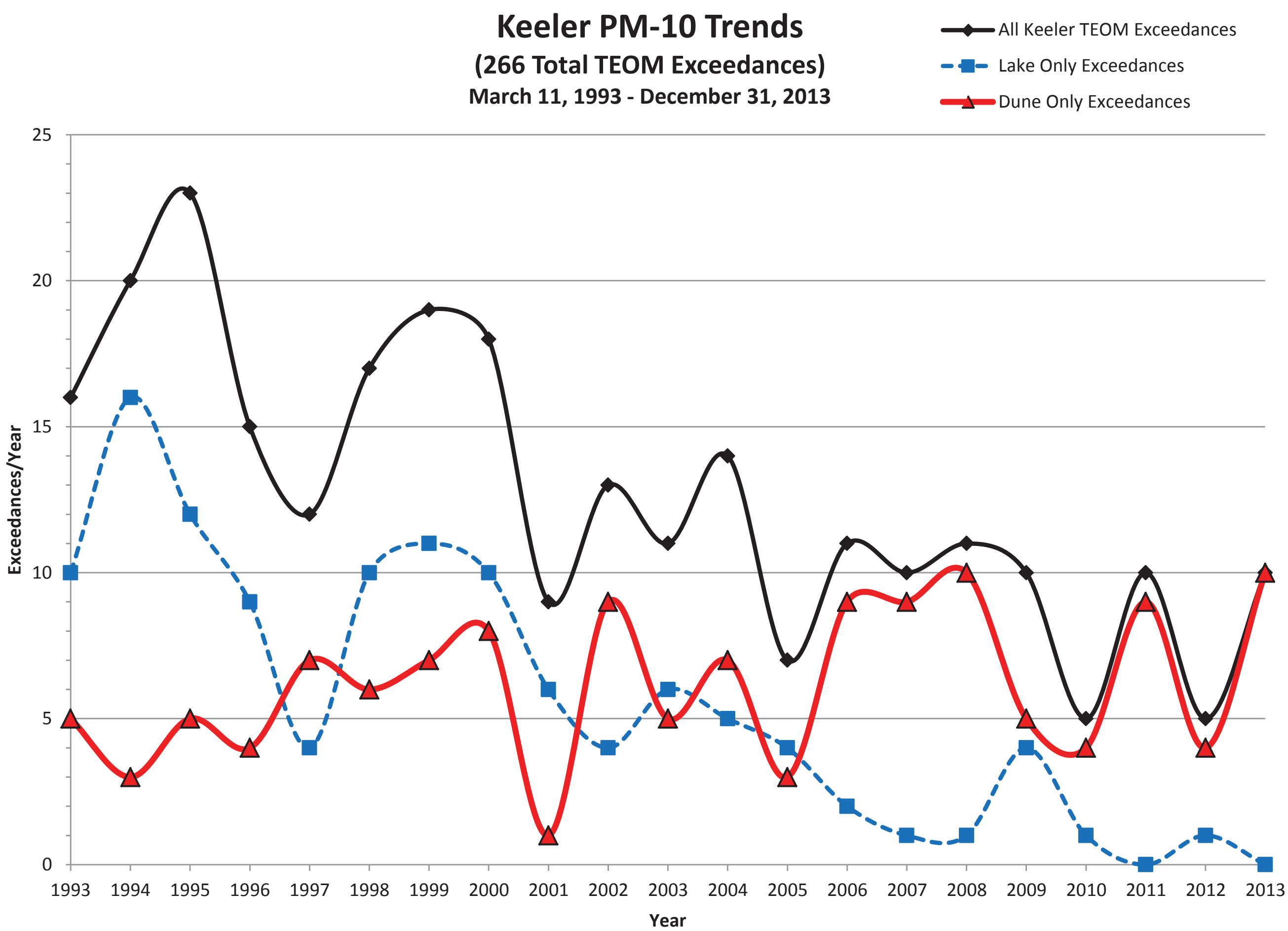
[1] Great Basin Unified Air Pollution Control District. January 2008. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan—Final Subsequent Environmental Report*. Prepared by: Sapphos Environmental, Inc., Pasadena, CA. Bishop, CA.

[2] Mihevc, Todd M., and Gilbert F. Cochran. October 1992. *Simulation of Owens Lake Water Levels: A Preliminary Model*. Prepared by: Water Resources Center, Desert Research Institute, University of Nevada System. Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA.

[3] Great Basin Unified Air Pollution Control District. January 2008. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan—Final Subsequent Environmental Report*. Prepared by: Sapphos Environmental, Inc., Pasadena, CA. Bishop, CA.

[4] Great Basin Unified Air Pollution Control District and City of Los Angeles Department of Water and Power. November 2006. Settlement Agreement Resolving City's Challenge to the District's Supplemental Control Requirement (SCR) Determination for the Owens Lake Bed. Los Angeles, CA.

[5] Great Basin Unified Air Pollution Control District. 28 January 2008. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan*. Bishop, CA.



SOURCE: Great Basin Unified Air Pollution Control District. 2012. Final Staff Report on the Origin and Development of the Keeler Dunes. 16 November 2012.

FIGURE 1.2-2

Federal PM_{10} Standard Exceedances at the Keeler Dunes and Owens Lake, 1993-2012

66 residents of the community of Keeler and about 70 employees of the LADWP and the District who work in the Keeler area affected by the emissions from the Keeler Dunes. The federal[6] and state standards[7] for PM_{10} 24-hour average are 150 micrograms per cubic meter ($\mu g/m^3$) and 50 $\mu g/m^3$, respectively, measured over 24 hours. The federal standard is not to be exceeded more than once per year on average over 3 years. The goal for the more stringent state standard is not to exceed the daily standard on any day. The maximum 24-hour PM_{10} exceedance in the community of Keeler during the period of 2009 through 2012 was 13,380 $\mu g/m^3$. During this same period, there were 31 federal exceedances and 126 state PM_{10} exceedancesfor particulate matter.[8] The District issues Stage 1 Health Advisories to communities when hourly PM_{10} is greater than 400 $\mu g/m^3$ and Stage 2 Health Advisories when hourly PM_{10} is greater than 800 $\mu g/m^3$. During a Stage 1 event, children, the elderly, and people with heart or lung problems are recommended to refrain from strenuous outdoor activities in the impacted area. During a Stage 2 event, everyone should refrain from strenuous outdoor activities in the impacted area. During the 2009 to 2012 period, there were 156 hourly events where PM_{10} exceeded the criteria for a Stage 1 Health Advisory, and 105 hourly events exceeded the Stage 2 criteria.[9]

Although dust storms from the dunes can occur during anytime of the year, severe dust storms occur primarily from October through June, with the highest frequency of dust events occurring in December and March through May. The Keeler Dunes sand deposits extend over an approximately 1.3-square-mile area and are spreading to the east and southeast, at an approximate rate of 30 meters per year,[10] toward the community of Keeler and the foothills of the Inyo Mountains.

The District conducts monitoring in the Keeler area, with PM_{10} monitoring in the community of Keeler since 1990 and sand motion monitoring at two sites in the Keeler Dunes since 2000. In response to commitments made by the District in its 2006 Settlement Agreement with the LADWP and the 2008 SIP, an additional 12 sand motion monitoring sites were added in 2010 and five (5) in 2011 for the purpose of establishing a monitoring program to gather information on the location and magnitude of dust emissions in the dunes and with the goal of developing a strategy for PM_{10} emission control. The 2008 SIP requires control of the dust emissions from the Keeler Dunes on or before December 31, 2013, in order to demonstrate attainment of the federal standard within the OVPA by 2017.[11] It is currently anticipated that project installation will be complete by spring 2015. The federal Clean Air Act requires three years of data to demonstrate attainment; therefore, the District is seeking to demonstrate attainment by 2018. The District is responsible for developing and implementing a dust control strategy and plan for the Keeler Dunes PM_{10} emissions.

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[6] U.S. Environmental Protection Agency. Accessed 10 October 2011. *National Ambient Air Quality Standards*. Available at: http://www.epa.gov/air/criteria.html

[7] California Air Resources Board. Accessed 11 October 2011. "California Ambient Air Quality Standards." Available at: http://www.arb.ca.gov/research/aaqs/caaqs/pm/pm.htm

[8] Kiddoo, P., Great Basin Unified Air Pollution Control District, Bishop, CA. November 8, 2013. Air quality data provided to Sapphos Environmental, Inc., Pasadena, CA.

[9] Kiddoo, P., Great Basin Unified Air Pollution Control District, Bishop, CA. November 8, 2013. Air quality data provided to Sapphos Environmental, Inc., Pasadena, CA.

[10] Bacon and Lancaster, 2012. Geomorphic Mapping of the Keeler Dunefield and Surrounding Areas Final Report. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20D%20-%20Geomorphology/Bacon%20and%20Lancaster%202012_FINAL_REPORT_Geomorphic_Mapping_of_the_Keeler_Dunefield_and_Surrounding_Areas20121114.pdf

[11] Great Basin Unified Air Pollution Control District. 28 January 2008. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan*. Bishop, CA.

It is anticipated that the District will submit an Application for Transportation and Utility Systems and Facilities on Federal Lands (Standard Form 299 [05/2009] or "SF-299") to the BLM. The SF 299 would be required to implement the project on lands managed by the BLM. The District will also need to obtain a lease from the LADWP for implementing controls on LADWP lands within the Keeler Dunes.

In addition to the District, BLM, and LADWP, other stakeholders have an interest in the proposed project / proposed action and alternatives: Inyo County, Lahontan Regional Water Quality Control Board (RWQCB), Lone Pine Paiute-Shoshone Tribe, Big Pine Band of Owens Valley, Bishop Paiute Tribe, Fort Independence Indian Community of Paiute Indians, Timbisha Shoshone Tribe, Office of Historic Preservation, Native American Heritage Commission, California Department of Transportation (Caltrans) District 9, Keeler Community Services District, and Keeler and Swansea residents.

1.3 PROPOSED PROJECT / PROPOSED ACTION OVERVIEW

The proposed project / proposed action consists of installation and monitoring of a DCM, consisting of straw bales and native vegetation, on 194 acres within a total study area of approximately 870 acres of active and mobile sand deposits. Construction would require four staging areas and a temporary access route from each staging area to the proposed project / proposed action site.

1.3.1 LOCATION

The area requiring dust control is located north-northwest of the community of Keeler, California, and east of the 110-square-mile (70,000-acre) Owens Lake bed within the Owens Valley, Inyo County, California (Figure 1.3.1-1, *Regional Vicinity Map*). The proposed project / proposed action area is located in Sections 30, 31, and 32, Township 16 South, Range 37 East; and Sections 24, 25, and 36, Township 16 South, Range 38 East, Mount Diablo Baseline and Meridian, California, approximately 65 miles south of the City of Bishop, 10 miles west of the boundary of Death Valley National Park, 11 miles to the east of the boundary of Sequoia National Park, and 48 miles north of the City of Ridgecrest (Figure 1.3.1-1). In the vicinity of and adjacent to the proposed project / proposed action area, there are two communities located in the unincorporated area of Inyo County, the community of Keeler to the southeast and the community of Swansea to the north (Figure 1.3.1-2, *Study Area Location Map*). One designated Native American reservation (Lone Pine Paiute-Shoshone Indian Reservation) and the town of Lone Pine are approximately 10 miles to the northwest (Figure 1.3.1-1).

The proposed project / proposed action is located on lands administered by the BLM and the LADWP. The proposed project / proposed action site is approximately 194 acres in size and is located within a 1.4-square-mile (approximately 870-acre) study area. The study area is located on the Keeler alluvial fan situated between the base of the Inyo Mountains to the east-northeast and the dried bed of Owens Lake to the west-southwest. The study area extends approximately 2.5 miles to the northwest from the community of Keeler and is bisected by California State Route 136 (SR 136).

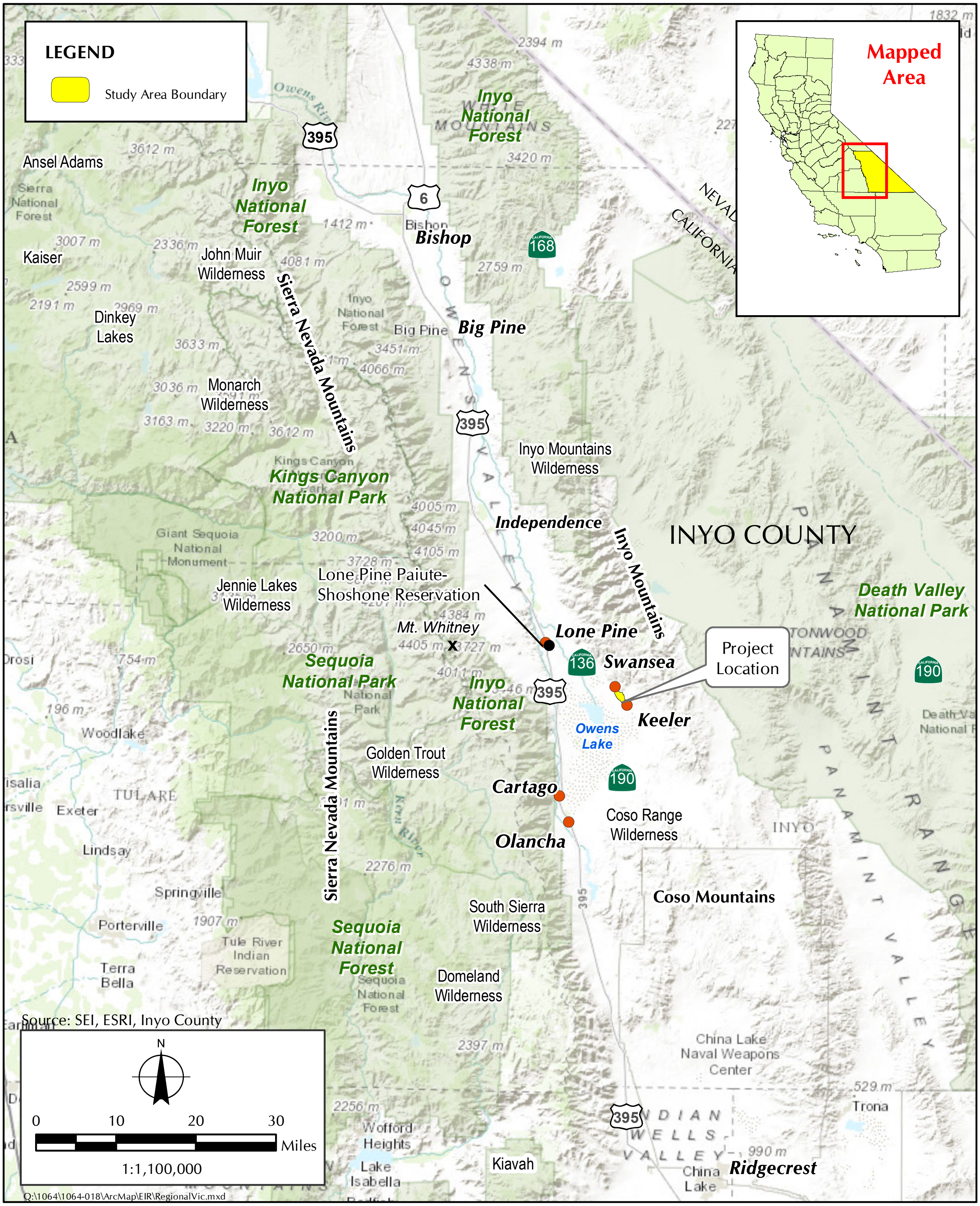

FIGURE 1.3.1-1

Regional Vicinity Map

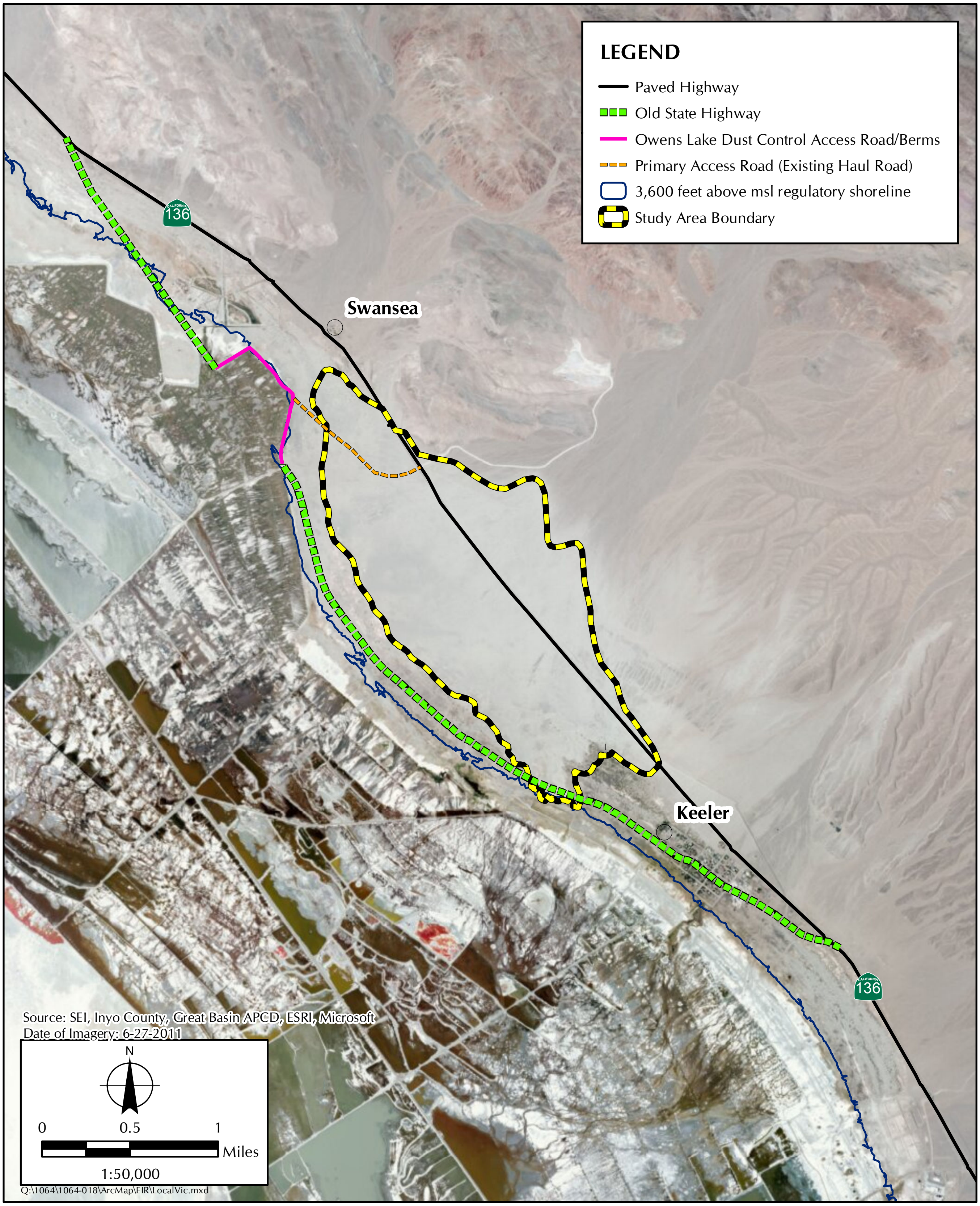

FIGURE 1.3.1-2

Study Area Location Map

Within the approximately 870-acre study area, land ownership is as follows:

- BLM: approximately 780 acres (89 percent)
- LADWP: 67 acres (8 percent)
- Other Private/Business: 1 acre (<1 percent)
- State of California right-of-way: 24 acres (3 percent)

1.4 OBJECTIVES OF, AND PURPOSE AND NEED FOR, THE PROPOSED PROJECT / PROPOSED ACTION

Pursuant to both CEQA and NEPA, goals and objectives and purpose and need for the proposed project / proposed action have been established. Section 15124 of the CEQA Guidelines requires that the EIR include a statement of objectives sought by the proposed project / proposed action. These objectives identify the underlying purpose of the proposed project / proposed action and provide a basis for identification of alternatives evaluated in the EIR. A clearly written statement of objectives allows the lead agency to develop a reasonable range of alternatives to evaluate in the EIR and aids the decision-makers in preparing findings or a statement of overriding considerations, if necessary. The stated objectives should include the underlying purpose of the proposed project / proposed action.

Similarly, pertaining to the BLM's analysis, the regulations that implement NEPA require that an EA include brief discussions of the purpose and need for the proposed project / proposed action, a reasonable range of alternatives, the environmental impacts of the proposed project / proposed action and alternatives, and a listing of the agencies and persons consulted (40 CFR 1508.9(b)).

The overall purpose of the proposed project / proposed action is to reduce the exposure of residents of the communities of Keeler and Swansea to unhealthful levels of PM_{10} emissions and to bring the communities of Keeler and Swansea into attainment with the federal NAAQS and California State 24-hour PM_{10} standard as soon as possible. The 2008 SIP requires that the OVPA (including the emissions from the Keeler Dunes) be in attainment of the federal PM_{10} NAAQS by March 2017, but due to delays in getting funding for the project and in completing this EIR/EA, this deadline will not be achieved. Implementation of the proposed project / proposed action will reduce the PM_{10} emissions from the Keeler Dunes to levels below the federal and state 24-hour standards such that the communities of Keeler and Swansea would be in attainment by spring 2018.

1.4.1 DISTRICT

The District's goal for control of dust emissions, consistent with the provisions of the federal and state Clean Air Acts, is to utilize measures that reduce PM_{10} exceedances while minimizing impacts to natural and cultural resources located within the Keeler Dunes and surrounding area. The dust control strategy includes establishment and management of native vegetation and the use of straw bales as temporary wind breaks to provide immediate control and to aid in vegetation establishment. The ultimate goal of the proposed project / proposed action is to implement a strategy that not only controls dust emissions from the Keeler Dunes but also protects resources and creates a natural landscape that is self-sustaining and can be operated and maintained with minimal inputs.

The District identified and prioritized six basic objectives that are important to achieving the proposed project / proposed action goals:

- Reduce the levels of windblown dust that are causing and contributing to exceedances of the NAAQS and California State standard for particulate matter (PM_{10}) air pollution
- Attain the NAAQS and California State PM_{10} standards in the communities of Keeler and Swansea
- Minimize impacts to natural resources
- Minimize impacts to historic properties below the threshold of adverse effect
- Create a landscape that mimics comparable natural environments
- Be self-sustaining and operated with minimal resources

1.4.2 BLM PURPOSE AND NEED

The BLM's purpose and need for action is to respond to the District's application for a right-of-way (ROW) to implement the proposed dust control measures (DCMs) on public land in the Keeler Dunes. Based on the analyses in this EIR/EA, the Bishop Field Manager will decide whether to grant a ROW for the proposed action or one of the alternatives and, if granted, what terms and conditions including minimizing measures and mitigation will be applied to the grant.

The BLM is authorized to grant ROWs on public lands for "facilities which are in the public interest and which require rights-of-way over, upon, under, or through such lands" (Section 501 [a][7]). A ROW application is required to implement the District's project to construct, operate, and maintain DCMs on public land under the jurisdiction of the BLM.

1.5 JOINT CEQA/NEPA DOCUMENT

The EIR/EA was prepared as a joint state/federal environmental document. The EIR portion of the document has been prepared pursuant to CEQA[12] and the CEQA Guidelines.[13] The EA portion of this joint EIR/EA has been prepared pursuant to NEPA[14] and the Council on Environmental Quality's (CEQ's) NEPA regulations.[15]

1.5.1 CEQA EIR

As provided in the CEQA Guidelines, public agencies are charged with the duty to avoid or minimize environmental damage where feasible. In discharging this duty, the District has an obligation to balance a variety of public objectives, including economic, environmental, and social issues (Section 15021 of the CEQA Guidelines). The findings and conclusions of the EIR regarding

[12] California Public Resources Code Section 21000 et seq.

[13] California Code of Regulations, Title 14, Section 15000 et seq.

[14] 42 U.S.C.§ 4321 et seq.

[15] 40 CFR § 1500-1508.

environmental impacts do not control the District's discretion to approve, deny, or modify the proposed project, but instead are presented as information intended to aid the decision-making process. Sections 15122 through 15132 of the CEQA Guidelines describe the required content of an EIR: a description of the project and the environmental setting (existing conditions), an environmental impact analysis, mitigation measures, alternatives, significant irreversible environmental changes, growth-inducing impacts, and cumulative impacts. As a project-level EIR, this document primarily focuses on the changes in the environment that would result from construction and operation of the proposed project. The District is required to consider the information in the EIR, along with any other relevant information, in making final decisions on the proposed project as stated in Section 15121 of the CEQA Guidelines.

1.5.2 NEPA EA

Under the NEPA process, the CEQ regulations for implementing NEPA require federal agencies to identify and assess reasonable alternatives to the proposed actions that will restore and enhance the quality of the human environment and avoid or minimize adverse environmental impacts. Project planning activities are required to include environmental issues and to integrate impact studies required by other environmental laws and Executive Orders into the NEPA process. The BLM must also comply with the Department of the Interior's regulations for implementing the procedural requirements of NEPA[16] in addition to the BLM's NEPA Handbook[17] in processing ROW applications.

The CEQ's regulations for implementing NEPA describe the purpose of the environmental review as "ensure(ing) that environmental information is available to public officials and citizens before decisions are made and before actions are taken."[18] In this case, the District's application for the installation, monitoring, and management of DCMs on public land managed by the BLM triggers the need for NEPA environmental review. The Bishop Field Manager will use the information contained in this EIR/EA to make a decision on whether to grant an ROW for project implementation and, if so, to grant it as requested or modified.

1.5.3 REVIEW AND CERTIFICATION PROCESS

1.5.3.1 CEQA PROCESS

A. Notice of Preparation

In accordance with California Code of Regulations (CCR) Section 15082, a Notice of Preparation (NOP) concerning the EIR for the proposed project was circulated for a 30-day review period that began on October 25, 2011, and was closed on November 25, 2011.

The NOP was sent to the State Clearinghouse on October 26, 2011, and distributed to various federal, state, regional, and local government agencies. A public Notice of Availability (NOA) of the NOP was provided in *The Inyo Register* on November 5 and 8, 2011. The NOP was mailed

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[16] 43 CFR Part 46.

[17] Bureau of Land Management, 2008. National Environmental Policy Act Program. January 2008. Available at: http://www.blm.gov/pgdata/etc/medialib/blm/ak/aktest/planning/planning_general.Par.2116.File.dat/Handbook.NEPA.H-1790-1.2k8.01.30%255B1%255D.pdf

[18] 40 CFR § 1500.1 (b).

directly to more than 160 agencies and interested parties and posted at the District's Keeler Office, 190 Cerro Gordo Avenue, Keeler, California; at the Eastern Sierra InterAgency Visitor Center, Highway 395, Lone Pine, California; and at the Keeler, Lone Pine, and Olancha post offices. The NOP advertised two public scoping meetings for interested parties and agencies to receive information on the proposed project / proposed action and the CEQA and NEPA process, as well as to provide an opportunity for the submittal of comments. All verbal and written comments related to environmental issues that were provided during public review of the NOP and at scoping meetings have been taken into consideration in the preparation of this EIR. This EIR considers alternatives that are capable of avoiding or reducing significant effects of the proposed project. The comment period on the NOP closed on November 25, 2011. Five comment letters were received in response to the NOP (Appendix A, *Notice of Preparation*).

B. Draft EIR

The Draft EIR provides a detailed description of the proposed project, the regional and local environmental setting, identification of project impacts, and mitigation measures. Six project alternatives, including the No Project Alternative, are provided, as well as a discussion of cumulative impacts, other CEQA-required considerations, and impacts found not to be significant. A Notice of Completion (NOC) announcing the start of the public review period for the Draft EIR was filed with the State Office of Planning and Research by the District.

C. Public Notice / Public Review

Although CEQA requires only a 30-day public review period, this Draft EIR/EA has been distributed to various federal, state, regional, and local government agencies and interested organizations and individuals for a 45-day public review period. The Draft EIR/EA was provided to the State Clearinghouse on March 21, 2014, for additional distribution to agencies. In addition, a public NOA and NOC of the EIR/EA appeared in *The Inyo Register* and was mailed directly to interested parties requesting the document. The dates of the public review period are specified on the transmittal memo accompanying this Draft EIR/EA. The Great Basin Unified Air Pollution Control District anticipates hosting two public workshops to solicit comments from public agencies and the general public on the Draft EIR/EA. One public workshop is expected to be held in Keeler, while the other workshop is expected to be held in either Lone Pine or Independence.

Written comments provided by the general public and public agencies will be evaluated, and written responses will be prepared for all comments received during the designated comment period. Upon completion of the evaluation, a Final EIR/EA will be prepared and provided to the District for certification of compliance with CEQA and to the BLM for certification of compliance with NEPA and for review and consideration as part of the decision-making process for the proposed project / proposed action.

Public agencies and the general public will have additional opportunities to submit comments on the Final EIR/EA during the consideration of the EIR by the Great Basin Unified Air Pollution Control District Governing Board scheduled for July 2014, at the Board of Supervisors Chambers located at 224 North Edwards Street, Independence, California 93526.

D. Response to Comments / Final EIR

A Final EIR will be prepared following the public review and comment period for the Draft EIR. The Final EIR will include the response to comments; revisions to the Draft EIR developed as a result of the public review period; and letters of comment organized by federal, state, regional, and local agencies and organizations, followed by individual and topical responses to the issues.

E. Certification of the EIR

In accordance with CCR 15090, the District will certify that the Final EIR has been completed in compliance with CEQA; that the information contained in the Final EIR was presented to the District's Governing Board for review and consideration; and that the Final EIR reflects the District's independent judgment and analysis. If the Final EIR is determined to be adequate and complete, the District may certify the EIR at a public hearing.

F. Mitigation Monitoring and Reporting Program

According to CCR Section 15097, the District must adopt a Mitigation Monitoring and Reporting Program (MMRP) for mitigation measures that have been incorporated into or imposed on the proposed project / proposed action to reduce or avoid significant effects on the environment.

The specific reporting or monitoring program required by CEQA is not required to be included in the EIR. However, any mitigation measures that are adopted as part of the certified Final EIR will be considered as conditions for approval of the proposed project and will be included in the MMRP to ensure and verify compliance.

1.5.3.2 NEPA Process

The EA will be circulated for public comment and review simultaneously with the Draft EIR during the 45-day public review period.

The EA may result in a Finding of No Significant Impact (FONSI) or a finding that there are unavoidable significant impacts. A FONSI must provide a basis for the conclusion that the proposed action would not have a significant effect on the human environment or, if the effects are significant, that they can be reduced or avoided through mitigation to below the level of significance. In such a case, the FONSI must clearly identify whether the mitigation measures are needed to reduce the effects to below the level of significance. If there is a finding that there are unavoidable significant impacts, then an Environmental Impact Statement (EIS).A Decision Record will be issued by the Bishop Field Manager to document the BLM's decision based on the EA.

1.6 AGENCY ROLES AND RESPONSIBILITIES

1.6.1 District

As noted previously, the District is responsible for developing a dust control strategy and plan for the Keeler Dunes PM_{10} emissions. Although the 2008 SIP requires control of the dust emissions from the Keeler Dunes on or before December 31, 2013, in order to demonstrate attainment of the federal standard within the OVPA by 2017, it is anticipated that, if approved, the project would be installed by spring 2015 and be able to demonstrate attainment by 2018.[19]

Pursuant to CEQA, the proposed project will require three District actions:

- Certification of the Final EIR
- Approval of a project MMRP for any required mitigation measures
- Approval of CEQA Findings pursuant to CEQA Guidelines Section 15091

1.6.2 BLM

The proposed action is located in part on approximately 780 acres of public lands managed by the BLM Bishop Field Office. Upon review of the EA, the BLM will decide whether to grant or deny a ROW request to carry out the proposed action on public lands.

1.6.3 OTHER AGENCY REVIEWS AND/OR CONSULTATIONS

The proposed project / proposed action would require permits and approval from various federal and state regulatory agencies. The agencies and potential permits and approvals are identified in the following sections.

1.6.3.1 FEDERAL

A. United States Fish and Wildlife Service

The United States Fish and Wildlife Service (USFWS) is responsible for oversight of the federal Endangered Species Act (ESA) and the Migratory Bird Treaty Act. There are no plant or wildlife species listed under the ESA that are known or expected to be present with the study area; therefore, consultation with the USFWS is not required.

B. BLM and California State Historic Preservation Office

The BLM will comply with Section 106 of the National Historic Preservation Act (NHPA),through the use of the California State Protocol Agreement . The proposed project / proposed action and alternatives would not adversely impact historical resources on state-owned lands. The BLM is the lead federal agency, so the District has no Section 106 consultation responsibility.

The BLM consulted with interested Native American tribes and individuals to identify archaeological sites to which the tribe attached cultural or religious importance within the proposed action area. The BLM sent letters and organized meetings and field visits that included tribal representatives, the proposed action proponent, and members of local government. These meeting were held to discuss the proposed action and to obtain their comments and concerns about the possible impacts of the proposed action.
Section 106 requires that all compliance with the NHPA be completed prior to a Record of Decision (ROD). The CEQA process, however, allows for SHPO review when the document is circulated for

[19] Great Basin Unified Air Pollution Control District. 28 January 2008. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan*. Bishop, CA.

public review. This review is accomplished through distribution of the Draft EIR/EA to the Governor's Office of Planning and Research, who in turn distributes the EIR to all appropriate state agencies.

1.6.3.2 STATE

A. California Department of Fish and Wildlife

The California Department of Fish and Wildlife (CDFW) is responsible for overseeing the California ESA, approving Streambed Alteration Agreements (SAA) (Section 1600 of the California Fish and Game Code), and enforcing the California Native Plant Protection Act (NPPA).

CDFW will review the proposed project / proposed action for potential impacts on state-listed species. No streambeds would be altered by the proposed project / proposed action; therefore, a SAA would not be required. Several species listed under the NPPA have been identified with the potential to occur near or within the proposed project / proposed action, and the CDFW will be responsible for reviewing the proposed project / proposed action to ensure compliance with the NPPA requirements.

B. California Regional Water Quality Control Board Lahontan Basin Region 6

RWQCB Lahontan Region 6 is responsible for regulating water quality. In accordance with the federal Clean Water Act (CWA) of 1972, which regulates point-source and non-point-source discharges to receiving waters, a National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities will be required for the proposed project / proposed action. The permit requires a public Notice of Intent (NOI) to discharge storm water to be filed. The proposed project / proposed action would be required to develop and implement a Storm Water Pollution Prevention Plan (SWPPP). The RWQCB will be consulted regarding potential impacts to jurisdictional waters. If applicable, CWA Section 401 Water Quality Certification, and permitting under the California Porter-Cologne Act, will be obtained for the proposed project / proposed action.

C. California Department of Transportation

Caltrans has jurisdiction over all of the state's highways and roads. The District has coordinated with Caltrans in the evaluation of the effects of storm water diversion structures built upstream of the Keeler Dunes and the design of the DCMs. Two of the action alternatives under consideration would require work within the State Highway 136 ROW. Access to the site will be via State Highway 136. An encroachment permit will be required.

D. California Environmental Protection Agency

The OVPA was designated to be in serious nonattainment of the NAAQS for PM_{10} by the California Environmental Protection Agency (CEPA). Subsequently, the State of California delegated the District to prepare a SIP for the OVPA that demonstrated how PM_{10} emissions would be decreased to prevent violations of the NAAQS. As noted previously, the 2008 SIP requires control of the dust emissions from the Keeler Dunes on or before December 31, 2013, in order to demonstrate attainment of the federal standard within the OVPA by 2017; however, it is anticipated that if approved, the proposed project / proposed action would be installed by spring 2015 and be able to demonstrate attainment by 2018.[20] CEPA establishes findings on the OVPA's status in meeting NAAQS as required by the Clean Air Act Amendments in the SIP.

E. California Air Resources Board

The California Air Resources Board (CARB) is a part of the CEPA and is responsible for attaining and maintaining healthy air quality in the state. The CARB reviewed and approved the 2008 SIP for the OVPA.

F. California Native American Heritage Commission

The California Native American Heritage Commission's (NAHC's) duties include the inventory of places of religious or social significance to Native Americans and the identification of known graves and cemeteries of Native Americans on private and state lands. Section 5097.98 of the Public Resource Code specifies a protocol to be followed when the NAHC receives notification of a discovery of Native American human remains from a county coroner. The NAHC was consulted regarding the proposed action's potential to affect Native American resources.

1.6.3.3 LOCAL

A. Inyo County

Although the majority of the proposed project / proposed action is located on federal lands, BLM regulations require that resource management plans be consistent with local governments' officially approved resource-related plans.[21] Coordination was undertaken with the Inyo County Planning Department. The proposed project / proposed action area is zoned Open Space in the Inyo County Zoning Ordinance. The proposed project / proposed action is considered Agricultural, which is a permitted use in the Open Space Zone. As a result, Inyo County has determined that no discretionary action will be required by Inyo County.[22]

1.7 POSSIBLE BENEFITS OF THE PROPOSED PROJECT / PROPOSED ACTION

1.7.1 PROTECTING PUBLIC HEALTH

The proposed project / proposed action is designed to be protective of public health, particularly residents of the communities of Keeler and Swansea who are exposed to adverse levels of PM_{10} during high wind events. The maximum 24-hour PM_{10} exceedance of the NAAQS in the community of Keeler during the period of 2009 through 2012 was 13,380 $\mu g/m^3$. During this same period, there were 31 federal exceedances and 126 state PM_{10} exceedances[23] for particulate matter.

[20] Great Basin Unified Air Pollution Control District. 28 January 2008. *2008 Owens Valley PM10 Planning Area Demonstration of Attainment State Implementation Plan*. Bishop, CA.

[21] FLPMA, Sec. 202(c)(9).

[22] Great Basin Unified Air Pollution Control District September 13, 2013 email regarding discussion with Josh Hart, Inyo County Planning Director.

[23] Kiddoo, P., Great Basin Unified Air Pollution Control District, Bishop, CA. November 8, 2013. Air quality data provided to Sapphos Environmental, Inc., Pasadena, CA.

When inhaled, small particles can avoid the natural defenses of the human respiratory system and damage the respiratory tract. Studies have strongly linked elevated particulate to premature deaths, hospital admissions, emergency room visits, and asthma attacks.[24] Particulate matter inhalations can also significantly reduce development of lung function in children.[25] In addition, inhalation of high levels of PM_{10} can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infection.[26] Of greatest concern are recent studies that link PM_{10} exposure to the premature death of people who have preexisting heart and lung disease, especially the elderly. The goal of the proposed project / proposed action is to meet NAAQS for PM_{10} that would be protective of public health.

1.7.2 IMPROVING AIR QUALITY

The proposed project / proposed action is designed to result in an improvement in the air quality of the OVPA, which is in nonattainment for PM_{10}. The 2008 SIP provides a dust control plan using BACM methods applied to specific areas of the desiccated Owens Lake and for addressing the Keeler Dunes emissions located adjacent to Owens Lake. Ongoing air monitoring has identified the Keeler Dunes as one of the last remaining dust sources causing exceedances of the NAAQS in the OVPA. As a result of data collected since April 2000, the District has identified the Keeler Dunes as one of the areas that need to be controlled to attain the NAAQS for PM_{10} within the OVPA.

1.7.3 PROTECTING ENVIRONMENTALLY SENSITIVE AREAS FROM ACCELERATION OF EXPOSURE

Sensitive resources within the Keeler Dunes are adversely affected by the deposit and constant reworking of these sands. The proposed project / proposed action would create a stable natural dune environment that would reduce wind speed at the ground surface and, consequently, act as a stabilizing measure during high wind events, reducing adverse impacts to sensitive resources within the dunes.

1.8 RELATIONSHIP TO OTHER STATUTES, REGULATIONS, AND PLANS

Implementation of DCMs in the proposed project / proposed action area would be consistent with federal laws and regulations, as well as other plans, programs, and policies of state and local government agencies, to the extent practical. Specific approvals, permits, and regulatory requirements would be required for constructing, operating, and maintaining the proposed project / proposed action.

[24] California Air Resources Board. November 2007. *Recent Research Findings: Health Effects of Particulate Matter and Ozone Air Pollution, November 2007*. Available at: http://www.arb.ca.gov/research/health/fs/pm_ozone-fs.pdf

[25] California Air Resources Board. November 2007. *Recent Research Findings: Health Effects of Particulate Matter and Ozone Air Pollution, November 2007*. Available at: http://www.arb.ca.gov/research/health/fs/pm_ozone-fs.pdf

[26] Great Basin Unified Air Pollution Control District. Accessed 4 January 2012. *Particular Matter Air Pollution*. Available at: http://www.gbuapcd.org/pm10.htm

1.8.1 FEDERAL POLICY CONSISTENCY AND LAND USE PLAN CONFORMANCE

1.8.1.1 FEDERAL CLEAN AIR ACT

The Clean Air Act of 1990 modified and extended legal authority provided by earlier Clean Air Acts and contains the legal authority for federal programs regarding air pollution control and authorizes the EPA to establish the NAAQS to protect public health and the environment.

1.8.1.2 FEDERAL LAND POLICY AND MANAGEMENT ACT, 1976 AS AMENDED

Title V of the FLPMA addresses ROWs and establishes pubic land policy and guidelines for administration; and it provides for management, protection, development, and enhancement of public lands. The Secretary of the Interior is authorized to grant ROWs on public lands for "facilities which are in the public interest and which require rights-of-way over, upon, under, or through such lands."[27] The proposed project / proposed action is necessary to meet the NAAQS for the benefit of public health and improvement of air quality.

1.8.1.3 FEDERAL ENDANGERED SPECIES ACT

The federal ESA defines species as endangered and threatened when they are at risk of extinction and provides regulatory protection for any species thus designated. The purposes of the federal ESA are to provide a means to conserve the ecosystems on which endangered and threatened species depend and to provide a program for conservation and recovery of these species. Section 9 of the federal ESA prohibits the take of species that are listed by the USFWS as threatened or endangered. In recognition that take cannot always be avoided, Section 10(a) of the federal ESA includes provisions for take that is incidental to, but not the purpose of, otherwise lawful activities. The ESA requires that federal agencies ensure that their actions do not jeopardize the continued existence of a listed species or result in destruction or adverse impacts and modifications of designated critical habitat of the species.

1.8.1.4 NATIONAL HISTORIC PRESERVATION ACT

Section 106 of the NHPA requires that federal agencies with direct or indirect jurisdiction over federally funded, assisted, or licensed undertakings must take into account the effect of the undertaking on any historic property, regardless of jurisdiction. The BLM, through the California Protocol Agreement has the jurisdiction to identify historic properties and treat them accordingly. Historic properties are defined as "any prehistoric or historic district, site, building, structure, or object included, or eligible for inclusion in, the National Register of Historic Places (NRHP)."[28]

1.8.1.5 BISHOP RESOURCE MANAGEMENT PLAN

This proposed project / proposed action is subject to the BLM's Bishop Resource Management Plan (RMP). The RMP provides guidance and policies for management for 750,000 acres of public land administered by the Bishop Field Office in Inyo and Mono Counties. All actions approved or authorized by the BLM must be consistent with the terms, conditions, and decisions of the RMP.

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[27] FLPMA, Section 501 (a)(7).

[28] 36 CFR Part 800.2.

The proposed project / proposed action must conform to the General Policies, Area Manager's Guidelines, Valid Existing Management, Standard Operating Procedures, Decisions and Support Needs prescribed in the Bishop RMP.

The Keeler Dunes are located within the Owens Lake Management Area and South Inyo Management Area, two of nine management areas identified in the RMP. The proposed DCMs would be implemented within the Owens Lake Management Area only. The management plan's policies and guidelines applicable to the Owens Lake Management Area address several key issues: preservation and protection of the environment, archaeological artifacts, wildlife habitat, management of land tenure adjustment, domestic sources of mineral, off-highway vehicle use, grazing, and recreation on public lands. In this EIR/EA, the RMP's stipulations are discussed further in Section 3: Environmental Setting.

1.8.2 STATE POLICY CONSISTENCY

1.8.2.1 CALIFORNIA CLEAN AIR ACT

The California Clean Air Act was signed into law in 1988 and spelled out in statute and in California's air quality goals, planning mechanisms, regulatory strategies, and standards of progress. The California Clean Air Act provides the state with a comprehensive framework for air quality planning regulation.

1.8.2.2 CALIFORNIA PORTER-COLOGNE WATER QUALITY CONTROL ACT

The federal CWA provides for delegation of certain water-quality control and planning responsibilities to the states. Water Quality Control Plans (Basin Plans) are required for the nine state-designated hydrologic basins by the CWA and the California Porter-Cologne Water Quality Control Act. The Basin Plan for Region 6, Lahontan Basin, serves to guide and coordinate the management of water quality in this region.

1.8.2.3 CALIFORNIA ENDANGERED SPECIES ACT

The California ESA prohibits the take of listed species except as otherwise provided in California law. Unlike the federal ESA, the California ESA applies the take prohibitions to species petitioned for listing (state candidates). State lead agencies are required to consult with the CDFW to ensure that any actions undertaken by that lead agency are not likely to jeopardize the continued existence of any state-listed species or result in destruction or degradation of required habitat.

1.8.3 LOCAL POLICY AND LAND USE PLAN CONFORMANCE

1.8.3.1 INYO COUNTY GENERAL PLAN AND LAND USE ORDINANCE

The Inyo County General Plan provides the Land Use and Conservation and Open Space Elements that establish goals and policies for the Inyo County land use designations. Any development within the jurisdiction of the County must be consistent with the General Plan and the Land Use Ordinance. BLM-managed lands and areas of the proposed project / proposed action not located on BLM land must be consistent with the intent of the General Plan.

1.9 AVAILABILITY OF REPORTS

Copies of this EIR/EA and appendices are available during the public review period at the following libraries:

Independence Library, 168 North Edwards Street, Independence, CA 93526
Telephone number: (760) 878-0260
Hours of operation: Monday, Tuesday, Thursday, and Friday (12:00 p.m.–8:00 p.m.)
Wednesday (6:00 p.m.–9:00 p.m.)
Saturday (10:00 a.m.–1:00 p.m.)

Big Pine Library, 500 South Main Street, Big Pine, CA 93513
Telephone number: (760) 938-2420
Hours of operation: Monday, Tuesday, Thursday, and Friday (12:00 p.m.–5:00 p.m.)
Wednesday (2:00 p.m.–7:00 p.m.)
Saturday (10:00 a.m.–12:00 p.m. and 1:00 p.m.–5:00 p.m.)

Bishop Library, 210 Academy Avenue, Bishop, CA 93514
Telephone number: (760) 873-5115
Hours of operation: Monday, Wednesday, and Friday (10:00 a.m.–6:00 p.m.)
Tuesday and Thursday (12:00 a.m.–8:00 p.m.)
Saturday (10:00 a.m.–4:00 p.m.)

Lone Pine Library, Intersection of Washington and Bush Streets, Lone Pine, CA 93545
Telephone number: (760) 876-5031
Hours of operation: Monday and Wednesday (12:30 p.m.–7:00 p.m.)
Tuesday and Thursday through Saturday (10:00 a.m.–12:00 p.m. and 1:00 p.m.–5:00 p.m.)

The EIR/EA and supporting materials will also be available for review at the following locations:

Great Basin Unified Air Pollution Control District
157 Short Street
Bishop, CA 93514-3537
Contact Ms. Tori DeHaven
for an appointment at (760) 872-8211
Available online at: http://www.gbuapcd.org/

Bureau of Land Management Bishop Field Office
351 Pacu Lane, Suite 100, Bishop, CA 93514-3537
Contact Mr. Steve Nelson, Field Manager,
for an appointment at (760) 872-5011

Sapphos Environmental, Inc.
430 North Halstead Street
Pasadena, CA 91107
Contact Ms. Marie Campbell
for an appointment at (626) 683-3547

Written comments on this EIR/EA should be transmitted during the public review period to Mr. Theodore D. Schade, Great Basin Unified Air Pollution Control District, 157 Short Street, Bishop, California 93514-3537.

1.10 ORGANIZATION AND CONTENT

This EIR/EA consists of the following sections:

- **Section 1, Introduction,** provides information related to the purpose and scope of the EIR/EA, environmental review process, and the organization and content of the EIR/EA. The introduction further provides the location and boundaries of the proposed project / proposed action; including the general location in Inyo County and township, range, and section specifications; and purpose and need for the proposed project / proposed action.

- **Section 2, Proposed Project / Proposed Action and Alternatives,** provides a description of the technical and environmental characteristics of the proposed project / proposed action and alternatives, including the supporting project elements and construction scenario.

- **Section 3, Environmental Setting,** addresses existing conditions, or environmental setting, of the proposed project / proposed action and alternatives. The environmental setting is described in accordance with CEQA and NEPA. As required by CEQA, the physical conditions existing at the time that the NOP and NOI are published are used for the basis of the evaluation.

- **Section 4, Environmental Consequences,** will evaluate the environmental consequences (direct and indirect impacts) associated with the implementation of the proposed project / proposed action and alternatives and identifies available mitigation measures to reduce significant impacts.

- **Section 5, Cumulative Impacts,** examines the cumulative environmental consequence of the proposed project / proposed action in conjunction with other related projects.

- **Section 6, Other CEQA Required Considerations,** includes an analysis of significant irreversible environmental changes, growth inducing impacts, and unavoidable significant environmental impacts.

- **Section 7, Effects Found Not to Be Significant,** will briefly describe any potential environmental effects that were determined not to be significant during the initial project scoping and, therefore, were not discussed in detail in the EIR.

- **Section 8, Consultation and Coordination,** provides a list of all governmental agencies, community groups, and other organizations consulted during the preparation of this EIR/EA. This section also provides a list of all personnel that provided technical input to this EIR/EA.

- **Section 9, References,** lists all sources, communications, and correspondence used in the preparation of this EIR/EA.

- **Appendices**

  A Notice of Preparation
  B Visual Resources Technical Report
  C Air Quality and Greenhouse Gas Emissions Technical Report
  D Biological Resources Technical Report
  E Cultural Resources Technical Report
  F Paleontological Survey Report
  G Phase I Environmental Site Assessment
  H Traffic Impact Study
  I Keeler Dunes Investigation: Project Study Plan
  J Keeler Dunes Project Irrigation System Analysis
  K Using Roughness (Solid Elements and Plants) to Control Sand Movement and Dust Emissions: Keeler Dunes Dust Demonstration Project, Interim Report
  L Preliminary Results of Plant Establishment in the Straw Bale Demonstration Dust Control Project

1.11 ISSUES TO BE ADDRESSED

1.11.1 CEQA EIR

The issues evaluated in this EIR include the physical, biological, cultural, recreational, and other resources that have the potential to be affected by the activities related to the proposed project and alternatives. The District reviewed previous Initial Studies and EIRs prepared for the analysis of environmental issues associated with dust control activities at Owens Lake,[29,30,31] analyzed a variety of potential DCMs applicable to the proposed project area, and conducted public information meetings to disseminate information of ongoing research.[32,33] In accordance with CEQA Guidelines Section 15060(d), "if a lead agency can determine that an EIR will be clearly required for a project, the agency may skip the initial review of the project and begin work directly on the EIR process." As a result of its review of past work, the District determined that the proposed project may result in significant impacts to 10 environmental resources warranting further analysis necessitating the preparation of an EIR. The District determined that, pursuant to the CEQA, an EIR

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[29] Great Basin Unified Air Pollution Control District. January 2008. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan—Integrated Subsequent Environmental Impact Report*. State Clearinghouse Number 2007021127. Prepared by Sapphos Environmental, Inc. Pasadena, CA.

[30] Great Basin Unified Air Pollution Control District. February 2004. *2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Integrated Environmental Impact Report*. State Clearinghouse House No. 2002111020. Prepared by: Sapphos Environmental, Inc., Pasadena, CA. Bishop, CA.

[31] Great Basin Unified Air Pollution Control District. February 2007. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Initial Study*. State Clearinghouse Number 2007021127. Bishop, CA.

[32] Great Basin Unified Air Pollution Control District. 2011. *Preliminary Constraints Analysis*. Prepared by: Sapphos Environmental, Inc., Pasadena, CA. Bishop, CA.

[33] Great Basin Unified Air Pollution Control District. 2011. "Public Meeting Presentation Materials for January 20, 2010 and August 24, 2011 Public Meetings." Available at: http://www.gbuapcd.org/keelerdunes/reports/index.htm

is the appropriate environmental document to support the decision-making process to be undertaken by the Governing Board in relation to the proposed project.

The issue areas analyzed in the EIR are:

- Aesthetics / Visual Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Geology and Soils
- Greenhouse Gases / Global Climate Change
- Hydrology and Water Quality
- Land Use and Planning
- Recreation
- Transportation and Traffic

1.11.2 NEPA EA

Working in concert with District staff, the BLM determined that an EA pursuant to the NEPA would be the appropriate environmental document to support the decision-making process related to the proposed ROW by the Bishop Field Manager. The following issue areas for the EA will be addressed in the context of the EA/EIR:

- Air Quality
- Biological Resources
- Cultural Resources Including Native American Cultural Values
- Paleontological Resources
- Floodplains
- Global Climate Change
- Invasive, Non-native Species
- Soils
- Vegetation
- Visual
- Water Quality
- Wetlands
- Wilderness Including the Inventory of Wilderness Characteristics

1.12 ISSUES SCOPED OUT FROM FURTHER ENVIRONMENTAL REVIEW

1.12.1 CEQA

In accordance with CEQA Guidelines Section 15060(d), the lead agency decided to begin work directly on the EIR process for the proposed project and must "indicate briefly its reasons for determining that other effects would not be significant or potentially significant." The District determined, based on its extensive knowledge of the project study area and on input from multiple public meetings, that there was no evidence that the proposed project would cause significant environmental effects related to seven environmental resources included in the CEQA Guidelines Appendix G.

1.12.1.1 AGRICULTURE AND FORESTRY RESOURCES

An impact analysis was undertaken to determine if the proposed project may have a significant impact to agriculture and forestry that would require the consideration of mitigation measures or alternatives in accordance with Section 15063 of the State CEQA Guidelines.[34] The project site consists of a sand sheet and active sand dunes. Agricultural resources at the proposed project site were evaluated with regard to the California Department of Conservation Farmland Mapping and Monitoring Program.[35]

Would the proposed project have any of the following effects:

(a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use that exceeds the California LESA Model Scoring Thresholds?

The proposed project would not be expected to result in impacts to agricultural resources in relation to the conversion of farmland. There are no designated or proposed prime farmlands, unique farmlands, farmlands of statewide importance, or any existing farmlands present at the proposed project site.[36] The California Department of Conservation's Farmland Mapping and Monitoring Program (FMMP) has not mapped Inyo County as part of the FMMP.[37] Therefore, the land within the project study area is not designated farmland pursuant to the FMMP. No conversion of designated farmland would occur as part of the proposed project. In addition, the Bishop RMP does not designate any areas of Inyo County as prime or unique agricultural or farmlands.[38] Therefore, there would be no expected impacts to agricultural resources related to the conversion of farmland. No further analysis is warranted.

(b) Conflict with existing zoning for agricultural use or a Williamson Act contract?

The proposed project would not be expected to result in impacts to agricultural resources in relation to a conflict with existing zoning for agriculture, or a Williamson Act contract. The County of Inyo General Plan land use designation for the proposed project area is Open Space.[39] There are no parcels zoned for or used for agriculture, nor are state lands subject to the Williamson Act.[40,41]

[34] *California Code of Regulations*. Title 14, Division 6, Chapter 3, Sections 15000–15387, Appendix G.

[35] California Department of Conservation, Division of Land Resource Protection, Farmland Mapping and Monitoring Program. 2004. *Important Farmland in California, 2002*. Sacramento, CA.

[36] Inyo County Planning Department. December 2001. *Inyo County General Plan, Conservation and Open Space Element*. Independence, CA.

[37] California Department of Conservation, Division of Land Resource Protection, Farmland Mapping and Monitoring Program. Accessed 3 October 2012. Available at: http://www.conservation.ca.gov/DLRP/fmmp/Pages/Index.aspx

[38] Bureau of Land Management, Bakersfield District. April 1993. *Bishop Resource Management Plan Record of Decision*. Bakersfield, CA.

[39] Inyo County Planning Department. December 2001. *Inyo County General Plan, Conservation and Open Space Element*. Independence, CA.

[40] City of Los Angeles Department of Water and Power. February 2000. *Initial Study for North Sand Sheet Shallow Flooding Project; Owens Lake Dust Mitigation Program, Owens Lake, California*. Prepared by: CH2M HILL, Santa Ana, CA.

Therefore, there would be no expected impacts to agricultural resources related to a conflict with existing zoning for agricultural use or a Williamson Act contract. No further analysis is warranted.

(c) Conflict with existing zoning for, or cause rezoning of, forest land or timberland?

The proposed project would not conflict with existing zoning for, or cause rezoning of, forest land or timberland. There is no zoned forest land or timberland present at the proposed project site. No further analysis is warranted.

(d) Result in the loss of forest land or conversion of forest land to non-forest use?

The proposed project would not be expected to result in the loss of forest land or conversion of forest land to non-forest use. There is no forest land present at the proposed project site. No further analysis is warranted.

(e) Involve other changes in the existing environment that, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?

The proposed project would not be expected to result in impacts to agricultural resources in relation to changes in the existing environment that, due to their location or nature, could result in conversion of farmland to non-agricultural use. As stated above, no farmland or forest is present on or adjacent to the proposed project site. Therefore, there would be no expected impacts to agricultural resources related to changes in the existing environment that, due to their location or nature, could result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest use. No further analysis is warranted.

1.12.1.2 HAZARDS AND HAZARDOUS MATERIALS

The project site is currently an undeveloped area, although historical records indicate that in 1883, the narrow-gauge Carson & Colorado Railroad was built to Keeler, California, and transects the property north to south between the Old Highway and SR 136.[42] The railroad operated until 1960, when it was abandoned and removed. Based on a review of available historical topographic maps and aerial photographs, a government regulatory database records search of hazardous waste sites, and a site walkover, development of the project site was limited to the narrow gauge railroad. The government regulatory database compilation identified one solid waste facility within a 1-mile radius of the proposed project area referred to as the Keeler Disposal Site, a former landfill located approximately 1/8 mile southeast on Old Highway 136. The address is incorrectly reported as Olancha Dump Road.[43] Records indicate this facility operated between 1973 and 1991 and accepted inert and nonhazardous solid waste from the community of Keeler. The facility was located on land owned by the LADWP and was operated by the County of Inyo Integrated Waste Management. The Keeler transfer station, also operated by the County, is currently located on the

[41] City of Los Angeles Department of Water and Power. August 2001. *Mitigated Negative Declaration Southern Zones Dust Control Project, Owens Lake Dust Mitigation Program, Owens Lake, California*. Prepared by CH2M HILL, Santa Ana, CA.

[45] *Code of Federal Regulations*, Title 40, Chapter 1, Part 261.

[45] *Code of Federal Regulations*, Title 40, Chapter 1, Part 261.

site of the former landfill.[44] Records indicate the former landfill was properly closed in accordance with the requirements of the Lahontan RWQCB.

An impact analysis was undertaken to determine if the proposed project may have a significant impact to hazards and hazardous materials, thus requiring the consideration of mitigation measures or alternatives, in accordance with Section 15063 of the State CEQA Guidelines.

Hazardous wastes are by-products of society that can pose a substantial or potential hazard to human health or the environment when improperly managed. Hazardous wastes possess at least one of four characteristics (ignitability, corrosivity, reactivity, or toxicity), or appear on special Environmental Protection Agency lists.[45] Hazards and hazardous materials at the proposed project site were evaluated based on expert opinion supported by facts, a review of environmental databases[46] and additional technical reports, and environmental investigations related to the proposed project site. State CEQA Guidelines recommend the consideration of eight questions when addressing the potential for significant impact to hazards and hazardous materials.

Would the proposed project:

(a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

The impact from hazards and hazardous materials related to creating a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials from the proposed project would be expected to be below the level of significance. The proposed project do not involve the use of hazardous materials. The proposed project consists of installation and monitoring for dust control measures, using straw bales and native vegetation on up to 194 acres in a study area consisting of 870 acres of destabilized sand deposits. The project construction would require four staging areas and an access route from each of the staging areas to the project site. The proposed project does not involve the routine transport, use, or disposal of hazardous materials, other than fuel and oil used in project vehicles and equipment during project construction. No hazardous or solid waste would be generated within the project area. Routine transport, use, and storage of hazardous materials during proposed project operations will not result in their potential exposure to people or the environment. Impacts from hazards and hazardous materials in relation to creating a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials would be expected to be below the level of significance. Further analysis is required.

(b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous material into the environment?

The impact from hazards and hazardous materials related to the creation of a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous material from the proposed project would be expected to be below the level of significance. The proposed project would not involve the transport, use, or

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[45] *Code of Federal Regulations*, Title 40, Chapter 1, Part 261.

[45] *Code of Federal Regulations*, Title 40, Chapter 1, Part 261.

[46] Environmental Data Resources, Inc. 6 July 2005. *EDR Report for Rancho Los Amigos NRC South Campus, Downey, CA 90242*. Inquiry No. 1460019.2s. Milford, CT.

disposal of hazardous materials, other than fuel and oil used in project vehicles and equipment during project construction. No hazardous or solid waste would be generated within the project area. No hazard will be posed to the public and the environment by the presence of hazardous materials during the construction or operation of the proposed project because no hazardous materials will be transported, used, or disposed at the proposed project. Therefore, impacts from hazards and hazardous materials in relation to the creation of a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous material would below the level of significance with the incorporation of project design and BMPs. No further analysis is required.

(c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

The impact from hazards and hazardous materials with respect to the emission of hazardous emissions or the handling of hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school from the proposed project would be expected to be below the level of significance. There are no schools within 0.25 mile of the proposed project site. The nearest school to the proposed project is Lone Pine High School in Lone Pine, California, over 10 miles to the northwest.[47] Impacts from hazards and hazardous materials with respect to the emission of hazardous emissions or the handling of hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school would be below the level of significance. No further analysis is required.

(d) Be located on a site that is included on a list of hazardous materials sites compiled pursuant to the Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment?

Impacts from hazards and hazardous materials related to the proposed project being located on a site that is included on a list as a hazardous materials site would be expected to be below the level of significance with mitigation. Government database listings of hazardous materials were reviewed to determine the locations of hazardous materials sites within 0.5 mile of the proposed project study area. Based on the review of a recent compilation of environmental regulatory databases,[48] there are no hazardous waste sites pursuant to Government Code Section 65962.5. Therefore, the proposed project's impacts from hazards and hazardous materials related to location on a hazardous waste site would be expected to be below the level of significance. No further analysis is warranted.

(e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?

The proposed project would not be expected to result in impacts from hazards and hazardous materials in relation to the proximity from an airport and the safety hazard for people residing or working in the proposed project area. No airports are located in the vicinity of the proposed project area. Therefore, there are no expected impacts from hazards and hazardous materials in

[47] The Thomas Guide. 2001. California Road Atlas & Driver's Guide.

[48] Environmental Data Resources, Inc. 14 May 2013. *The EDR Radius Map Report with Geocheck, Rancho Los Amigos National Rehabilitation Center, 7601 East Imperial Highway, Downey, CA 90242*. Inquiry No. 3605501.1s. Milford, CT.

relation to the proximity from an airport and the safety hazard for people residing or working in the proposed project area. No further analysis is warranted.

(f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?

The proposed project would not be expected to result in impacts from hazards and hazardous materials due to being within the vicinity of a private airstrip and the potential for safety hazards for people residing or working in the proposed project area. There are no private airstrips located in the vicinity of the proposed project area. Therefore, there would be no expected impacts from hazards and hazardous materials due to the proposed project being within the vicinity of a private airstrip and the potential for safety hazards for people residing or working in the proposed project area. No further analysis is warranted.

(g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

The proposed project would not be expected to result in impacts from hazards and hazardous materials from impairing the implementation of or physically interfering with an adopted emergency response plan or emergency evacuation plan. The County of Inyo currently does not have an adopted emergency response plan or emergency evacuation plan.[49] In the event of emergency, the County Fire Department would evaluate the situation and, if necessary, would evacuate the areas determined to be the most likely to be affected. Therefore, there would be no expected impacts from hazards and hazardous materials that would impair the implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. No further analysis is warranted.

(h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

The proposed project would not be expected to result in impacts from hazards and hazardous materials that would expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands. The proposed project is located entirely within a non-urbanized, undeveloped wildlands area. The proposed project site is not located within a Fire Hazard Severity Zone.[50] Therefore, there would be no expected impacts from exposure of people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands. No further analysis is warranted.

1.12.1.3 MINERAL RESOURCES

An impact analysis was undertaken to determine if the proposed project may have a significant impact to mineral resources, thus requiring the consideration of mitigation measures or alternatives, in accordance with Section 15063 of the State CEQA Guidelines. Mineral resources at the proposed

[49] County of Inyo Planning Department. March 2012. General Plan Annual Progress Report 2011.

[50] California Department of Forestry and Fire Protection. 2007. Fire Hazard Severity Zones Maps. Sacramento, CA. Available at: http://www.fire.ca.gov/wildland_zones.php

project site were evaluated with regard to California Division of Mines and Geology publications,[51,52] the Inyo County General Plan,[53] and various published studies. The State CEQA Guidelines recommend the consideration of two questions when addressing the potential for significant impact to mineral resources.

Would the proposed project have either of the following effects:

(a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

The proposed project would not be expected to result in potentially significant impacts to mineral resources in relation to the loss of availability of a known mineral resource of value to the State of California. Based on a review of California Division of Mines and Geology publications and available literature, there are known mineral resources of statewide or regional importance located within Owens Valley, but not within the project study area.[54,55] Inyo County is rich in mineral resources, with over 150 minerals identified in the last century.[56] Minerals in the Inyo Mountains immediately to the east of the proposed project study area include gold, silver, lead, zinc, tungsten, talc, and bismuth.[57] The proposed project study area is located in or adjacent to an alluvial plane expanding west out of the Inyo Mountains. Trace amounts of valued mineral resources may have been transported into the proposed project study area through the alluvial plane, but there are no substantial mineral resources identified within the proposed project study area.

Historically, Keeler and the Owens Lake area have been used for talc processing, salt extraction, and soda ash processing; however, Rio Tinto Minerals (U.S. Borax) is the only current mineral extraction company operating at Owens Lake.[58,59] The existing mineral lease is held by Rio Tinto Minerals–Owens Lake Operations (referred to as the U.S. Borax Lease by the California State Lands Commission), which mines trona (sodium carbonate and sodium bicarbonate mineral) and leases a large area at the central portion of Owens Lake nearly 10 miles southwest of the project area for mineral extraction activities. There are no active mineral resource recovery sites within the proposed project site.[60,61] The proposed project site is located on young sediments located a considerable

[51] California Division of Conservation, Division of Mines and Geology. 1966. *Minerals of California Volume (1866-1966). Bulletin 189*. Los Angeles, CA.

[52] California Division of Conservation, Division of Mines and Geology. 1990. *Mines and Mineral Producers Active in California (1988-89). Special Publication 103.* Los Angeles, CA.

[53] Inyo County Planning Department. 2013. *Inyo County General Plan, Conservation and Open Space Element.* Independence, CA.

[54] California Division of Conservation, Division of Mines and Geology. 1966. *Minerals of California Volume (1866-1966). Bulletin 189*. Los Angeles, CA.

[55] California Division of Conservation, Division of Mines and Geology. 1990. *Mines and Mineral Producers Active in California (1988-89). Special Publication 103.* Los Angeles, CA.

[56] California Division of Conservation, Division of Mines and Geology. 1966. *Minerals of California Volume (1866-1966). Bulletin 189*. Los Angeles, CA.

[57] Conrad, J., Kilburn, J., Blakely, R. 1987. "Mineral Resources of the Southern Inyo Wilderness Study Area, Inyo County, California." *U.S. Geological Survey Bulletin 1705-B*. Washington D.C.

[58] Sapphos Environmental, Inc. 2012. *Keeler Dunes Dust Control Project Cultural Resources Technical Report*. Pasadena, CA.

[59] U.S. Borax. "Key Facts." Available at: http://www.borax.com/about-borax/key-facts

[60] "Active Mines and Plants, Inyo County." Available at: http://active-mines.findthedata.org/d/d/California/Inyo

[61] Inyo County Planning Department. 2013. *Inyo County General Plan, Conservation and Open Space Element.* Independence, CA.

distance from valuable mineral-bearing rocks in the Inyo Mountains. Although soda ash mining has historically occurred in the area of the project site, the only current mineral extraction operation on Owens Lake is located nearly 10 miles southwest of the project site.[62] Therefore, there would be no expected impacts to mineral resources related to the loss of availability of a known mineral resource recovery site important to the State of California. No further analysis is warranted.

(b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

The proposed project would not be expected to result in impacts to mineral resources in relation to the loss of availability of a known mineral resource recovery site. Based on a review of California Division of Mines and Geology publications, parts of Inyo County and the Owens Valley are rich in mineral deposits. Several existing active mines surround the Owens Lake bed area, including sources of aggregate materials, dolomite, and decomposed granite.[63] However, according to the Conservation and Open Space element of the Inyo County General Plan,[64] there are no known mineral resource recovery sites of local importance located within the proposed project study area. The proposed project study area is designated by the Inyo County Zoning Code as OS – 40 - Open Space, 40-Acre Minimum.[65] The proposed project area is zoned Open Space in the Inyo County Zoning Ordinance. The proposed project is considered Agricultural, which is a permitted use in the Open Space Zone.[66] Therefore, there would be no expected impacts to mineral resources related to the loss of availability of a known locally important mineral resource recovery site. No further analysis is warranted.

1.12.1.4 NOISE

The DCMs would not require the development of permanent facilities, such as buildings or other infrastructure, or increase traffic to the project site that could result in noise impacts. An impact analysis was undertaken to determine if the proposed project may have a significant impact to noise, thus requiring the consideration of mitigation measures or alternatives, in accordance with Section 15063 of the State CEQA Guidelines.[67] Noise at the proposed project site was evaluated with regard to the Noise Element of the Inyo County General Plan.[68]

The ambient noise in the vicinity of the project are primarily characterized by adjacent roadways, including California Highway 136 and Old State Highway, which both intersect with the project site. The State CEQA Guidelines recommend the consideration of six questions when addressing the potential for significant impact to noise.

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[62] Inyo County Planning Department. 2013. *Inyo County Zoning Code*. Independence, CA.

[63] California Department of Conservation, Division of Mines and Geology. 1999. *Mines and Mineral Producers Active in California (1997–1998)*. Special Publication 103. Sacramento, CA.

[64] Inyo County Planning Department. 2013. *Inyo County General Plan, Conservation and Open Space Element*. Independence, CA.

[65] Inyo County Planning Department. 2013. *Inyo County Zoning Code*. Independence, CA.

[66] Great Basin Unified Air Pollution Control District September 13, 2013 email regarding discussion with Josh Hart, Inyo County Planning Director.

[67] *California Code of Regulations*. Title 14, Division 6, Chapter 3, Sections 15000–15387, Appendix G.

[68] County of Inyo, Inyo County Planning Department, *Noise Element of the General Plan*. December 2001.

Would the proposed project have any of the following effects:

(a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

The proposed project is expected to result in less than significant impacts to noise in relation to exposure or generation of noise levels in excess of established standards. The proposed project consists of installation and monitoring for DCMs, consisting of straw bales and native vegetation, on up to 194 acres in a study area consisting of 870 acres of destabilized sand deposits. The project construction would require four staging areas and an access route from each staging area to the project site. There are no structures of commercial establishments associated with the proposed project.

The construction phase of the proposed project is anticipated to require up to 11 months. During this time period, workers and delivery vehicles, all-terrain vehicles (ATVs), and other equipment will be operating on site. However, noise impacts to residents are not expected to be significant because all site access would occur approximately 0.4 mile from the nearest resident, and construction work will comply with the Noise Element of the Inyo County General Plan as well as all relevant codes and ordinances. Therefore, the proposed project is expected to result in less than significant impacts in relation to exposure or generation of noise levels in excess of established standards.

(b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

The proposed project is expected to result in less than significant impacts to noise in relation to generation of excessive groundborne vibration or groundborne noise. Significant groundborne vibrations generally occur as a result of construction activities such as blasting, pile-driving, and operating heavy earth-moving equipment. Due to the nature of the proposed project, groundborne vibrations are expected to be negligible and only occur as a result of infrequent vehicular traffic during construction and maintenance of DCM. Additionally, the groundborne vibration impacts to residents are not expected to be significant because all site access would occur approximately 0.4 mile away. Therefore, the proposed project is expected to result in less than significant impacts in relation to exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

(c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

The proposed project is expected to result in less than significant impacts to noise in relation to permanent increases in ambient noise levels. The Inyo County General Plan's Noise Element would regulate all future ambient noise associated with the proposed project. Although the construction phase of the proposed project may result in intermittent increases in ambient noise levels from construction equipment, operation and maintenance of the DCM would require minimal usage of construction equipment, and thus not result in a substantial permanent increase in ambient noise levels in the vicinity of the proposed project.

(d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity about levels existing without the project?

The proposed project is expected to result in less than significant impacts to noise in relation to temporary or periodic increases in ambient noise levels. As discussed above, the proposed project is expected to result in intermittent increases in ambient noise levels during construction of DCM, and minimal noise from operations and maintenance. Therefore, due to the nature of the proposed project, increases in temporary or periodic ambient noise levels are expected to be less than significant.

(e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

The proposed project is not expected to result in impacts to noise in relation to public airports. The nearest public use airport is the Lone Pine Airport located approximately 9.7 miles northwest from the proposed project boundary. The proposed project would not increase noise levels in the vicinity of the airport, alter air traffic patterns, or conflict with Federal Aviation Administration (FAA) regulations, including established FAA flight protection zones. Therefore, there are no expected impacts to noise related to public airports, and no further analysis is warranted.

(f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

The proposed project is not expected to result in impacts to noise in relation to private airstrips. The nearest private airstrip is Saline Valley Airstrip, located approximately 26.9 miles (northeast) from the proposed project boundary. The proposed project is not within the vicinity of a private airstrip and would not expose people residing or working in the project area to excessive noise levels. Therefore, there are no expected impacts to noise related to private airstrips, and no further analysis is warranted.

1.12.1.5 POPULATION AND HOUSING

An impact analysis was undertaken to determine if the proposed project may have a significant impact to population and housing that would require the consideration of mitigation measures or alternatives in accordance with Section 15063 of the State CEQA Guidelines.[69] The DCMs would not provide housing or infrastructure that would cause a substantial population growth in the Keeler area. The project site is undeveloped, and implementation of DCMs would not displace substantial numbers of people. The State CEQA Guidelines recommend the consideration of three questions when addressing the potential for significant impacts to population and housing.

Would the proposed project have any of the following effects:

(a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

[69] *California Code of Regulations*. Title 14, Division 6, Chapter 3, Sections 15000–15387, Appendix G.

The proposed project would not be expected to result in the creation of new housing or infrastructure that would induce or accelerate population or household growth. The proposed dust control measures would provide a small number of temporary employment opportunities during construction. These jobs would be expected to be filled with the local workforce in the surrounding communities; therefore, no indirect population growth is anticipated. The proposed project is a program to implement dust control measures to comply with national ambient air quality standards; no new homes or businesses are proposed as a part of the proposed project.

No growth-inducing extensions of infrastructure, including roadways, are proposed as a part of the proposed project. The proposed project would not affect the existing supply or demand for permanent housing or rental housing in the community of Keeler or surrounding communities. There is little need for future housing near the proposed project study area, as the nearby community of Keeler contains 67 housing units, 40 percent of which were recorded as vacant in the 2010 Census.[70] The population in Inyo County is forecasted by the California Department of Transportation to grow at a slow average rate of 1.0 percent per year from 2012 to 2017, which indicates a low future housing need within the land surrounding Owens Lake.[71,72] As such, the proposed project would not be expected to stimulate population growth beyond that already projected to occur. Therefore, the proposed project is not expected to result in significant impacts to population growth. No further analysis is warranted.

(b) Displace substantial amounts of existing housing, necessitating the construction of replacement housing elsewhere?

The proposed project would not result in adverse impacts to population and housing in relation to the displacement of substantial amounts of existing housing, necessitating the construction of replacement housing elsewhere. There are currently no housing units located within the boundary of the proposed project study area or within 650 feet of the boundary; therefore, no housing units would be removed. The proposed project would not alter the location, distribution, density, or growth of the population in the area. Therefore, the proposed project is not expected to result in impacts to population and housing related to displacement of housing necessitating the construction of replacement housing. No further analysis is warranted.

(c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

The proposed project would not result in adverse impacts to population and housing related to the displacement of substantial numbers of people, necessitating the construction of replacement housing elsewhere. Implementation of the proposed project includes the construction of dust control measures, including temporary dune stabilization with straw bales, establishing native vegetation, and building temporary access routes and staging areas during project construction. No

[70] United States Census Bureau. 15 July 2013. "American Fact Finder: General Housing Characteristics: 2010". QT-H1. 2010 Census. Geography: Keeler CDP, California. Available at: http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=DEC_10_SF1_QTH1&prodType=table Main website: http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml

[71] California Department of Transportation. 15 July 2013. "Inyo County Economic Forecast". PDF available from website: http://www.dot.ca.gov/hq/tpp/offices/eab/socio_economic_files/2012/Inyo.pdf#zoom=65 PDF from 2012. Main website: http://www.dot.ca.gov/hq/tpp/offices/eab/socio_economic.html

[72] California Department of Transportation. 15 July 2013. "Inyo County Economic Forecast". PDF available from website: http://www.dot.ca.gov/hq/tpp/offices/eab/socio_economic_files/2011/Inyo.pdf PDF from 2011. Main website: http://www.dot.ca.gov/hq/tpp/offices/eab/socio_economic.html

residential buildings would be demolished as part of the proposed project. As such, there would be no displacement of any person or persons. Therefore, there would be no impacts to population and housing in relation to the displacement of substantial numbers of people, necessitating the construction of replacement housing elsewhere. No further analysis is warranted.

1.12.1.6 PUBLIC SERVICES

The proposed project is a program to control dust emissions and would not provide housing, commercial development, infrastructure, and so forth that would result in a need for new or physically altered governmental agencies for fire/police protection, schools, or other public facilities. An impact analysis is undertaken to determine if the proposed project may have a significant impact to public services that would require the consideration of mitigation measures or alternatives in accordance with Section 15063 of the State CEQA Guidelines.[73] State CEQA Guidelines recommend consideration of one question when addressing the potential for significant impacts to public services.

Would the proposed project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

1. Fire protection?

The proposed project would not be expected to result in significant impacts to public services in relation to fire protection. The proposed dust control measures would not entail the construction of housing, commercial space, or other developments that would substantially affect the provision of fire protection services. Construction workers are anticipated to be supplied locally from surrounding communities and would cause only a temporary increase in the daytime population of the community of Keeler. The California Department of Forestry and Fire Protection (CAL FIRE) is responsible for fire protection for the nearby community of Keeler and land owned by the LADWP and Southern Pacific Railroad within the southern and southwestern edges of the proposed project boundary.[74] The BLM owns and holds responsibility for fire protection of the remaining majority of the proposed project site.[75] Cooperation for fire protection services during a large wildfire within or near the project boundary would occur between the BLM, CAL FIRE, LADWP, Lone Pine Volunteer Fire Department, U.S. Forest Service, and Inyo County Sheriff.[76,77] The Keeler Volunteer Fire Department provides fire protection to the community of Keeler from a small fire station located 0.7 mile southeast from the proposed project study area on Old State Highway, and the

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[73] *California Code of Regulations*. Title 14, Division 6, Chapter 3, Sections 15000–15387, Appendix G.

[74] State of California 19 July 2013. "Fire Hazard Severity Zones in SRA" map. Adopted by CAL FIRE on 7 November 2007. PDF available at: http://frap.cdf.ca.gov/webdata/maps/inyo/fhszs_map.14.pdf Main website: http://calfire.ca.gov/index.php

[75] State of California 19 July 2013. "Fire Hazard Severity Zones in SRA" map. Adopted by CAL FIRE on 7 November 2007. PDF available at: http://frap.cdf.ca.gov/webdata/maps/inyo/fhszs_map.14.pdf Main website: http://calfire.ca.gov/index.php

[76] State of California. 19 July 2013. "River Fire Incident Information". Website. Last modified 28 February 2013. Available at: http://cdfdata.fire.ca.gov/incidents/incidents_details_info?incident_id=769

[77] Inyo County Planning Department. 15 July 2013. "Inyo County General Plan: Guide to Inyo County Communities". Last updated December 2001. Website. Available at: http://www.inyoplanning.org/general_plan/index.htm Page 4-30 of PDF.

Lone Pine Fire District provides fire protection and ambulance services to communities within the area from the Lone Pine Fire Department station, located approximately 12 miles northwest of the proposed project boundary.[78,79] Construction would not significantly affect fire protection response times because temporary access routes and staging areas would be located along Old State Highway instead of California State Route 136 to reduce traffic impacts. Periodic maintenance and monitoring of the proposed project would not create a substantial increase in population in the area. Therefore, the proposed project is not expected to result in significant impacts to public fire protection services, and no further analysis is warranted.

2. Police protection?

The proposed project would not be expected to result in significant impacts to public services in relation to police protection. The proposed dust control measures would not entail the construction of housing, commercial space, or other developments that would substantially affect the provision of police protection services. Construction workers are anticipated to be supplied locally from surrounding communities and would cause only a temporary increase in the daytime population of the community of Keeler. Police protection is provided by the Inyo County Sheriff's Department.[80] An Inyo Sheriff Station is located in the community of Lone Pine approximately 12 miles northwest of the project study area.[81] Construction would not affect police protection response times because temporary access routes and staging areas would be located along Old State Highway instead of California State Route 136 to reduce traffic impacts. Periodic maintenance and monitoring of the proposed project would not create a substantial increase in population in the area. Therefore, the proposed project is not expected to result in significant impacts to public police protection services, and no further analysis is warranted.

3. Schools?

The proposed project would not be expected to result in significant impacts to public services in relation to schools. The proposed dust control measures would not entail the construction of housing or other developments that would substantially affect the provision of schools. Construction workers are anticipated to be supplied locally from surrounding communities and would cause only a temporary increase in the daytime population of the community of Keeler. The Lone Pine Unified School District serves the communities surrounding the proposed project study area, including Keeler, Olancha, and Lone Pine.[82] Lo-Inyo Elementary School and Lone Pine High School, which are both located approximately 12 miles northwest of the project study area in the community of Lone Pine, provide K-12 education for Lone Pine and the surrounding rural

[78] Inyo County Planning Department. 15 July 2013. "Inyo County General Plan: Guide to Inyo County Communities". Last updated December 2001. Website. Available at: http://www.inyoplanning.org/general_plan/index.htm Page 4-30 of PDF.

[79] Inyo County Planning Department. 15 July 2013. "Inyo County General Plan: Guide to Inyo County Communities". Last updated December 2001. Website. Available at: http://www.inyoplanning.org/general_plan/index.htm Page 2-17 of PDF.

[80] Inyo County Planning Department. 15 July 2013. "Inyo County General Plan: Guide to Inyo County Communities". Last updated December 2001. Website. Available at: http://www.inyoplanning.org/general_plan/index.htm Page 4-31 of PDF.

[81] Inyo County Planning Department. 15 July 2013. "Inyo County General Plan: Guide to Inyo County Communities". Last updated December 2001. Website. Available at: http://www.inyoplanning.org/general_plan/index.htm Page 4-31 of PDF.

[82] Inyo County Planning Department. 15 July 2013. "Inyo County General Plan". Last updated December 2001. Website. Available at: http://www.inyoplanning.org/general_plan/index.htm Page 2-17 to 2-22 of PDF.

communities.[83] Construction would not affect commute times from the community of Keeler to the K-12 schools in Lone Pine because temporary access routes and staging areas would be located along Old State Highway instead of California State Route 136 to reduce traffic impacts. Periodic maintenance and monitoring of the proposed project would not create a substantial increase in population in the area. Therefore, the proposed project is not expected to result in significant impacts to public school services, and no further analysis is warranted.

4. Parks?

The proposed project would not be expected to result in significant impacts to public services in relation to parks. No parks are located within the vicinity of the proposed project site. The two closest parks to the proposed project are County-maintained Diaz Lake Recreation Area and Spainhower Park (formerly Lone Pine Park), located approximately 9 and 11 miles, respectively, northwest of the proposed project site within the community of Lone Pine.[84] Diaz Lake Recreation Area contains boating, fishing, picnic, and campground facilities surrounding an 80-acre lake, whereas Spainhower Park is an active recreation park with playgrounds, shaded picnic facilities, basketball and tennis courts, a gazebo, horseshoes, and a creek running through it.[85,86] The proposed dust control measures would not entail the construction of housing, commercial space, or other developments that would substantially affect the provision of parks. Construction workers are anticipated to be supplied locally from surrounding communities and would cause only a temporary increase in the daytime population of the community of Keeler. Periodic maintenance and monitoring of the proposed project would not create a substantial increase in population in the area. Therefore, the proposed project is not expected to result in significant impacts to public services, and no further analysis related to parks is warranted.

5. Other public facilities?

The proposed project would not be expected to result in impacts to public services in relation to other public facilities. The Southern Inyo Local Healthcare District provides medical services to the area including the proposed project site, with Southern Inyo Hospital located approximately 12 miles northwest of the proposed project site in the community of Lone Pine.[87] The proposed dust control measures would not entail the construction of housing, commercial space, or other developments that would substantially affect the provision of medical services or other public facilities. Construction workers are anticipated to be supplied locally from surrounding communities and would cause only a temporary increase in the daytime population of the community of Keeler. Periodic maintenance and monitoring of the proposed project would not create a substantial increase in population in the area. Therefore, there are no expected impacts to public services related to other public facilities, and no further analysis is warranted.

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[83] Inyo County Planning Department. 15 July 2013. "Inyo County General Plan". Last updated December 2001. Website. Available at: http://www.inyoplanning.org/general_plan/index.htm Page 2-17 to 2-22 of PDF.

[84] Inyo County Planning Department. 15 July 2013. "Inyo County General Plan". Last updated December 2001. Website. Available at: http://www.inyoplanning.org/general_plan/index.htm Page 2-17 to 2-22 of PDF.

[85] Inyo County Parks and Recreation. 19 July 2013. "Diaz Lake Campground (Concessionaire Operated)". Website. Accessible at: http://www.inyocountycamping.com/diaz_lake_campground.html

[86] Inyo County Parks and Recreation. 19 July 2013. "Spainhower Park (formerly Lone Pine Park)". Website. Accessible at: http://www.inyocountycamping.com/lone_pine_park.html

[87] Southern Inyo Healthcare District. 19 July 2013. "Welcome to Southern Inyo Healthcare District". Website. Accessible at: http://www.sihd.org/getpage.php?name=index

1.12.1.7 Utilities and Service Systems

An impact analysis was undertaken to determine if the proposed project may have a significant impact to utilities and services that would require the consideration of mitigation measures or alternatives in accordance with Section 15063 of the State CEQA Guidelines.[88] The DCMs would not require permanent utilities or service systems such as wastewater treatment plants, permanent storm water drainage facilities, permanent water supply, or landfill. Therefore, this issue was scoped out from further environmental review. The State CEQA Guidelines recommend the consideration of seven questions when addressing the potential for significant impact to utilities and service systems.

Would the proposed project:

(a) Exceed wastewater treatment requirements of the applicable regional water quality control board?

Impacts to utilities and service systems related to exceeding wastewater treatment requirements of the Regional Water Quality Control Board from the proposed project would be expected to be reduced to below the level of significance with the incorporation of project design or through implementation of BMPs during construction. The proposed project would not result in the construction of new water treatment or wastewater treatment facilities. Construction crews would use portable bathrooms. Therefore, there would be no expected impacts from the proposed project to utilities and service systems resulting from the construction of new water or wastewater treatment facilities or expansion of existing facilities. No further analysis is warranted.

(b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

The proposed project would not result in the construction of new water treatment or wastewater treatment facilities. Construction crews would use portable bathrooms. Therefore, there would be no expected impacts from the proposed project to utilities and service systems resulting from the construction of new water or wastewater treatment facilities or expansion of existing facilities. No further analysis is warranted. Water for plant irrigation will be supplied from the District's 12-inch production well, located at the Fault Test Site, located about 0.7 mile northwest of the proposed project boundary. The Fault Test Site well can supply all of the project irrigation needs for the proposed project.[89] Another available water source includes purchased water from the Keeler Community Services District Well located within the proposed project / proposed action study area, approximately 0.25 miles to the southeast (Figure 2.1.5.2-3, *Water Supply*). Therefore, there would be no expected impacts from the proposed project to utilities and service systems, resulting in the construction of new water or wastewater treatment facilities. No further analysis is warranted.

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[88] *California Code of Regulations*. Title 14, Division 6, Chapter 3, Sections 15000–15387, Appendix G.

[89] Holder, G., Great Basin Unified Air Pollution Control District, Bishop, CA. 9 October 2012. Telephone conversation with D. Grotzinger, Sapphos Environmental, Inc., Pasadena, CA.

(c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental impacts?

The impact to utilities and service systems related to the construction of new storm water drainage facilities or expansion of existing facilities, which could cause significant environmental impacts from the proposed project, would be expected to be below the level of significance.The proposed project requires the placement of straw bales on top of the Keeler Dunes and the planting of native vegetation to control dust emissions. The establishment of native vegetation will require hand watering for the first three years. Water would be transferred to the small ATV water tanks directly from water trucks that would park in the staging areas for the proposed project/proposed action, and Alternatives 1 and 2. In Alternatives 3, 4, and 5, the water be distributed from temporary water tanks, water trucks, or existing wells via a temporary above-ground irrigation system. The plants will be watered by hand using ATVs and trailers traveling along temporary access routes. No storm water drainage facilities will be constructed. Therefore, no further analysis is warranted.

(d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

The impact to utilities and service systems with regard to having sufficient water supplies would be expected to be reduced to below the level of significance with the incorporation of mitigation measures. The project proposes to effectively utilize existing water supplies to facilitate the expanded dust control measures. Approximately 5 gallons of water will be applied under each straw bale prior to planting, and another 3 gallons at the time of planting.[90] Total water needs during planting are expected to amount to approximately 3.02 acre-feet (985,480 gallons). It is expected that supplemental watering will be implemented when rainfall is less than 50 percent of the average annual rainfall during the first 3 years until plants are well established. It is assumed that up to 2.26 acre-feet of water would be applied annually during this time period. The total water demand for the proposed project and alternatives is estimated at up to 9.83 acre-feet (3.2 million gallons) over a 3-year period.

The proposed project and alternatives assume that the water for plant irrigation will be supplied from the District's 12-inch production well, located at the Fault Test Site, located about 0.7 mile northwest of the proposed project boundary (Figure 2.1.5.2-3). The Fault Test Site well is an artesian (flowing) well and is capable of producing 250 gallons per minute (gpm).[91] An initial application of water at each straw bale installed in the dust control areas is expected to require approximately 985,480 gallons, which would be applied over a 2- to 4-month period. The Fault Test Site production well can supply 120,000 gallons over an 8-hour period, almost 8 times more than would be needed per day of watering. Another available water source includes purchased water from the Keeler Community Services District Well located within the proposed project / proposed action study area, approximately .25 mile to the southeast (Figure 2.1.5.2-3). No further analysis is warranted.

[90] Groeneveld, D.P., HydroBio Advanced Remote Sensing. 12 September 2012. Telephone conversation with D. Grotzinger, Sapphos Environmental, Inc., Pasadena, CA.

[91] Holder, G., Great Basin Unified Air Pollution Control District, Bishop, CA. 9 October 2012. Telephone conversation with D. Grotzinger, Sapphos Environmental, Inc., Pasadena, CA.

(e) Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

The proposed project does not require wastewater treatment through a regional provider. Construction crews would use portable bathrooms. Therefore, there would be no expected impacts from the proposed project to utilities and service systems resulting from reduced capacity of the existing wastewater treatment provider to continue to serve existing commitments. No further analysis is warranted.

(f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

Solid waste generated during construction of the proposed project would be transported to the Lone Pine Landfill, a permitted solid waste facility. Based on previous documentation, the Lone Pine Landfill has a remaining site life of approximately 15 years.[92] In addition, the proposed project would be expected to generate relatively small amounts of solid waste during construction and operation. Therefore, the proposed project would not be expected to result in significant impacts to utilities and service systems in relation to being served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs. No further analysis is warranted.

(g) Comply with federal, state, and local statutes and regulation related to solid waste?

The impact to utilities and service systems related to compliance with federal, state, and local statutes and regulations related to solid waste from the proposed project would be expected to be reduced to below the level of significance through the incorporation of project design or through implementation of BMPs. Any solid waste generated at the site would be disposed of at a permitted landfill with sufficient capacity. Therefore, impacts to utilities and service systems in relation to compliance with federal, state, and local statutes and regulations related to solid waste would be expected to be reduced to below the level of significance through compliance with the California Solid Waste Reuse and Recycling Access Act of 1991. No further analysis is warranted.

1.12.2 NEPA

There are nine resources that do not exist in the study area and therefore do not warrant analysis in the EA:

- Agricultural Land / Forestry Resources
- Essential Fish Habitat
- Farmlands, Prime or Unique
- Rangelands/Livestock Management
- Threatened and Endangered Species
- Wild and Scenic Rivers
- Wild Horses and Burros
- Wilderness Characteristics
- Wilderness and/or Wilderness Study Areas

[92] City of Los Angeles Department of Water and Power. 2007. *Urban Water Management Plan*. Los Angeles, CA. Available at: www.ladwp.com/water/supply/uwmplan/index.htm.

CHAPTER 2.0
PROPOSED PROJECT / PROPOSED ACTION AND ALTERNATIVES

2.1 PROPOSED PROJECT / PROPOSED ACTION

2.1.1 INTRODUCTION

This chapter of the EIR/EA provides descriptions of the proposed project / proposed action; five proposed project / proposed action alternatives proposed by the District to implement dust control measures (DCMs), through placement of straw bales and establishment of native vegetation, in order to attain the NAAQS and California State 24-hour standard for PM_{10}; and a No Project / No Action alternative. The difference between the proposed project / proposed action and the five proposed project / proposed action alternatives include differences in the amount of area controlled as well as the source of water and method of irrigation for the native vegetation. The proposed project / proposed action involves DCMs applied to 194 acres using irrigation water transported by water trucks from the Fault Test (FT) well to staging areas and transferred to all-terrain vehicle (ATV) trailer tanks. Alternatives 1 and 2 are the same as the proposed project / proposed action with an increase in DCMs applied to 214 and 197 acres, respectively.

Alternatives 3, 4, and 5 integrate refinements to the proposed project / proposed action that resulted from lessons learned from the pilot study that was undertaken by the District to assess the feasibility of the proposed project / proposed action and to address concerns that were raised by representatives of the Native American tribes during the consultation that was undertaken pursuant to Section 106 of the National Historic Preservation Act. Alternative 3 involves DCMs applied to 194 acres using a combination of irrigation water delivers by temporary aboveground polyvinyl chloride (PVC) pipelines and manual watering in selected areas. Alternative 3 also involves the placement of on-site 20,000-gallon water tanks within the staging areas along the Old State Highway. Alternative 4 involves dust control measures applied to 194 acres using water transported by water trucks to roadside staging areas off of State Route 136 for direct connection to a combination of irrigation water delivered by temporary aboveground PVC pipelines and manual watering in selected areas. Alternative 5 involves DCMs applied to 194 acres using water supplied via the existing Keeler Community Services District (KCSD) well/pipeline and delivered using a combination of irrigation water delivered by temporary aboveground PVC pipelines and manual watering in selected areas.

Each of the action alternatives provides for implementation of the DCMs by spring of 2015, to demonstrate attainment by spring 2018. The proposed project / proposed action and each of the action alternatives require a ROW from the BLM Bishop Field Office and a lease agreement with the LADWP. This document provides information to the authorized BLM officer to make a decision on whether to grant a ROW and, if so, to grant it as requested or modified. In accordance with CEQA Title 14 CCR Chapter 3 Section 15126.6(e) and NEPA 40 CFR 1502.14, this section also describes a no project / no action alternative, as well as alternatives considered but eliminated from detailed analysis.

Alternatives considered in the EIR/EA are based on issues identified by the BLM, as well as comments received during workshops hosted by the District during the development of the dust control strategy and comments received during the public scoping process. The BLM is required to consider, in detail, a range of alternatives that are considered "reasonable," usually defined as alternatives that are realistic (not speculative), that are technologically and economically feasible, and that respond to the purpose and need for the proposed action. The requirement is also identified as part of the CEQA Guidelines in Section 15126.6.

The District conducted an extensive literature review, field investigations, and both an air quality modeling and an empirical modeling of the straw bale array to support the development of the proposed action. Established empirical relationships were used in the model of the straw bale array to provide information to guide development of the control strategy. The results of this model analysis were used to design a 1.2-acre pilot demonstration project of the dust control strategy to test effectiveness in the field.[1]

Vegetation has been shown to reduce sediment dispersed by wind in three primary ways: (1) sheltering of the ground surface by direct coverage; (2) extracting momentum from the wind, thereby reducing wind shear stress at the ground surface; and (3) trapping particulates that are transported by the wind.[2] Utilizing different spacing of roughness features in the model analysis, including straw bales and differently sized shrubs, the density of roughness elements required to achieve the required level of dust control was determined. The District is currently conducting a pilot study using straw bales and native vegetation to stabilize and reduce dust emissions from an active portion of the Keeler Dunes, as well as to provide site-specific information that will be utilized for the final design of the dust control project. Although the pilot study is ongoing, results from the first several months of data collection are provided in Section 2.1.5.2, *Project Elements*, and demonstrate the effectiveness of the proposed action in attaining the required reductions in PM_{10} emissions in order to attain the federal and state PM_{10} standards. Information referring to land disturbance, equipment, schedule, mileage, and workforce are based on the most up-to-date engineering developed by the District and the initial results of the pilot study.

The No Project / No Action scenario describes the anticipated future environmental conditions in the absence of approval of the proposed project / proposed action or one of the five proposed project / proposed action alternatives being evaluated to assess the feasibility of minimizing or avoiding potentially adverse alterations to the physical environment.

If the final project design differs substantially from what is analyzed by the EIR/EA, the need for supplemental or additional environmental analysis will be determined by the District and BLM.

2.1.2 PROJECT BACKGROUND AND DEVELOPMENT

The requirement to control dust emissions from the Keeler Dunes in order to demonstrate attainment of the federal standard within the OVPA is specified in the 2008 SIP.[3] The District is responsible for developing a dust control strategy and plan for the Keeler Dunes PM_{10} emissions.

2.1.2.1 OVERVIEW AND SUMMARY OF DUST CONTROL IMPLEMENTATION IN THE KEELER DUNES

One of the largest remaining sources of uncontrolled PM_{10} emissions in the Owens Valley is the Keeler Dunes. The Keeler Dunes were specifically identified in the 2006 Settlement Agreement and the 2008 SIP as a source of PM_{10} that require controls in order for the OVPA to meet the

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[1] Gillies, J. A. July 2012. *Using Plants to Control Sand Movement and Dust Emissions: Keeler Dunes Pilot Project*. Prepared for: Great Basin Unified Air Pollution Control District. Prepared by: Desert Research Institute, Reno, NV.

[2] Wolfe, S.A, and W.G. Nickling. 1993. "The Protective Role of Sparse Vegetation in Wind Erosion." *Prog Phys Geogr*, *17*:50–68.

[3] Great Basin Unified Air Pollution Control District. 28 January 2008. *2008 Owens Valley PM10 Planning Area Demonstration of Attainment State Implementation Plan*. Bishop, CA.

federal PM_{10} standard and to meet the California State PM_{10} standard in Keeler and Swansea. Dust from the dunes cause an average of six violations of the National Ambient Air Quality Standards for PM_{10} every year in the community of Keeler. [4] These violations affect the residents of the communities of Keeler and Swansea, as well as local workers and visitors that travel through the area, and are a documented cause of safety problems on SR 136. As a result, the District began a focused investigation of the Keeler Dunes in 2008 to develop and implement a control strategy for dust emissions from the dunes.[5,6]

The process of investigating the source and responsibility for emissions and possible best available control measures, which was undertaken between 2011 and 2013, generated substantial controversy among the stakeholders. However, in 2013, the District and the LADWP executed the 2013 Settlement Agreement that allows the District to move ahead expeditiously with implementation of the dust control project in the Keeler Dunes with the support of LADWP. [7] According to the terms of the 2013 Settlement Agreement, the LADWP will provide ten million dollars ($10,000,000) to the District as a public benefit contribution for implementing dust controls in the Keeler Dunes (paragraph II.a.i). In return, the District agreed to forever release the LADWP from any and all liability for dust emissions, regardless of origin, from the Keeler Dunes (paragraph II.b.i). The funds from the LADWP for the "Keeler Project" were received by the District in December 2013.

2.1.3 ALTERNATIVES DEVELOPMENT AND SCREENING

This section outlines the process used by the District, with input from BLM, to develop alternatives for dust controls in the Keeler Dunes. Alternatives considered by the District and the BLM were developed in accordance with CEQA and NEPA and were evaluated by three criteria:

- Does the alternative feasibly obtain most of the purposes, needs, and objectives?
- Could the alternative avoid or substantially lessen any of the significant effects of the proposed project /proposed action on human/environmental resources?
- Is the alternative feasible to construct, operate, maintain, and decommission?

Alternatives that met the criteria above were carried forward for analysis. Those that did not meet the criteria were eliminated from further analysis and are described in Section 2.6, along with the reasons for elimination.

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[4] Great Basin Unified Air Pollution Control District. 16 November 2012. "Final Staff Report on the Origin and Development of the Keeler Dunes". Available at: http://gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Final%20Staff%20Report_Final20121116%20complete.pdf

[5] Kiddoo, Phill, Great Basin Unified Air Pollution Control District, Bishop, CA. November 2013. Email to Adam Furman, Sapphos Environmental, Inc., Pasadena, CA.

[6] California Department of Transportation. 6 March 2013. Public comments from the District Governing Board Meeting, Bridgeport, CA.

[7] Great Basin Unified Air Pollution Control District and Los Angeles Department of Water and Power. 25 June 2013. Phase 7a and Keeler Dunes Settlement Terms. Available at: http://www.gbuapcd.org/owenslake/Phase7a/LADWP-GBUAPCD-Phase7a&KeelerDunesSettlementTermsProposedFinal20130625.pdf

2.1.4 OVERVIEW OF ALTERNATIVES CONSIDERED IN DETAIL

The proposed project / proposed action and five project action alternatives are described in Section 2.2, and the no project / no action alternative is described in Section 2.3:

- Proposed Project / Proposed Action, Dust Control Measures Applied to 194 Acres Using Irrigation Water Delivered via Water Trucks / ATVs
- Alternative 1, Dust Control Measures Applied to 214 Acres Using Irrigation Water Delivered via Water Trucks / ATVs
- Alternative 2, Dust Control Measures Applied to 197 Acres Using Irrigation Water Delivered via Water Trucks / ATVs
- Alternative 3, Dust Control Measures Applied to 194 Acres Using Irrigation Water Delivered via Water Trucks / Tanks / PVC Irrigation System and Selected Manual Watering
- Alternative 4, Dust Control Measures Applied to 194 Acres Using Irrigation Water Delivered via Water Trucks / PVC Irrigation System and Selected Manual Watering
- Alternative 5, Dust Control Measures Applied to 194 Acres Using Irrigation Water Delivered via KCSD Water Well / Pipeline to Irrigation System and Selected Manual Watering
- Alternative 6, No Project / No Action

2.1.5 FEATURES COMMON TO THE PROPOSED PROJECT / PROPOSED ACTION AND ALL PROPOSED PROJECT / PROPOSED ACTION ALTERNATIVES

The features common to the proposed project / proposed action and all proposed project / proposed action alternatives are detailed in this section. Project elements and construction methods listed in this section will be evaluated in the environmental assessment in Section 4.0, *Environmental Consequences*.

The proposed project / proposed action and the proposed project / proposed action alternatives have a common description of site location; project components, including temporary access routes, staging areas, and water supply; effectiveness monitoring program; and project maintenance. The primary differences between the proposed project / proposed action and the proposed project / proposed action alternatives are the areal extent to which the dust controls are applied, and whether ATVs or a combination of ATVs and a temporary irrigation system would be used to deliver water to support plant establishment, during the initial 3 years of the vegetation efforts. The proposed project/proposed action and three of the action alternatives involve the use of temporary water tanks at three of the four staging areas during the initial three years of the revegetation efforts. These differences will be separately identified with corresponding figures and tables in Section 2.2. The proportion of the project area with differing designed percent reduction of PM_{10} emissions (or control efficiency/level) as well as the footprint of the control area varies slightly from one alternative to another. The changes in the extent of different control levels within the alternatives correspond to differences in the number of straw bales and plants required in the different proposed project / proposed action alternatives.

2.1.5.1 SITE LOCATION AND ENVIRONMENTAL SETTING

The proposed project / proposed action and action alternatives consist of vegetation establishment primarily on lands managed by the BLM. The southern boundary of the study area is located 1,650 feet north-northwest of the community of Keeler, California, and east of the Owens Lake bed, in the unincorporated territory of Inyo County, California (Figure 1.3.1-1). The boundary of the project study area meets the regulatory shoreline of Owens Lake in the southwest and is located up to 7,420 feet away from the shoreline at its most distant point. The project study area is shown, including land ownership parcels, on a satellite image base (Figure 2.1.5.1-1, *Study Area Location and Parcel Ownership Map*). The DCMs for the proposed project / proposed action and alternatives would occur within the study area limits. Access to the proposed project / proposed action area would be via the gravel haul road (constructed for the Owens Lake dust control activities) from SR 136 between Keeler and Swansea.

A. Regional Environmental Setting

The proposed project / proposed action is located in the southern end of the Owens Valley, which is approximately 121 miles long and 16 miles wide, and is located in Inyo County. The Owens Valley is defined by the Sierra Nevada Mountains to the west and the White Mountains and Inyo Mountains on the east. The watershed defined by these mountain ranges drains toward Owens Lake. The Owens River is a north-south trending perennial river in the Owens Valley that terminates at the north end of Owens Lake. The Los Angeles Aqueduct transports surface water and groundwater from the valley to the City of Los Angeles. The diversion and export of surface water resources from the Owens Valley caused the lowering of the water level of Owens Lake. Before dust control implementation on the lake bed, exposed dry lake sediments were dispersed into the air by prevailing winds during high wind events, resulting in severe dust storms. Dust emissions from the lake bed sources were and still are the primary source causing and contributing to exceedances of the federal and state PM_{10} standards within the OVPA. However, another significant source of PM_{10} that directly affects the Keeler-Swansea area is the active and mobile portions of the Keeler Dunes.

The climate of the Owens Valley is semiarid to arid and is characterized by low precipitation, abundant sunshine, frequent winds, moderate to low humidity, and high potential evapotranspiration. The Sierra Nevada Mountains, trending north to south, west of the proposed project / proposed action area, greatly influence the climate (Figure 1.3.1-1, *Regional Vicinity Map*). A rain shadow is present east of the crest of the range such that the Owens Valley floor, the Inyo and White Mountains, and the Coso Range receive appreciably less precipitation, ranging from 7 to 14 inches (in) / year in the Inyo and White Mountains to approximately 5 in/year on the valley floor. [8] Air temperatures within the Owens Valley can range greatly from –2 degrees Fahrenheit (° F) in the winter to nearly 110° F in the summer and can also range widely during a single day spanning more than 50° F.[9]

The Owens Valley has attracted the interest of archaeologists since at least the 1930s. The Riddells first conducted major work in the region in the 1940s and 1950s, recording several sites on the

[8] Hollett, K., Danskin, W., McCaffrey, W., and Walti, G. 1991. *Geology and Water Resources of Owens Valley, California*. U.S. Geological Survey Water Supply Paper 2370-B. Denver, CO: U.S. Geological Survey.

[9] Danskin, W.R. 1998. "Evaluation of the Hydrologic System and Selected Water-Management Alternatives in the Owens Valley, California." U.S. Geological Survey Water-Supply Paper 2370. Prepared in cooperation with Inyo County and the Los Angeles Department of Water and Power. Denver, CO: U.S. Geological Survey.

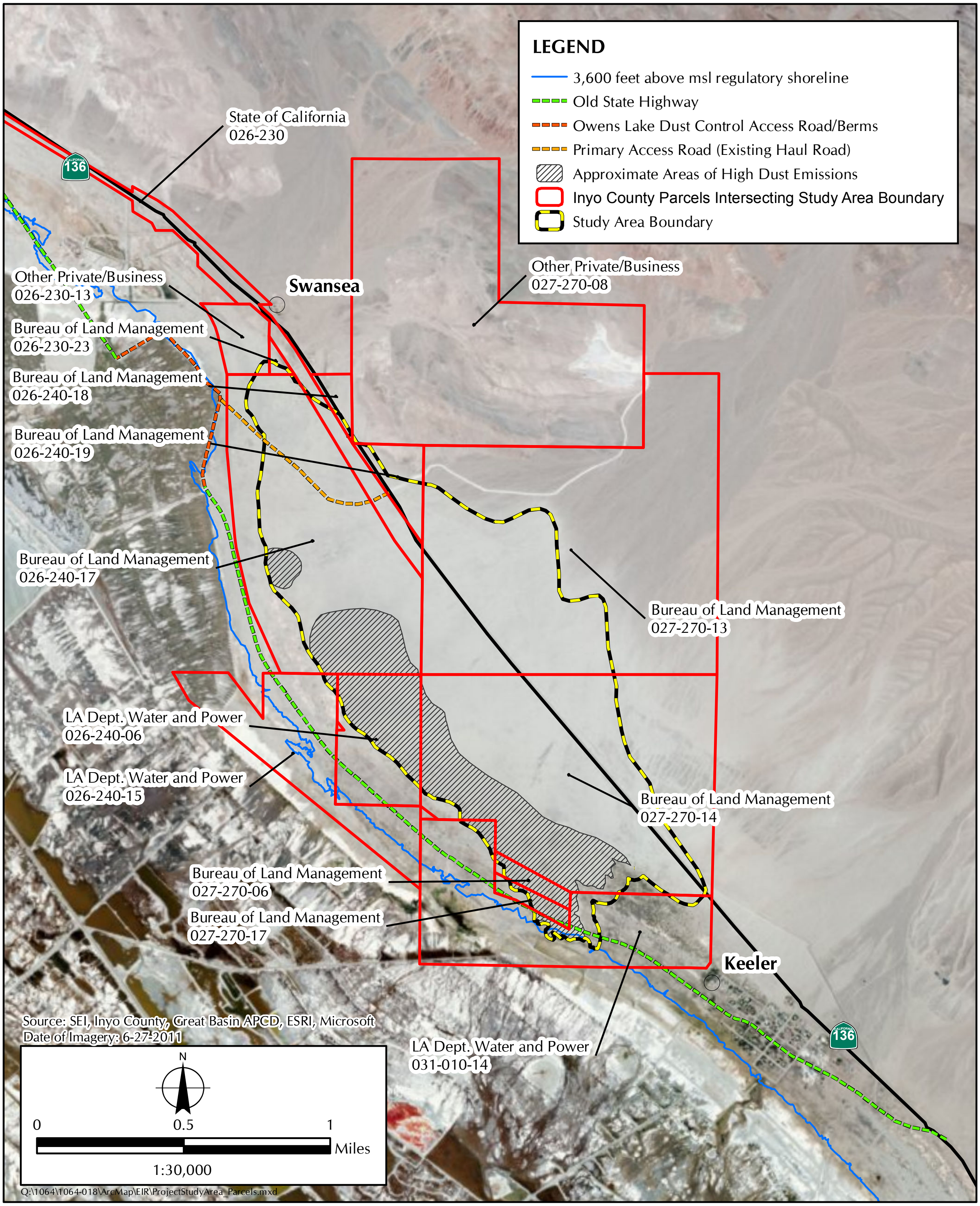

FIGURE 2.1.5.1-1

Study Area Location and Parcel Map

perimeter of Owens Lake, including important sites at Cottonwood Creek and Rose Spring.[10, 11] Two California State Historic Landmarks and two California Points of Historic Interest are located in the vicinity of Owens Lake. Ethnographic data indicate that the east shore of Owens Lake was used by Native American groups.[12] Historic resources related to mining and transportation have also been identified along the stranded historic shoreline along the eastern shore of Owens Lake and in the vicinity of the Keeler Dunes.[13]

Current land uses in the Owens Valley are predominantly recreation, ranching, and agriculture. There are approximately 12,000 irrigated acres including approximately 2,900 acres of alfalfa. The City of Los Angeles owns most of the land on the Owens Valley floor with the exception of the bed of Owens Lake, which is primarily state land managed by the California State Lands Commission, and land within the five towns in the valley. The BLM manages federal land on the valley floor and on the slopes of the White, Inyo, and Sierra Nevada mountain ranges. The five towns in the Owens Valley are Bishop, Big Pine, Independence, Lone Pine, and Olancha/Cartago. The Owens Valley transportation system is largely made up of U.S. Highway 395, which runs north-south through the valley, and SR 190 and SR 136, which serve the Owens Lake area (Figure 1.3.1-1).

The communities of Swansea to the north and the community of Keeler to the southeast are in the vicinity of the proposed project / proposed action located in the unincorporated area of Inyo County; Figure 2.1.5.1-1). Existing activities in the vicinity of the study area include agricultural cattle grazing; mining; recreation, such as bird-watching, fishing, and camping; dust control operations; and air quality monitoring. The LADWP and the District both have Owens Lake operation/monitoring facilities in Keeler on Sulfate Road and Cerro Gordo Road, respectively.

B. Local Environmental Setting

The proposed project / proposed action study area is situated on the western portion of the Keeler alluvial fan that slopes from the Inyo Mountains on the east to the bed of Owens Lake on the west. The topographic relief of the study area is 285 feet and extends from 3,600 feet above mean sea level (MSL) at the historic shore of Owens Lake to approximately 3,885 feet above MSL on the alluvial fan. The location of the proposed project / proposed action is depicted on U.S. Geological Survey (USGS) 7.5-minute series topographic quadrangles Owens Lake[14] and Dolomite[15] (Figure 2.1.5.1-2, *Topographic Map with USGS 7.5-minute Quadrangle Index*).

The majority of the proposed project / proposed action study area is composed of open, sparsely vegetated areas containing active sand dunes and sand sheets. Vegetated areas within the study area are characteristic of the Shadscale Scrub plant community, which is dominated by Parry's

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[10] Riddell, 1951. Riddell, H.S., *The Archaeology of a Paiute Village Site in Owens Valley*, Reports of the University of California Archaeological Survey No. 12, Berkeley, California, 1951.

[11] Riddell and Riddell, 1956. Riddell, H.S., and F.A. Riddell, *The Current Status of Archaeological Investigations in Owens Valley, California*, Reports of the University of California Archaeological Survey, No. 33, Paper 38, Berkeley, California, 1956.

[12] Liljeblad, S., and Fowler, C.S. 1986. "Owens Valley Paiute." In *Handbook of North American Indians*, Volume 11, Great Basin, pp. 412–434. Washington, DC: Smithsonian Institution.

[13] Jones & Stokes. 1997. Cultural Resources Inventory and Evaluation of Historic Resources on the Eastern Side of Owens Lake for the Great Basin Unified Air Pollution Control District. Report prepared for Great Basin Unified Air Pollution Control District, Bishop.

[14] U.S. Geological Survey. 1987. *7.5-Minute Series, Owens Lake, California, Topographic Quadrangle*. Denver, CO.

[15] U.S. Geological Survey. 1987. *7.5-Minute Series, Dolomite, California, Topographic Quadrangle*. Denver, CO.

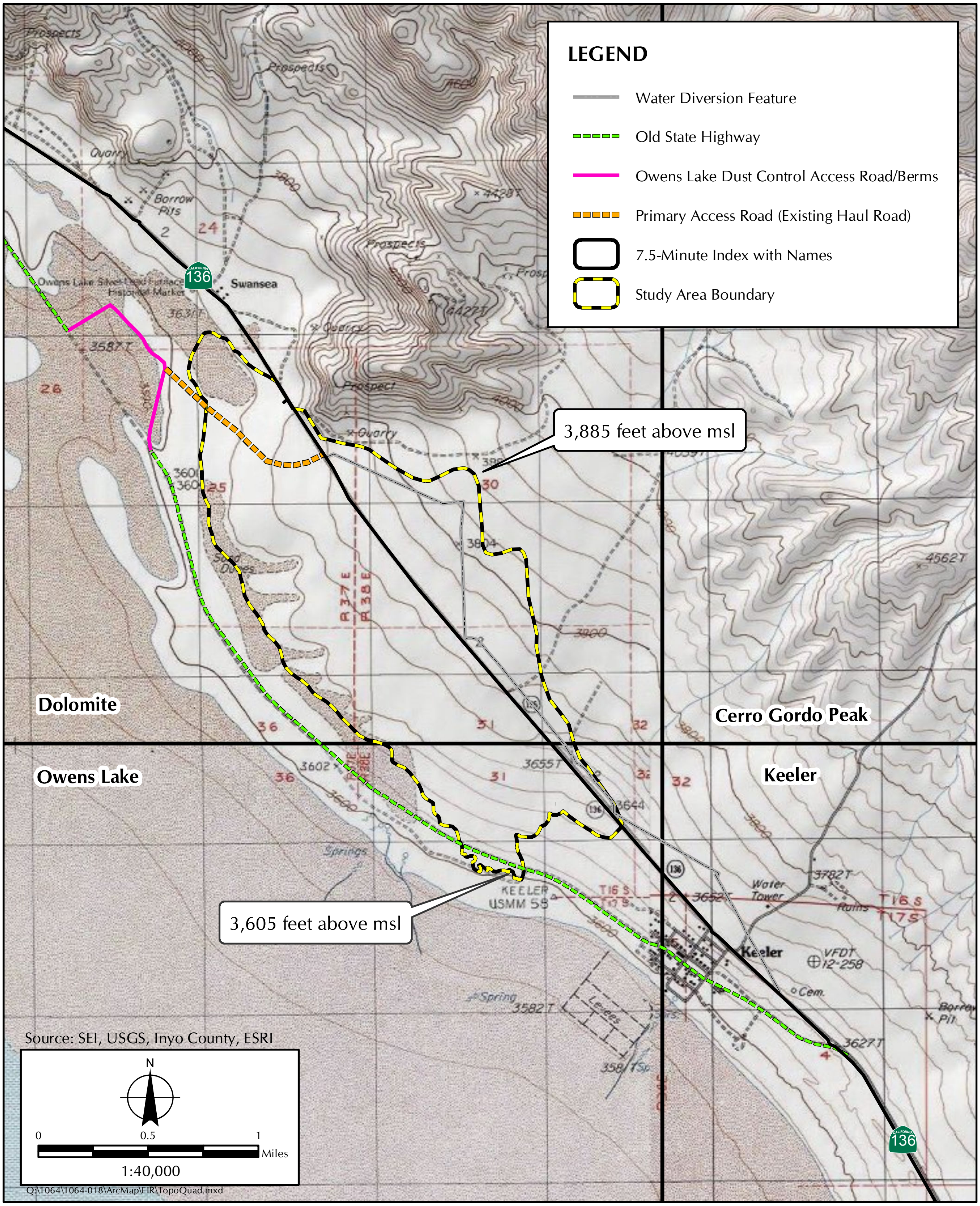

FIGURE 2.1.5.1-2

Topographic Map with USGS
7.5-Minute Quadrangle Index

saltbush (*Atriplex parryi*) and greasewood (*Sarcobatus vermiculatus*).[16, 17] The mobile dune and sand sheet deposits within the study area are a dynamic geomorphological feature that shift or move based on winds within the region. As a result, due to the prevailing wind in the area, they are migrating to the south east an average of 66 feet per year (Figure 2.1.5.1-3, *Geomorphic Map of the Keeler Dunes Area*).

Accordingly, as the active dunes and sand deposits shift over time, the footprint of proposed project / project action area may migrate to the southeast. To account for the shifting location of dust emissions and, therefore, of the proposed project / proposed action area, the proposed project / proposed action boundary for this EIR/EA includes approximately 14 acres to the southeast where dunes do not currently exist, but where they are anticipated to exist in 2015.

C. Existing Dust Control Areas at Owens Lake

The proposed project / proposed action and alternatives are located adjacent to the bed of Owens Lake where DCMs have been implemented and are ongoing to control particulate emissions resulting from the desiccation of the Owens Lake. The District has established that the desiccation of Owens Lake and the exposure of the alkaline soils that are characteristic of the exposed dry lake bed resulted from City of Los Angeles water diversions from the Owens River and its tributaries into the Los Angeles Aqueduct. Approved BACMs for Owens Lake include shallow flooding; managed vegetation; gravel cover; and combinations of these methods, termed a hybrid. Shallow flooding composes approximately 87 percent of the existing 42 square miles of DCMs implemented on the lake bed, with managed vegetation and gravel cover composing the remainder as of December 2013.

2.1.5.2 PROJECT ELEMENTS

Common elements of the proposed project / proposed action and alternatives include placement of straw bales as temporary wind breaks and planting and establishing native vegetation along the base of the straw bales to eventually replace the bales as a permanent DCM.

A. Existing Uses and Features

The proposed project / proposed action study area is 870.6 acres of undeveloped rural land, primarily owned by the BLM (approximately 778.5 acres; 89 percent) and LADWP (66.7 acres; 8 percent). DCMs will be implemented on the most emissive deposits located west of SR 136 and east of the Old State Highway between the communities of Swansea to the north and Keeler to the southeast. An ROW permit from the BLM and a lease from the LADWP will be required for implementation of the proposed project / proposed action. The proposed project / proposed action site is natural habitat open space that is utilized by the residents of Keeler for recreational purposes.

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[16] Holland, Robert F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California*. Sacramento, CA.

[17] Sawyer, J.O., and T. Keeler-Wolf. 2009. *A Manual of California Vegetation*. 2nd Edition. Sacramento, CA: California Native Plant Society.

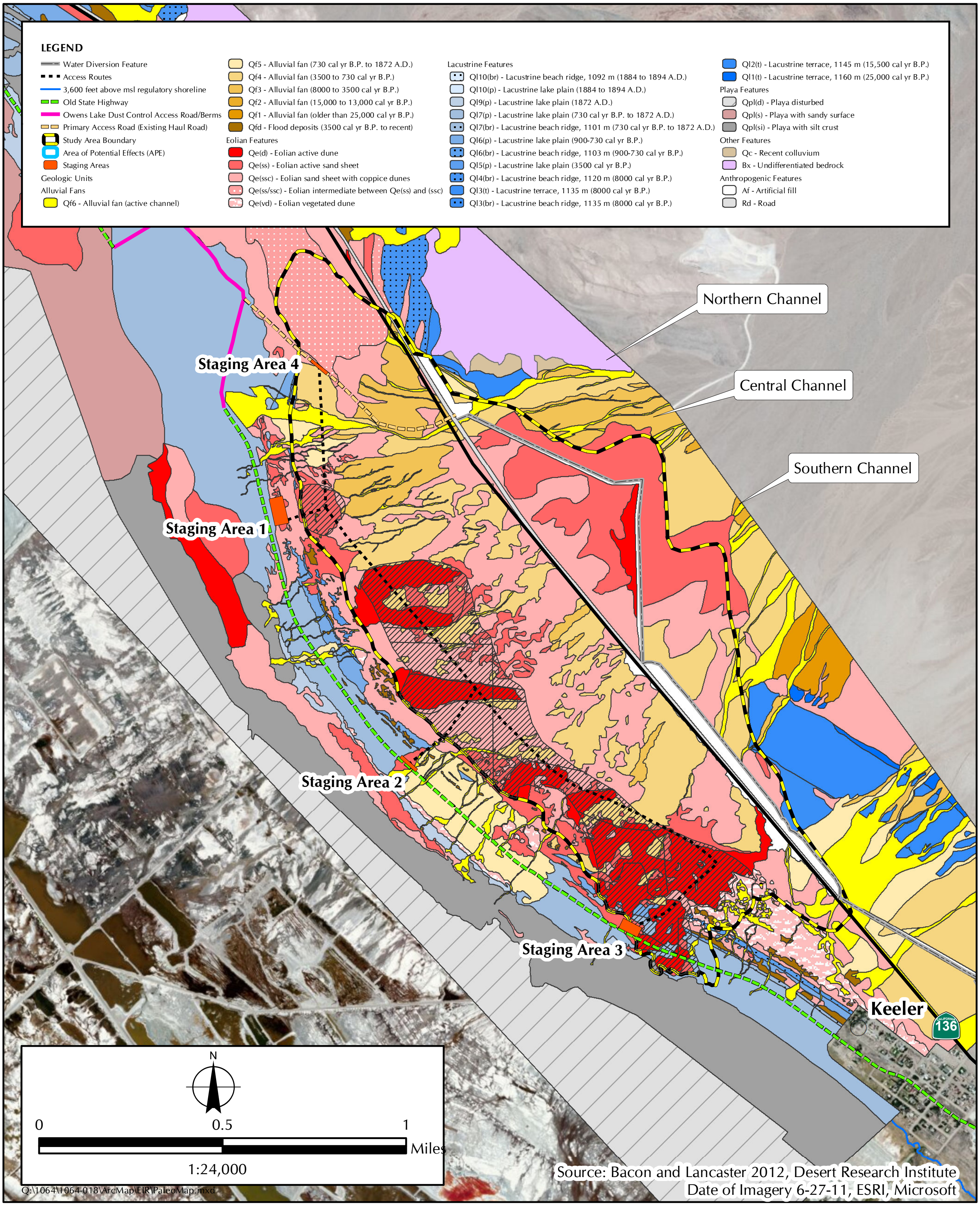

FIGURE 2.1.5.1-3

Geomorphic Map of the Keeler Dunes Area

B. General Plan and Zoning Designations

The proposed project / proposed action site is located on lands subject to the BLM Bishop RMP as part of the Owens Lake Management Area and on lands owned by the LADWP.[18] The Land Use Element of the Inyo County General Plan designates the project site as State and Federal Lands, Natural Resources, and Rural Protection.[19] The Inyo County Zoning Ordinance designates the proposed project / proposed action study area as predominantly OS-40, Open Space Zone, and a 40-acre minimum lot size.[20] The OS-40 designation encourages the preservation and protection of mountainous, hilly upland, valley, agricultural, potential agricultural, fragile desert areas, and other mandated lands from fire erosion, soil destruction, pollution, and other detrimental effects of intensive land use activities.[21]

C. Dust Control Measure Design

The goal of the proposed project / proposed action would be to temporarily stabilize the surface with straw bales and then create a permanently stabilized natural vegetated dune environment that mimics natural environments such as the existing Swansea Dunes (located to the northeast) and other stable shoreline dunes in the region (found both at Owens Lake and Mono Lake). The established native shrubs would act to prevent high emissions of dust by disrupting the wind and lowering the wind speed at the surface in order to reduce sand motion activity (Figure 2.1.5.2-1, *Example of Vegetated Swansea Dunes*). The District designed the proposed project / proposed action and proposed project / proposed action alternatives to minimize environmental impacts. The District is currently conducting a pilot study to test the effectiveness of this DCM within the Keeler Dunes. A description of each DCM component, specifically straw bales and native vegetation, is presented below, along with the preliminary results of the pilot study.

Straw Bales

This is an element of the DCM that would be used to stabilize emissive dust areas and provide a sheltered environment for plants during establishment. The bales will degrade over time as the plants are established. The proposed project / proposed action and proposed project / proposed action alternatives will utilize straw bales (24 x 16 x 48 inches or similar size) installed in an irregular pattern across the proposed project / proposed action area. All straw bales used at the dunes would be certified weed free to minimize the threat from invasive weeds. Straw bales are anticipated to degrade and would provide organic material to the existing soil. Limited maintenance of straw bales (replacement of broken bales) is anticipated. After the project maintenance period of approximately 3 years, when the plants are expected to be established, any non-organic material used to bind the bales would be removed from the proposed project / proposed action site and disposed of properly in a landfill or recycled to avoid the potential of litter in the proposed project / proposed action area.

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[18] U.S. Department of the Interior, Bureau of Land Management, Bakersfield District. 1993. *Bishop Resource Management Plan Record of Decision*. Bakersfield, CA.

[19] Inyo County Planning Department. December 2001. *Inyo County General Plan, Land Use Element*. Independence, CA.

[20] Inyo County. 30 June 2003. "Zoning Ordinance," Title 18, *Inyo County Code*. Independence, CA.

[21] Inyo County. 30 June 2003. "Zoning Ordinance," Title 18, *Inyo County Code*. Independence, CA.

FIGURE 2.1.5.2-1
Example of Vegetated Swansea Dunes

Recent research has found that surface roughness can influence the rate of sand transport (and associated dust emissions[22]) and that, using established relationships, the prediction of sand flux reduction using known geometric properties is possible.[23,24] The District designed a pilot test study for an active and emissive portion of the Keeler Dunes to evaluate a specific array of roughness elements (straw bales), designed based on published empirically defined relationships between sand flux reduction and roughness density (Appendix K, *Using Roughness [Solid Elements and Plants] to Control Sand Movement and Dust Emissions: Keeler Dunes Dust Demonstration Project, Interim Report,* and Appendix L, *Preliminary Results of Plant Establishment in the Straw Bale Demonstration Dust Control Project*). Using the modeled relationship between predicted sand flux and roughness elements, the number of straw bales required to meet the design criterion of 85 percent control efficiency was calculated.[25] From this, it was estimated that 502 bales were required within the 5,000 m^2 test area.

The pattern of the straw bale array in the test area was developed by copying a natural vegetation pattern adjacent to the Keeler Dunes. This pattern was then scaled until 502 points fell within the 50 x 100 m test area, representing the 502 straw bales. Each of the 502 points was assigned a geographic position within the test area, and bales were then placed at these positions in the field. The winds causing the highest magnitude dust emissions come from the northwest, thus the centerline of the array was oriented to 326 degrees azimuth to best capture the highest-magnitude sand transport events. The longest side of each bale was oriented perpendicular to the mean prevailing wind direction. Instrumentation to monitor sand motion and wind was installed within and adjacent to the test area.

In April 2013, prior to placement of the straw bales, the sand motion and wind monitoring instrumentation was installed to measure the baseline sand flux within the test area. Between April 30 and May 22, 2013, 18 wind events that resulted in measurable sand motion were recorded. Based on the measurements captured throughout the test area, it was determined that sand flux was relatively uniform across and along the test area prior to the placement of the straw bales.

Straw bales were placed on the site on two dates, May 23 and June 12, 2013. Between the time of the first bale placement and August 7, 2013, 74 separate sand transport events of varying duration and magnitude were recorded. The mean sand flux was observed to decrease from both the north and south border of the test area to its interior. Data from the middle of the straw bale array measured a sand flux reduction of 94 percent as compared to the outside of the array.[26] The predicted control level for the test was 85 percent; thus the initial measurement of 94 percent sand flux reduction in the array interior indicates the roughness may be performing better than expected. Similar rates of sand flux decrease were recorded from both north and south wind events.

[22] There is an established relationship between the rate of sand motion (or sand flux) and the amount of PM_{10} generation for the material in the dunes. Based on this relationship, it is possible to estimate the amount of PM_{10} reduction that will occur for a measured reduction in sand flux.

[23] Gillies et al. 2007 from the Gillies 2013 report

[24] Gillies and Lancaster 2013 from the Gillies 2013 report

[25] Gillies, J. 2013. Using Roughness (Solid Elements and Plants) to Control Sand Movement and Dust Emissions: Keeler Dunes Dust Demonstration Project, Interim Report. Prepared by the Desert Research Institute for the Great Basin Unified Air Pollution Control District.

[26] Gillies, J. 2013. Using Roughness (Solid Elements and Plants) to Control Sand Movement and Dust Emissions: Keeler Dunes Dust Demonstration Project, Interim Report. Prepared by the Desert Research Institute for the Great Basin Unified Air Pollution Control District.

The pilot test project will continue to collect data during the environmental review process to further refine the relationships and observations recorded during the pilot study and guide the final design of the project.

Native Vegetation

This component of the DCM involves establishing a mix of native vegetation in association with the straw bale placement, described above. In addition to acting as roughness, the straw bales will shelter young native plants. It is expected that as the straw bales degrade over time, the dust control function will be transferred to the native plants as they mature and grow. Native vegetation to be planted within the dust control areas includes *Atriplex polycarpa* (ATPO) (66 percent) and a mixture of other native plant species (33 percent). ATPO was selected for its physiological characteristics, such as seed availability, low water needs, relatively rapid growth, and adaptation to the regional area.[27] A list of native vegetation that will be considered for planting at the dunes in addition to the ATPO is shown in Table 2.1.5.2-1, *Native Vegetation List*. In addition to planting seedlings, scattering native seeds in selected areas may be considered as a supplemental means of increasing the distribution and diversity of the vegetation and additional control of the mobile sand within the project area. Species selection will be influenced by seed availability. Finally, it is anticipated that as the sand dunes become stabilized, seeds that are naturally transported by wind and wildlife will establish and provide additional diversity and cover. Seed produced by the introduced plants themselves as they mature will also ensure that the vegetation is self-sustaining.

TABLE 2.1.5.2-1
NATIVE VEGETATION LIST

Scientific Name	Common Name	Form
Atriplex polycarpa (ATPO)	Cattle spinach, cattle saltbush	Shrub
Atriplex confertifolia (ATCO)	Shadscale saltbush	Shrub
Atriplex parryi (ATPA)	Parry's saltbush	Shrub
Atriplex phyllostegia (ATPH)	Arrowscale	Annual herb
Cleomella obtusifolia (CLOB)	Mojave stinkweed, Mojave cleomella	Annual herb
Cleome sparsifolia (CLSP)	Fewleaf cleome, fewleaf spiderflower	Annual herb
Psathyrotes ramoissima (PSRA)	Turtleback	Annual or perennial herb
Sarcobatus vermiculatus (SAVE)	Greasewood	Shrub
Suaeda moquinii (SUMO)	Inkweed, Mojave seablite	Perennial herb/subshrub

Native plants will be cultivated, from seed collected from local sources in the Owens Valley, in nurseries and will be approximately 6 inches in height prior to planting in the project area. The District shall work with representatives of the local Native American tribes, to include their participation, to the maximum extent practicable, in the installation of the plants, particularly in sensitive areas.

Ground preparation for planting will involve initial placement of a straw bale, followed by application of approximately 5 gallons of water under and along the edge of each straw bale. Work crews will then install up to 3 native plants and one watering tube along the base of each straw

[27] HydroBio Advanced Remote Sensing. October 2011. "Stabilizing Keeler Dunes Rapidly Using Native Vegetation and Minimal Inputs." Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA.

bale by digging a shallow trench approximately 12 inches deep and sufficient in size to place the plants and a temporary watering tube. Excavated soil will then be placed back in the hole around the plants and the watering tube and tamped to ensure good firm soil contact with the soil from the plants. The watering tubes will consist of slotted or perforated 2- to 6-inch pipe with caps at both ends. The watering tube will be 14 to 16 inches in total length and will be installed so that they extend 12 inches into the soil adjacent to the planted shrubs (Figure 2.1.5.2-2, S*chematic Figure Showing the Installation of Bales, Plants, Watering Tube, and Plant Protective Cage*). During irrigation events, the cap at the top of the watering tube will be removed so that water can be applied into the watering tube in order to direct it directly to the root zone of the plants. At the end of the water application at each bale, the top cap will be replaced on the water access tube. Additionally, bales sites that are planted with SUMO and SAVE will have a wire protective cage installed in order to reduce the impact to these species from small mammal browsing. The wire cages will extend approximately 12-16 inches in height and be constructed out of wire mesh supported by dowels and attached to the side of the straw bale. The protective cages will be open on the top. Watering tubes and plant protective cages will be removed at the end of the three year plant establishment phase of the project.

In addition, seeds of native plants may be dispersed in open areas between the straw bales. Initially, the dust control reduction will be achieved through the array of straw bales. Over time, as the bales stabilize the surface and allow the plants to become established, dust control will be taken over by the plants and the straw bales will naturally decompose. Although the project is designed to achieve the required control levels immediately with the placement of the straw bales, it is expected that the level of dust control achieved by the plants will improve over time as the plants increase in size and ultimately become larger than the original straw bales. The long-term goal of this DCM would be the establishment of a self-sustaining native vegetation community to control dust with minimal or no long-term maintenance.

The design of the proposed project / proposed action and alternatives requires that the contractor provide a comprehensive, adaptive Weed Control Plan for review and approval by the BLM. The purpose of the plan will be to minimize the establishment and spread of nonnative and invasive weed species within the project area. Minimum requirements for the Weed Control Plan are included in the project design (Section 2.1.5.3).

In addition to testing the effectiveness of straw bale placement, the District included testing of plant establishment of native shrubs on the pilot test project[28] Five species of shrubs native to the Owens Lake area were chosen for propagation and planting (Table 2.1.5.2-1; ATPO, ATPA, ATCO, SAVE, and SUMO). One hundred and forty-one plants were planted in the test site on May 30, 2013. The shrubs were planted in a block of 47 straw bales in the southeastern portion of the straw bale test area. Planting sites were prepped the preceding day by watering the area underneath and around each selected bale with 5.4 gallons of water. Three shrubs were subsequently planted along the northern side of each bale. Two watering tubes were installed to a depth of 12 inches between the shrubs to facilitate water delivery directly to the root zone area. Following planting, each selected bale location was watered with approximately 5.4 gallons of water. Supplemental water was provided to the plants throughout the summer. Due to the harsh conditions during June and July 2013, the shrubs planted at the end of May 2013 were given supplemental water to assist in establishment. During the first month following planting, supplemental water was provided seven times with an average of 4 days between watering events. The watering frequency was reduced to

[28] Holder, G.A.M. 2013. Preliminary Results of Plant Establishment in the Straw Bale Demonstration Dust Control Project. Prepared by Great Basin Unified Air Pollution Control District. Prepared for Sapphos Environmental, Inc.

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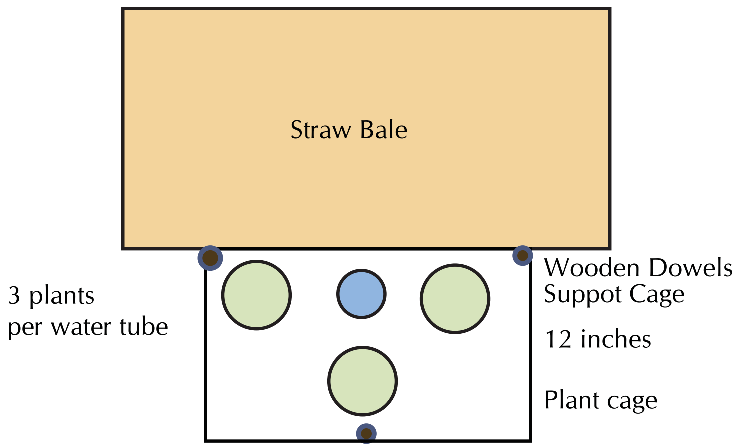
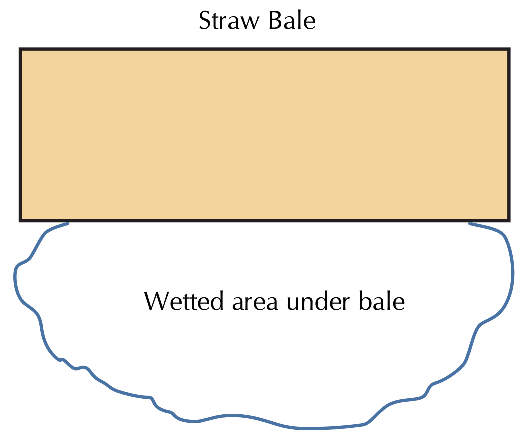
PLAN VIEW

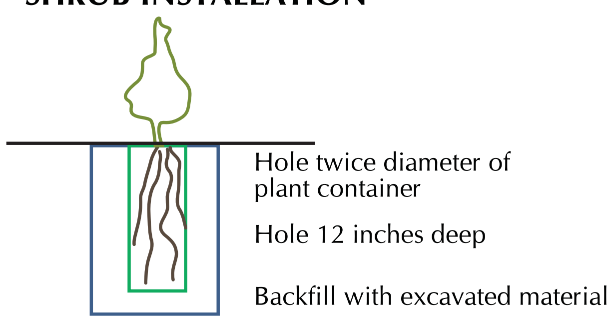


Plan view of straw bale and plant array,
including water access tube and cage

SIDE VIEW



SHRUB INSTALLATION



WATER ACCESS TUBE

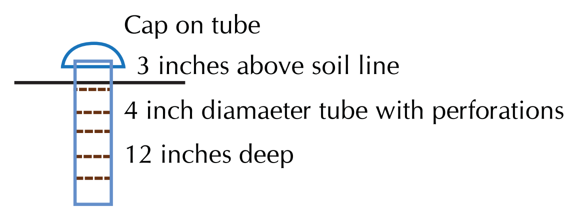


FIGURE 2.1.5.2-2
Schematic Figure Showing the Installation of
Bales, Plants, Watering Tube, and Plant Protective Cage

an average of every 7-8 days during July through mid-September. In mid-September, the irrigation schedule was further reduced to approximately every 2 weeks. Then in October the frequency was reduced to every 3 weeks and then 4 weeks. The last irrigation event was in October 2013. An average of 3.0 gallons of water was applied to the location of each planted bale during each watering event. Plant health (or vigor) and survivorship was monitored regularly following planting. The District also planted a set of plants in October 2013 to better represent the schedule for planting on the proposed project / proposed action. As of March 2014, these plants were only watered at the time of initial planting and have a survivorship rate of over 92 to 98 percent. Supplemental watering will be conducted for these plants in April 2014 following the schedule provided here for the proposed project / proposed action.

Overall plant survivorship as of September 13, 2013, was 72 percent.[29] Plant survivorship for individual species varied greatly. ATPO had the highest survivorship, at 94.4 percent, followed by ATCO (91.3 percent), SAVE (83.3 percent), ATPA (41.2 percent), and SUMO (16.7 percent). ATPA plant deaths accounted for two-thirds of all plant deaths. The reason for the high death rate for ATPA is unclear but appears to be related to plant form and structure. However, in a second set of plants that were planted on the test site in October 2013, the ATPA survivorship appears to be much higher. The likely cause of the high proportion of SUMO deaths is thought to be small mammal browsing impacts. Similar browsing impacts were observed for the SAVE plants. As a result of this, wire protective cages were placed around all plants at bales containing SUMO and SAVE in mid-September 2013. Installation of protective structures for the plants is included in the proposed project / proposed action and alternatives. These structures are required to be removed within 3 years of installation or when the plants begin to outgrow the structure. Vigor of all surviving plants on the test site remained high through the first 2.5 months of the pilot study, with 66 percent of living plants achieving a Good or Excellent vigor rating by September 2013, and only 34 percent in the Fair or Poor categories.[30]

A plant survivorship rate of 50 percent is generally considered successful on most desert restoration projects.[31] By this measure, the pilot test project has achieved and surpassed this rate with a 72 percent survival rate after 2.5 months. The plants in this test study were planted in late spring rather than fall as originally planned and as planned for the proposed project / proposed action. Fall is the optimum planning time for desert vegetation; thus, future studies on survivorship could provide slightly different results. A second planting of 354 native shrubs occurred on October 24, 2013, which will provide further plant survivorship data useful in final project design.

Lessons learned from the test pilot study were the importance of protection of plants from browsing impacts, the importance of strong stem/root structure before planting and the importance of providing supplemental water to the plants following initial planting. As a result of this, the District provided protective enclosures at bales that were planted with SUMO and SAVE plants during the October 2013 planting, and new ATPA plants were pruned to promote an upright stem structure and growth. Additionally, the District has provided for supplemental irrigation events in the proposed project / proposed action in order to provide water in the spring and fall seasons. The

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[29] Holder, G.A.M. 2013. Preliminary Results of Plant Establishment in the Straw Bale Demonstration Dust Control Project. Prepared by Great Basin Unified Air Pollution Control District. Prepared for Sapphos Environmental, Inc.

[30] Holder, G.A.M. 2013. Preliminary Results of Plant Establishment in the Straw Bale Demonstration Dust Control Project. Prepared by Great Basin Unified Air Pollution Control District. Prepared for Sapphos Environmental, Inc.

[31] Abella, S.R. and A.C. Newton. 2009. A systematic review of species performance and treatment effectiveness for revegetation in the Mojave Desert, USA. In Arid Environments and Wind Erosion, eds. A. Fernandez-Bernal and M.A. De La Rosa. Hauppauge, NY: Nova Science Publishers, 45-74.

District will continue to collect data during the environmental review process to further refine the observations and results recorded during the pilot study and to guide the final project design.

D. Other Project Elements and Design Considerations and Features Common to the Proposed Project / Proposed Action and All Proposed Project / Proposed Action Alternatives

Other project elements consist of infrastructure components, including a temporary access route; temporary staging areas for equipment, straw bales, and plants; water storage tanks for alternative 3 only; and an effectiveness monitoring program (existing air monitoring stations). These common project elements are identified on Figure 2.1.5.2-3, *Location of Project Infrastructure Elements Common to All Action Alternatives*. Site preparation for portions of the staging areas and temporary access route would require minimal brushing and grubbing, although impacts will be minimized to the extent practicable. Construction of each proposed project / proposed action alternative would result in a total temporary disturbance of 33.1 acres for the proposed project / proposed action, Alternative 1, Alternative 2, and Alternative 3; 36.1 acres for Alternative 4; and 33.8 acres for Alternative 5. The estimated time period for construction is less than 11 months, with planting occurring in the fall and early winter (October through December). Supplemental watering, if necessary, would be conducted in late winter / early spring and late summer / early fall and would require approximately 1 to 3 months to complete for each watering event.

Staging Areas

Four temporary staging areas will be established to provide contractor(s) with storage and placement of equipment, straw bales, native plants, supplies, and in Alternative 3 only, temporary water storage tanks. The staging area(s) will be located on land near the proposed project / proposed action area (Figure 2.1.5.2-3). The total area of the proposed staging areas is approximately 3.2 acres, all of which are considered temporary impacts. A portion of each staging area will have standard fencing installed to secure materials and equipment as necessary.

One main staging area (Staging Area 1) will be established within the northwestern edge of the proposed project / proposed action area on land administered by the BLM (Figure 2.1.5.2-3). Located immediately east of Old State Highway, the staging facility will measure 50 feet by 300 feet in area and will be used by the contractor(s) for the storage of equipment, fuel, all-terrain vehicles (ATVs), native plants, and other supplies.

Staging Area 2 will also be constructed for the proposed project / proposed action along the Old State Highway, on land managed by the LADWP (Figure 2.1.5.2-3). Staging area 2 will measure 200 feet by 400 feet and construction crew may park at this location.

Staging Area 3 is located on land managed by the BLM and will measure 150 feet by 300 feet, and has been designed to accommodate the ability for trucks to turn around. Both Staging Area 2 and 3 will be used for the temporary storage of equipment and materials needed for DCMs in the central and southern portions of the proposed project / proposed action area.

Staging Area 4 will be established adjacent to the gravel haul road constructed by the LADWP for dust mitigation on the Owens Lake, adjacent to the turn-off onto SR 136 (Figure 2.1.5.2-3). This

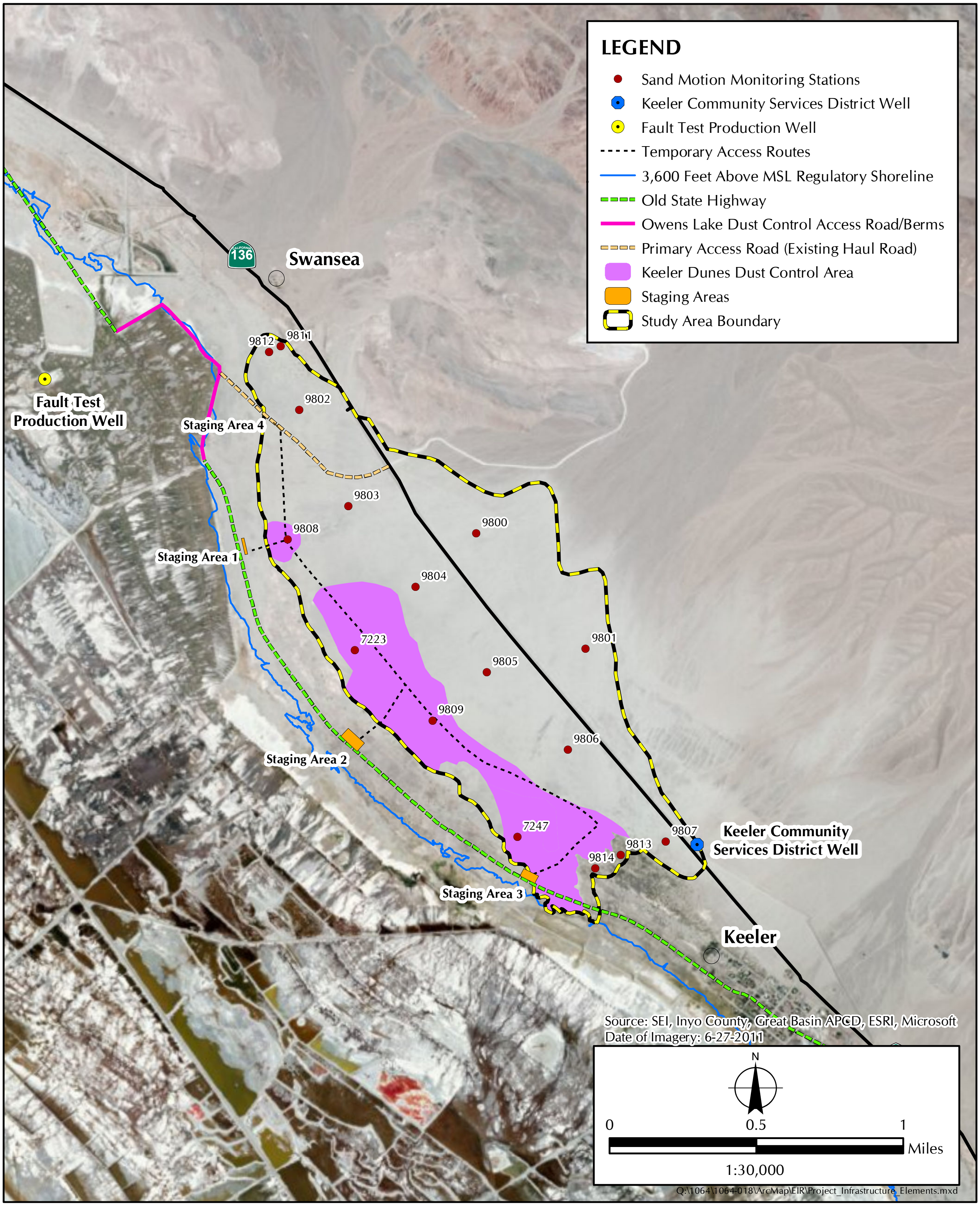

FIGURE 2.1.5.2-3

Location of Infrastructure Elements
Common to All Action Alternatives

staging area will be placed on previously disturbed land within the graveled limits of the existing road; thus, no vegetative removal is necessary. The area will measure approximately 10 feet by 200 feet and will be used primarily for temporary straw bale storage.

Access routes and staging Areas 1, 2, and 3 will require the brushing and grubbing of vegetation in order for them to function and to avoid the greater visual impact of grading. These staging areas will be restored and revegetated after the proposed project / proposed action has been completed.

Access Routes

A designated temporary access route for ATV travel will be used during placement of straw bales and during planting and watering activities. ATVs will be used to haul straw bales and plants to the dust control areas. The temporary access route will be sited to minimize impacts to existing vegetation and avoid cultural resources. The temporary access route will be sited by laying out an alignment that avoids vegetation and sensitive resources, to the maximum extent practicable. Access routes will be established by ATV use. Where vegetation blocks access to a requisite location, selected modification of vegetation may be undertaken to top vegetation to accommodate clearance for ATVs. No supplemental materials such as asphalt or gravel will be used. Following completion of planting and watering activities, the temporary access route will be restored utilizing straw bales and native plants (the same method as used for the dust control areas of the proposed project / proposed action).

The temporary access route from all of the staging areas will be approximately 13,478.7 feet long (2.5 miles) by 20 feet wide following the existing grade (total temporary access route disturbance area is 6 acres). The approximate location of access routes is shown in Figure 2.1.5.2-3. Currently, the proposed project / proposed action and alternatives area can be accessed from SR 136 via the gravel haul road to the north. The Old State Highway through Keeler to the south (the Keeler Dump Road) is not anticipated to be used to access the proposed project / proposed action. The access is from SR 136 and the gravel haul road.

Water Supply, Conveyance, and Distribution

Approximately 5 gallons of water will be applied under each straw bale prior to planting.[32] The plants would also be watered with approximately 3 gallons of water per bale immediately after the plants are placed in the ground. Total water needs during planting are expected to amount to approximately 3.02 acre-feet (985,480 gallons). It is expected that supplemental watering may be provided to the plants during the first 3 years of the proposed project / proposed action when rainfall is less than 50 percent of the average annual rainfall or is needed based on poor plant health. A total of about 5.29 acre-feet of water may be applied during the first year of the proposed project / proposed action. During each of the second, third, years of the proposed project / proposed action the estimated total annual water duty would be about 2.27 acre-feet. The total water demand for the proposed project / proposed action and proposed project / proposed action alternatives is estimated at up to 9.83 acre-feet (3.2 million gallons) over the 3-year period (Table 2.1.5.2-2, *Water Requirements for Proposed Project / Proposed Action*.

[32] Groeneveld, D.P., HydroBio Advanced Remote Sensing. 12 September 2012. Telephone conversation with D. Grotzinger, Sapphos Environmental, Inc., Pasadena, CA.

TABLE 2.1.5.2-2
WATER REQUIREMENTS FOR PROPOSED PROJECT / PROPOSED ACTION

Irrigation Event	Year	Gallons per Bale	Gallons	Acre-feet
Initial irrigation	Fall 2014	5	615,925	1.89
Irrigation at time of planting	Fall 2014	3	369,555	1.13
Supplemental #1	Spring 2015	3	369,555	1.13
Supplemental #2	Fall 2015	3	369,555	1.13
Supplemental #3	Spring 2016	3	369,555	1.13
Supplemental #4	Fall 2016	3	369,555	1.13
Supplemental #5	Spring 2017	3	369,555	1.13
Supplemental #6	Fall 2017	3	369,555	1.13
		Total	**3,203,120**	**9.83**

During the time of planting there will be two irrigation events associated with planting. The first will be conducted prior to planting to pre-wet/pre-condition the soil. The second irrigation will be conducted immediately following planting of the shrubs. Additionally, during the first year of the proposed project / proposed action, the plants may be provided with supplemental water, if needed, in the spring time when they are breaking dormancy for the growing season and again in the late summer as they go into their late season growth spurt. A decision to provide supplemental water will be based on the precipitation and the overall health of the plants.

During each of the first, second, and third years of operation of the proposed project / proposed action, there may be up to two supplemental watering events. The decision to provide supplemental water will be based on the precipitation during the year and the overall health of the plants. The potential watering events will occur in the later winter / early spring and late summer/early fall.

The proposed project / proposed action and action alternatives 1, 2, 3, and 4 assume that the water for plant irrigation will be supplied from the District's 12-inch production well, located at the Fault Test Site, located about 0.7 mile northwest of the proposed project / proposed action boundary (Figure 2.1.5.2-4, *Water Supply*). The Fault Test well is an artesian (flowing) well and is capable of producing 250 gallons per minute (gpm) on a sustained basis.[33] An initial application of water at each straw bale installed in the dust control areas is expected to require approximately 985,480 gallons, which would be applied over a 2- to 4-month period (this includes the pre-planting watering as well as the watering at the time of planting). The Fault Test production well can produce a sustained flow rate of 250 gpm and thus only requires a total flow of 2.7 days to produce enough water for the initial watering. Flow tests conducted at the Fault Test Site have included continuous flows for periods up to 90 days with no observed impacts to the surrounding area. Thus production of the relatively small amount of water needed for the plants on the proposed project / proposed action would not be expected to cause impacts to the local area. Another available water source includes purchased water from the Keeler Community Services District (KCSD) Well located within the southeastern portion of the proposed project / proposed action study area (Figure 2.1.5.2-4).[34]

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[33] Holder, G., Great Basin Unified Air Pollution Control District, Bishop, CA. 9 October 2012. Telephone conversation with D. Grotzinger, Sapphos Environmental, Inc., Pasadena, CA.

[34] Holder, G., Great Basin Unified Air Pollution Control District, Bishop, CA. 20 September 2013. Email to Eric Charlton, Sapphos Environmental, Inc., Pasadena, CA.

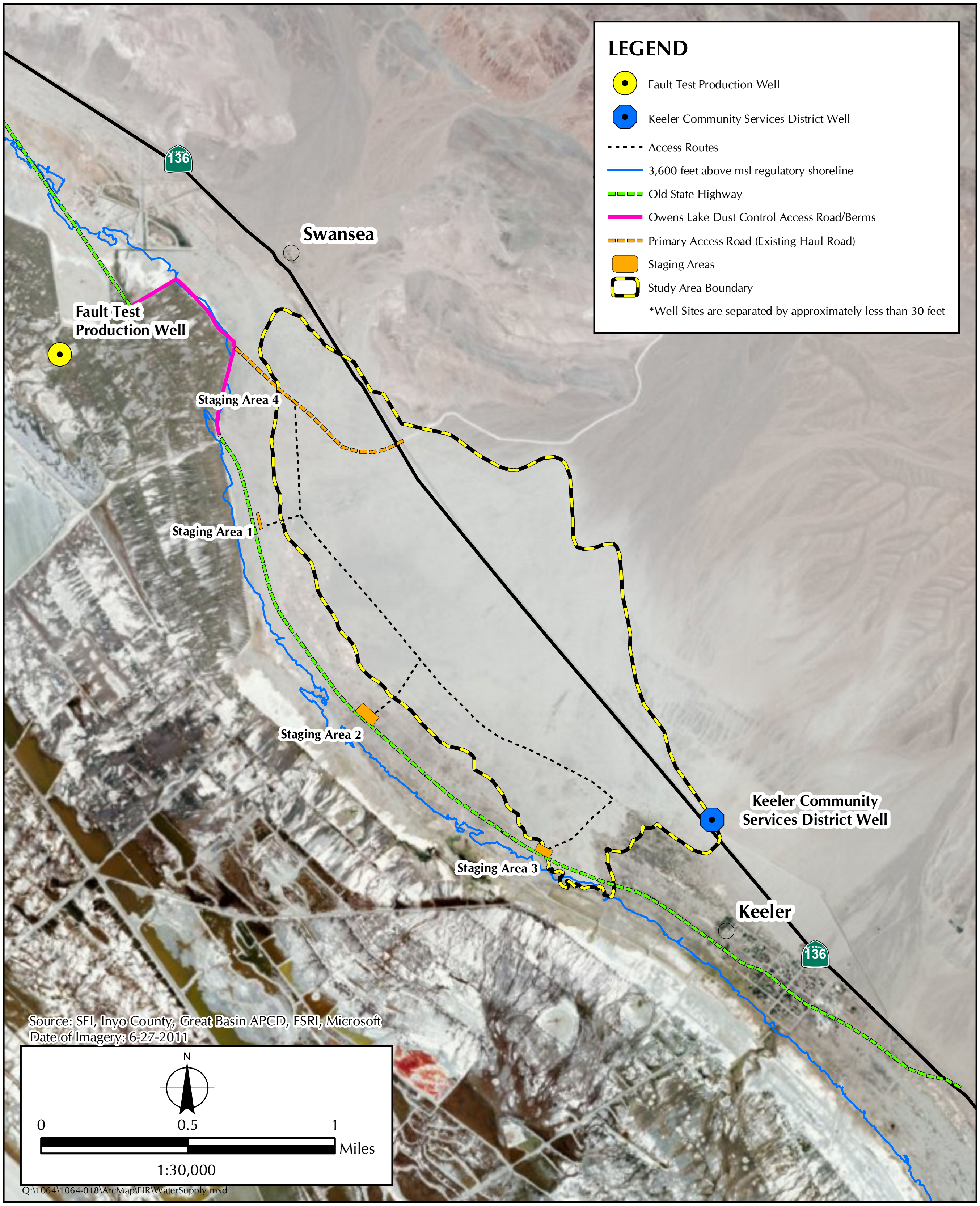

FIGURE 2.1.5.2-4

Water Supply

Effectiveness Monitoring Program

The District currently monitors sand motion activity in the proposed project / proposed action study area with a network of 16 sand motion monitoring sites (Figure 2.1.5.2-3). The monitoring program will continue to operate during and after DCM implementation. Review of sand motion monitoring, plant, and PM_{10} data will be completed at least one time per year and will be evaluated by the District to determine the progress of the proposed project / proposed action in attaining the NAAQS and state standard for PM_{10} and for the need to add supplemental plants and/or straw bales. The District will periodically keep the BLM apprised of general dust abatement progress and fully share the monitoring results if requested.

E. Construction Scenario Common to the Proposed Project / Proposed Action and All Proposed Project / Proposed Action Alternatives

Schedule

Installation of the proposed project / proposed action and proposed project / proposed action alternatives would require up to 11 months to complete, from August 2014 through June 2015. Construction of the proposed project / proposed action and alternatives would be divided into the following parts: (1) temporary access route and staging area(s); (2) bale placement and planting and watering; (3) project oversight and monitoring; and (4) supplemental watering and planting (project operation and maintenance) for a period of 3 years, as required. Supporting project activities would include material delivery, planting, placement of straw bales, water delivery to plants, ongoing monitoring, and transportation of work crews. Site preparation and construction of the proposed project / proposed action and alternatives would be undertaken in accordance with all federal, state, and County of Inyo codes and regulations. In an effort to avoid and minimize impacts to the emissive areas that contain the most sensitive environmental resources, the District has agreed to install the straw bales and native plants on the 177 acres with the lesser level of environmental sensitivity. If attainment is achieved with 177 acres, the additional 17 acres specified for the proposed project/proposed action and Alternatives 1, 2, 3, 4, and 5 would be delayed until the monitoring results confirm for a period of three consecutive years that treatment is not required to achieve attainment or that monitoring demonstrates that exceedances are occurring that warrant treatment. The proposed project/proposed action and proposed project/proposed action alternatives were analyzed on the full build-out scenario, as a reasonable worst case scenario, given the contingent nature of the ability to avoid the environmentally sensitive areas dependent on the outcome of the monitoring data. Workers would normally be present at the proposed action site between 7:00 a.m. and 5:00 p.m., Monday through Friday. During periods of high temperature, work may begin as early as 5:00 a.m.

Access and Egress

Construction employees would be expected to carpool from respective population centers such as Lone Pine, Olancha, or Keeler, California, and report to the designated construction staging area at to the beginning of each work day. It is anticipated that the employees would use the Old State Highway and the Gravel Haul Road from SR 136 for ingress/egress to the proposed project / proposed action property and that, once on-site, they would access various sections by foot and ATV on the designated temporary access route. Site ingress and egress for construction, delivery vehicles, haul routes, and emergency response and evacuation would be located at Staging Area 2 along the Old State Highway (Figure 2.1.5.2-3). Vehicles would turn around at Staging Area 3 and return to SR 136 via the existing Gravel Haul Road (Figure 2.1.5.2-3).

Travel within the proposed project / proposed action area would be restricted to designated access routes. During placement of the bales and planting of the shrubs, it is expected that ATV travel will occur to distribution points within the dunes to unload the bales and plants. From these distribution points the bales and plants will be hand carried or transported in a wheeled hand cart to the specified locations for placement and planting. The number of distribution points is unknown at this time but is expected to be one for every 100 to 200 bales. These distribution points will only be used on a limited basis during active construction of the proposed project / proposed action.

Construction Equipment

The plans and specifications for the proposed project / proposed action and proposed project / proposed action alternatives would include the requirements for construction equipment and average number of hours of operation of the type specified in Table 2.1.5.2-3, *Dust Control Activity, Duration, Equipment, and Workers*. Table 2.1.5.2-3 lists the duration of each activity and maximum number of workers on the site each day.

TABLE 2.1.5.2-3
DUST CONTROL ACTIVITY, DURATION, EQUIPMENT, AND WORKERS

Activity	Duration (months)	Equipment	Workers (maximum)
Site preparation	~ 1 week	GrubberAll-terrain vehicle Pickup truck Trailers	10
Deliver and distribute straw bales over the dust control areas and Planting and watering	6 to 8 months	Semi-trucks with tandem trailers Loader with forks Hay Squeeze All-terrain Vehicles Water Trucks	72
Supplemental Watering	1 to 3 months	All-terrain vehicles Water trucks	13
Cleanup/restoration	~ 2 weeks	Semi-trucks with tandem trailers All-terrain vehicles Loader with forks Dozers and trailers Water trucks Pick-up trucks	20

2.1.5.3 PROJECT DESIGN FEATURES AND BEST MANAGEMENT PRACTICES

A. Workforce

Up to 72 workers would be expected to be on site during peak construction activity periods. Construction equipment would be turned off when not in use. The construction contractor would be required to ensure that all equipment is properly maintained. All vehicles would utilize exhaust mufflers and engine enclosure covers (as designed by the manufacturer) at all times.

B. Worker Education and Awareness Program

A Worker Education and Awareness Plan (WEAP) would be implemented to avoid and minimize potential impacts to resources at the project site. The project contractor would be required to prepare and submit these plans to the BLM and the District for review and approval prior to conducting work at the project site. The WEAP shall describe all the avoidance and minimization measures related to air quality and dust suppression, surface water quality, biological resources, cultural resources, and recreation that have been incorporated into the proposed project / proposed action to avoid significant impact to the environment. The WEAP will describe special-status species of plants and wildlife that have the potential to be present in the Keeler Dunes. The WEAP will describe areas of environmental concern that are off-limits to all construction personnel and equipment. The WEAP will describe the required notification of the County Coroner, should human remains be discovered in the project work area. Alcohol, firearms, and illegal drugs are prohibited in the project site. To prevent harassment or mortality of native wildlife, or destruction of habitat, no pets will be permitted on project sites. All trained workers will be given a sticker to affix to their hardhat that must be visible at all time when working on the site. A list of trained workers will be kept on site, and will be on file with the BLM and the District.

C. Air Quality and Dust Suppression

The transport and installation of straw bales and native plants has the potential for disturbing the soil surface and producing associated fugitive dust. These fugitive dust emissions shall be controlled and minimized through development and implementation by the project contractor of a Fugitive Dust Control Plan, to comply with District Rules 400 and 401 through the application of BACMs during project implementation. All vehicles and equipment used on site will be maintained in good condition. ATVs will be restricted to travel at less than 15 mph to minimize dust levels.

D. Drainages and Wetlands

The proposed project / proposed action has been designed to avoid all areas subject to the jurisdiction of the U.S. Army Corps of Engineers pursuant to Section 404 of the Clean Water Act and the jurisdiction of the CDFW pursuant to Section 1600 of the State Fish and Game Code, including avoidance of areas identified as potential wetlands on the National Wetlands Inventory. There are no wetlands that will be disturbed. One drainage will be crossed but will not be used for DCMs.

The project installation shall be monitored, by the District, during construction to ensure that there is no alteration of drainages. SEI: As disc used at Galley Proof, in the absence of a 1600 Agreement, the District shall notify the contractor and all onsite personnel of the need to avoid any alteration of draingage and monitor that avoidance is achieved during construction.

E. Restoration of Disturbed Areas

Restoration of disturbed areas, such as staging areas and the temporary access route, would occur at the end 3 years or when the plants are established enough such that they do not need any supplemental watering. Restoration will include decompaction as needed and the establishment of native vegetation similar to that used in the project area. If the plants are not established by the end of the 3-year period the District will request an extension in advance so that additional environmental analysis can be undertaken in a timely manner.

F. Cultural Resources Protection

Cultural resources protection is complicated by the shifting sand deposits that result in temporal variations in coverage and exposure of cultural resources. As part of the project design and development process, extensive coordination was undertaken by the District with BLM to develop a conceptual site plan that place project elements in a manner that avoids cultural resources. However, the potential exists, due to the shifting nature of the sand deposits, for additional cultural resources to be exposed prior to the initiation of project installation. Therefore, an additional survey will be undertaken by the District, in consultation with the BLM, directly prior to project implementation. The results of the survey will be used as the basis for the development of the final site plan to be submitted with the ROW application, demonstrating avoidance of potentially significant cultural resources, including any required corresponding refinements associated with the proposed construction scenario. A map of the proposed project / proposed action elements, including their relation to surface artifacts and features, will be provided with the ROW application. Supplemental monitoring of the cultural resources falling within the project area will be undertaken by a qualified archaeologist to ensure that no cultural deposits are adversely affected by the transport and placement of the vegetation and straw bales, and delivery of water via small tanks and hoses mounted on ATVs or temporary irrigation lines. The final site plan will be adjusted to avoid the cultural resources identified in the initial surveys and any additional cultural resources identified as a result of the supplemental surveys.

The supplemental survey for cultural resources will involve the identification and recordation of artifacts and features using handheld global positioning system (GPS) units. A spatial analysis in geographic information systems (GIS) will then be undertaken to determine the specific placement of vegetation, straw bales, footpaths, and routes of travel for ATVs or temporary irrigation lines in relationship to cultural resources to ensure the final site plan avoids these resources. The contractor shall submit a final proposed construction scenario to the BLM for approval that depicts the location of these project elements and their relation to surface artifacts and features. An on-site archaeological monitor will be required to be present during implementation of the DCMs in culturally sensitive areas and a Tribal monitor will be required to be present during the implementation of the DCMs in all areas.

G. Recreation Access / Public Safety

Temporary restrictions for control of public site access for passive recreational purposes shall occur during hours when active construction is under way. During these periods, construction and subsequent project monitoring would be managed by the placement of appropriate signage. In consultation with the BLM Bishop Field Office and the LADWP, signage shall be developed and placed to direct individuals away from the construction and dust control areas to a corridor located east of the dust control areas and parallel to SR 136.

H. Weed Control Plan

Construction of the proposed project / proposed action and alternatives would require preparation of a Weed Control Plan that shall be implemented upon commencement of construction activities. The Weed Control Plan shall include, but not be limited to five preventative measures:

Prevention Measures

a. All landscaping and restoration seeds and plant materials shall be certified weed free.

b. All straw materials shall be certified weed free.

c. Selection of staging areas and the temporary access route shall be done in a way that minimizes disturbance of vegetation.

d. Areas of temporary disturbance shall be vegetated with local native plant species as soon as construction is complete to reduce erosion and inhibit the establishment of invasive weeds.

e. Vehicles and equipment shall be cleaned (with water or high-pressure air) prior to commencing work in off-road areas. Vehicles and equipment shall be cleaned at existing construction yards, legally operating car washes, or on-site washing station(s) at project access points. Once equipment and vehicles have been staged on site, no further washing would be required unless the vehicles or equipment are exposed to populations of nonnative and invasive weeds present on the site or if the equipment leaves the site for a different project and then returns to continue work.

The contractor shall document that all vehicles have been washed prior to entering the proposed project / proposed action work area. A written log shall be kept for all vehicle/equipment washing that states the date, time, and location of washing; type of equipment washed; washing methods used; and staff present during washing of equipment. The log shall include the signature of a responsible staff member. Logs shall be available to the BLM for inspection at any time and shall be submitted to the BLM upon request.

Weed-Control Measures

a. Species-specific control procedures shall be developed for high-priority invasive weeds (as determined through consultation with the BLM staff), including non-native *Salsola* species.

b. Potential weed-control methods shall include physical or mechanical removal, chemical control, and environmental control. Methods shall be approved by the BLM prior to weed control.

c. Weeds shall be removed by the District during the implementation of dust control measures as part of the proposed project / proposed action. Removal methods shall be approved by the BLM prior to implementation.

d. A long-term schedule shall be established for regular weed control throughout the proposed project / proposed action area.

e. A regular weed-control program shall be established that uses approved procedures, properly maintained equipment, and safety gear.

f. Monitoring and follow-up shall be conducted in accordance with the proposed project / proposed action's operational long-term effectiveness monitoring described in the section below.

g. Annual monitoring shall be conducted to assess weed presence and the success of control measures.

h. Remedial (follow-up) control measures shall be implemented by the District under the direction of the BLM if previous procedures have not achieved eradication or control objectives.

Reporting

a. A final report shall be prepared for submittal to the BLM Bishop Field Office at the end of the project construction phase. The report shall document the implementation of the Weed Control Plan, including the outcome of the weed-control measures and recommendations for changes to improve rates of success.

I. Stormwater

The plans and specifications for the proposed project / proposed action would include a requirement for the construction contractor to comply with all provisions of the National Pollution Discharge Elimination System (NPDES) Program administered by the California RWQCB, Lahontan Region, as they relate to avoiding impacts from storm water runoff during construction. Prior to project implementation, the District would be required to prepare a Storm Water Pollution Prevention Plan (SWPPP) and incorporate best management practices (BMPs) consistent with the guidelines provided in the *California Storm Water Quality Handbooks: Construction Site Best Management Practices Manual*.[35] In addition, provisions for a monitoring and maintenance program to address areas needing maintenance would be included to address conditions that pose a threat to water quality. Should the construction period occur during rain events, supplemental erosion and sediment control measures may be implemented, including, but not limited to, the use of:

- Mulching
- Geotextiles and mats
- Earth dikes
- Temporary drains and gullies
- Silt fencing
- Straw-bale barriers
- Sand-bag barriers
- Brush or rock filters

[35] California Stormwater Quality Association. 2003. *California Stormwater Best Management Practice Handbooks: Construction*. Menlo Park, CA. Available at: http://www.cabmphandbooks.com/Documents/Construction/Section_3.pdf

- Sediment traps
- De-silting basins

J. Hazardous Materials Handling and Storage

Small quantities of hazardous materials will be used on site for miscellaneous general maintenance activities associated with straw bale, plant installation, and irrigation during the initial 3 years of the proposed project / proposed action. Hazardous materials are expected to include consumer-sized containers of oils, greases, and small quantities of diesel fuel and gasoline for use with ATVs and generators. To minimize impacts to water quality related to the unauthorized release of hazardous materials into the environment, the project contractor shall prepare a Hazardous Materials Business Plan (HMBP) and Spill Prevention Control and Countermeasure (SPCC) program applicable to all statutes and regulations. The project contractor shall submit the HMBP and SPCCC program to Inyo County for review and approval. The project contractor shall demonstrate approval of the HMBP and SPCC by Inyo County to the District and BLM prior to the use, storage, and handling of hazardous materials in conjunction with construction or operation of the proposed project / proposed action. Only personnel trained in refueling vehicles will be allowed to engage in such activities.

Waste Management

All waste, including trash, litter, garbage, and any other solid waste generated by the proposed project / proposed action, will be removed to a disposal facility authorized to accept such materials. Commercial garbage collection and hauling may be contracted to remove waste and recyclable materials. During project activities, all waste will be stored in a manner that wildlife cannot access it. In the event that straw bales with non-degradable binding are used for the proposed project / proposed action, at the end of the project maintenance period, plastic or other non-degradable binding materials will be removed from all bales and be collected and removed from the proposed project / proposed action area. This waste will be taken to a disposal facility authorized to accept such materials or will be recycled.

Portable toilets for on-site personnel will be provided at staging areas 1, 2, and 3 and removed for each 30-day period when on-site personnel are not scheduled to be present.

K. Special Status Plants / BLM Sensitive Plants

If prior to or during construction of the proposed project / proposed action Special Status Plants / BLM Sensitive Plants are found (on public land administered by the BLM) in the project area they would be avoided and/or impacts would be mitigated under the guidance of the BLM.

L. Migratory Birds

If project activities occur during migratory bird nesting season (March 15-–July 30), a nesting bird survey must be conducted at least one week before the onset of construction to determine the presence or absence of nesting birds. If nesting birds are observed, work activities shall be avoided within 100 feet of active nests until it has been determined that the young have left the nest.

2.1.5.4 Operation and Maintenance

Once the project elements are in place, the site would be monitored regularly for a period of 3 years to evaluate the vegetation growth progress, assess plant mortality and herbivory, assess the need for additional watering, check the physical condition of straw bales, and replant as necessary. Review of DCM effectiveness will be completed at least one time per year and will be reported with recommendations, as appropriate, for adding supplemental plants and/or straw bales as needed to achieve the NAAQS for PM_{10}.

Monitoring for plant survivorship will occur more frequently in the first year of the proposed project / proposed action and less frequently as the plants establish themselves in subsequent years.

2.2 PROPOSED PROJECT / PROPOSED ACTION ALTERNATIVES INCLUDING THE PROPOSED PROJECT / PROPOSED ACTION

This EIR/EA evaluates the proposed project / proposed action and five proposed project / proposed action alternatives:

- Alternative 1, Dust Control Measures Applied to 214 Acres Using Irrigation Water Delivered via Water Trucks / ATVs;
- Alternative 2, Dust Control Measures Applied to 197 Acres Using Irrigation Water Delivered via Water Trucks / ATVs;
- Alternative 3, Dust Control Measures Applied to 194 Acres Using Irrigation Water Delivered via Water Trucks / Tanks / PVC Irrigation System and Selected Manual Watering;
- Alternative 4, Dust Control Measures Applied to 194 Acres Using Irrigation Water Delivered via Water Trucks / PVC Irrigation System and Selected Manual Watering ; and
- Alternative 5, Dust Control Measures Applied to 194 Acres Using Irrigation Water Delivered via KCSD Water Well / Pipeline to Irrigation System and Selected Manual Watering.

The following subsections present the proposed project / proposed action and the alternatives. The primary differences between the alternatives can be found in (1) the area extent of the area to be treated (project size), (2) the density of plants and straw bales that correlates to the dust control efficiency, and (3) the source and method of supplying water to the proposed project / proposed action area for plant irrigation. Furthermore, the vehicle miles traveled (VMTs) associated with the proposed project / proposed action differ for each source and method of supplying water for both ATVs and water trucks as presented in Table 2.2-1, *VMTs for Proposed Project / Proposed Action and Proposed Project / Proposed Action Alternatives*.

TABLE 2.2-1
VMTS FOR PROPOSED PROJECT / PROPOSED ACTION
AND PROPOSED PROJECT / PROPOSED ACTION ALTERNATIVES

Proposed Project / Proposed Action or Alternative	Year	VMT for ATVs	VMT for Water Trucks
Proposed Project / Proposed Action	2014	6,568	541
	2015	4,924	422
	2016	4,924	422
	2017	4,924	422
	Total	**21,340**	**1,807**
Alternative 1	2014	6,568	541
	2015	4,924	422
	2016	4,924	422
	2017	4,924	422
	Total	**21,340**	**1,807**
Alternative 2	2014	6,568	541
	2015	4,924	422
	2016	4,924	422
	2017	4,924	422
	Total	**21,340**	**1,807**
Alternative 3	2014	842	541
	2015	674	422
	2016	674	422
	2017	674	422
	Total	**2,864**	**1,807**
Alternative 4	2014	842	541
	2015	674	422
	2016	674	422
	2017	674	422
	Total	**2,864**	**1,807**
Alternative 5	2014	842	0
	2015	674	0
	2016	674	0
	2017	674	0
	Total	**2,864**	**0**

2.2.1 PROPOSED PROJECT / PROPOSED ACTION

The proposed project / proposed action would implement DCMs (native vegetation and straw bales) on 194 acres of the project study area. The District designed the proposed project / proposed action to minimize environmental impacts by applying two different dust control levels at the project site (Figure 2.2.1-1, *Dust Control Measure Locations and Minimum Efficiency Requirements*). A dust control efficiency of 95 percent would be implemented on approximately 177 acres and would result in an immediate cover by the bales of approximately 12.1 percent. The proposed project / proposed action would implement 85 percent control on 17 acres, resulting in a 6.7 percent bale cover. Additional surface cover is expected from the shrubs as they fully develop and mature. The total acreage (177 acres + 17 acres) for DCMs to which native vegetation would be applied is 194 acres. Approximate numbers of plants and straw bales necessary to achieve an estimated 85 and 95 percent dust control efficiency on a total of 194 acres are summarized in Table 2.2.1-1, *Proposed Project / Proposed Action Dust Control Applied to 194 Acres*.

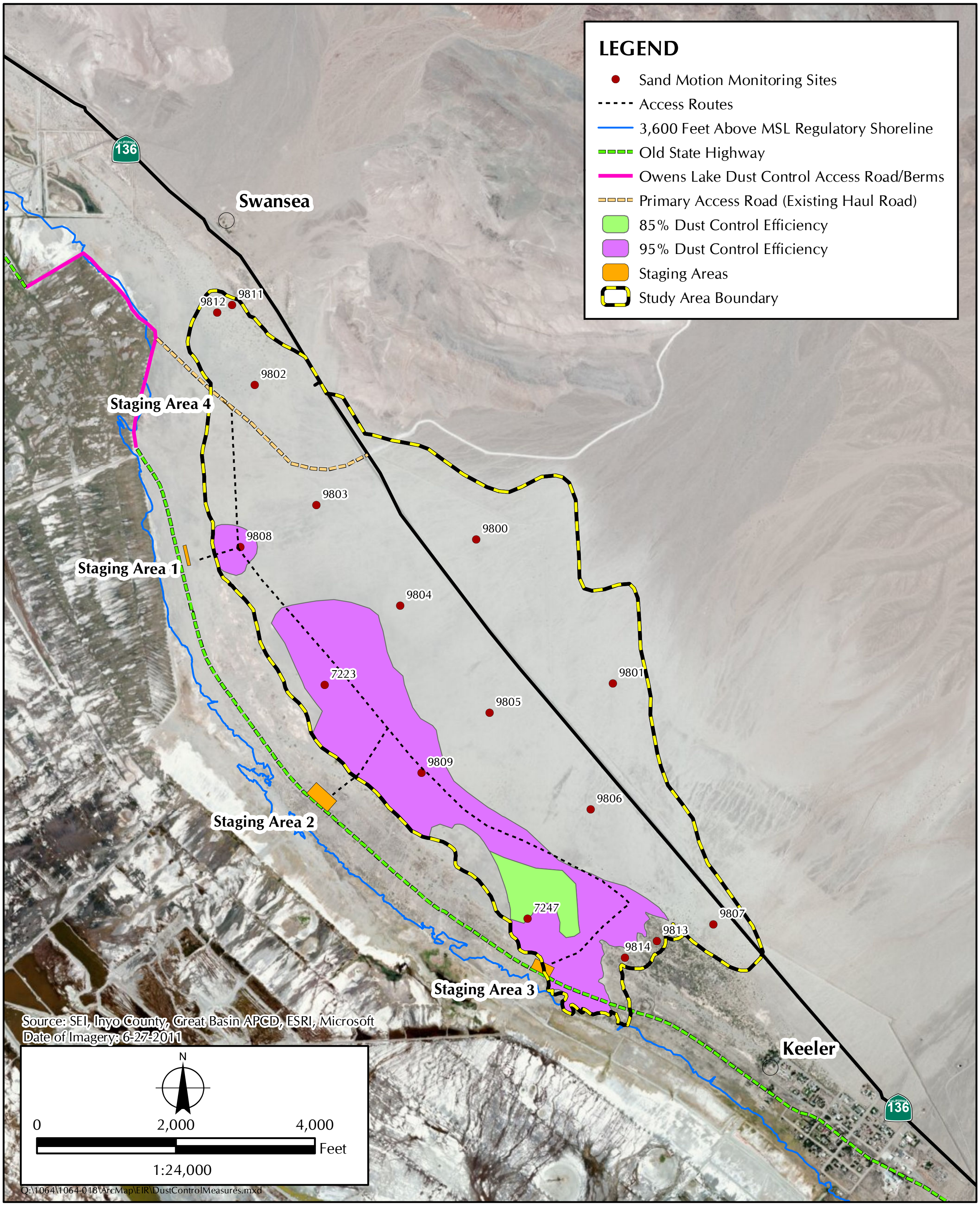

FIGURE 2.2.1-1

Dust Control Measure Locations
and Minimum Efficiency Requirements

TABLE 2.2.1-1
PROPOSED PROJECT / PROPOSED ACTION DUST CONTROL APPLIED TO 194 ACRES

Element	Minimum Control Efficiency (%)	Number of Acres	Number Required per Acre	Total Number Required
Native plants	95	177	1,983	350,991
Native plants	85	17	1,092	18,564
Total plants				**369,555**
Straw bales*	95	177	661	116,997
Straw bales	85	17	364	6,188
Total straw bales				**123,185**

Note: * The dimensions of the straw bales are 0.6 x 0.4 x 1.17 meters.

The water supply for plant irrigation will come from the Fault Test well and will be delivered via 8,000 gallon water trucks to each of the three staging areas along the Old State Highway. Water would be transferred to the small ATV water tanks directly from water trucks that would park in the staging areas. Water will then be applied via ATVs towing a trailer with a water tank (~150 to 200 gallon capacity) into the proposed project / proposed action area. The initial irrigation during planting would take approximately 15 weeks to complete.[36] Each supplemental irrigation event would take a crew of 10 workers approximately 10 weeks. See Table 2.1.5.2-2 for a summary of the water requirements for the irrigation events included in the proposed project / proposed action.

2.2.2 ALTERNATIVE 1, DUST CONTROL MEASURES APPLIED TO 214 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / ATVS

Alternative 1 has DCMs applied at different intensities in different areas of the Keeler Dunes, and the total acreage treated is 20 acres larger than the proposed project / proposed action (Figure 2.2.2-1, *Alternative 1, Dust Control Measures Applied to 214 Acres*). This alternative focuses on controlling the highest dust emitting areas in the un-vegetated sand dunes by applying more closely spaced straw bales and plants (95 percent control efficiency) over 140 acres. Straw bales and plants would be placed in the inter-dune sand sheet areas (74 acres) at 90 percent control efficiency. Table 2.2.2-1, *Alternative 1, Dust Control Measures Applied to 214 Acres Via Water Trucks / ATVs*, summarizes the acreage treated and the approximate number of plants and straw bales necessary to achieve an estimated 90 and 95 percent dust control efficiency.

[36] Assuming a crew of 10 workers working 5 days a week.

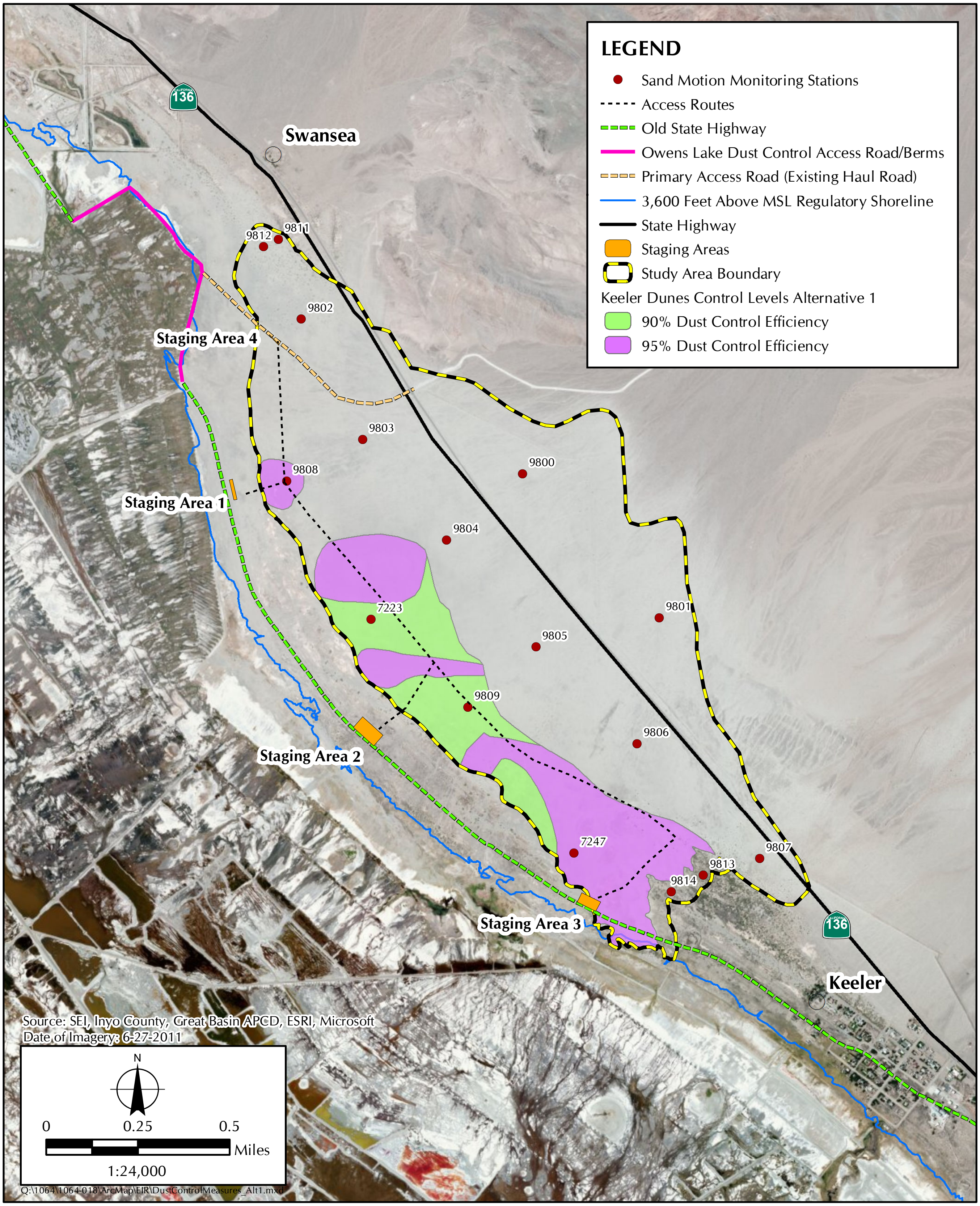

FIGURE 2.2.2-1
Alternative 1, Dust Control Measures Applied to 214 Acres

TABLE 2.2.2-1
ALTERNATIVE 1, DUST CONTROL MEASURES APPLIED TO 214 ACRES VIA WATER TRUCKS / ATVS

Element	Minimum Control Efficiency	Number of Acres	Number Required per Acre	Total Number Required
Native vegetation	95 percent	140	1,983	277,620
Native vegetation	90 percent	74	1,383	102,342
Total plants				**379,962**
Straw bales*	95 percent	140	661	92,540
Straw bales	90 percent	74	461	34,114
Total straw bales				**126,654**

Note: * The dimensions of the straw bales are 0.6 x 0.4 x 1.17 meters.

Under Alternative 1, construction would be essentially the same as for the proposed project / proposed action as described in Section 2.1.5.2, *Project Elements Common to All Project / Action Alternatives*. The primary difference between the alternatives would be the total number of plants and straw bales that would be transported to the project site and distributed onto a larger area (20 additional acres) of dust control. As with the proposed project / proposed action, supplemental irrigation in the first 3 years following installation of native vegetation would be completed via hauling of water in small water tanks (about 150–200 gallons) mounted on a trailer and pulled with an ATV and then irrigation would be conducted by hand through a small diameter hose. Alternative 1 would result in a greater number of plants and straw bales; hence, additional workers and equipment may be necessary to complete the alternative in the same time frame as the proposed project / proposed action.

2.2.3 ALTERNATIVE 2, DUST CONTROL MEASURES APPLIED TO 197 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / ATVS

Alternative 2 has DCMs applied at different intensities in different areas of the Keeler Dunes, and the total acreage treated is 3 acres larger than the proposed project / proposed action (Figure 2.2.3-1, *Alternative 2, Dust Control Measures Applied to 197 Acres*). This alternative focuses on applying the highest intensity of dust control (95 percent control efficiency) across the Keeler Dunes and inter-dune sand sheet areas (170 acres), while applying less intensive controls on other inter-dune areas (27 acres at 90 percent dust control efficiency). Alternative 2 would control the highest dust emitting areas of the dunes by applying more closely spaced straw bales and plants at these locations. Table 2.2.3-1, *Alternative 2, Dust Control Measures Applied to 197 Acres.* summarizes the acreage treated and the approximate number of plants and straw bales necessary to achieve an estimated 90 and 95 percent dust control efficiency.

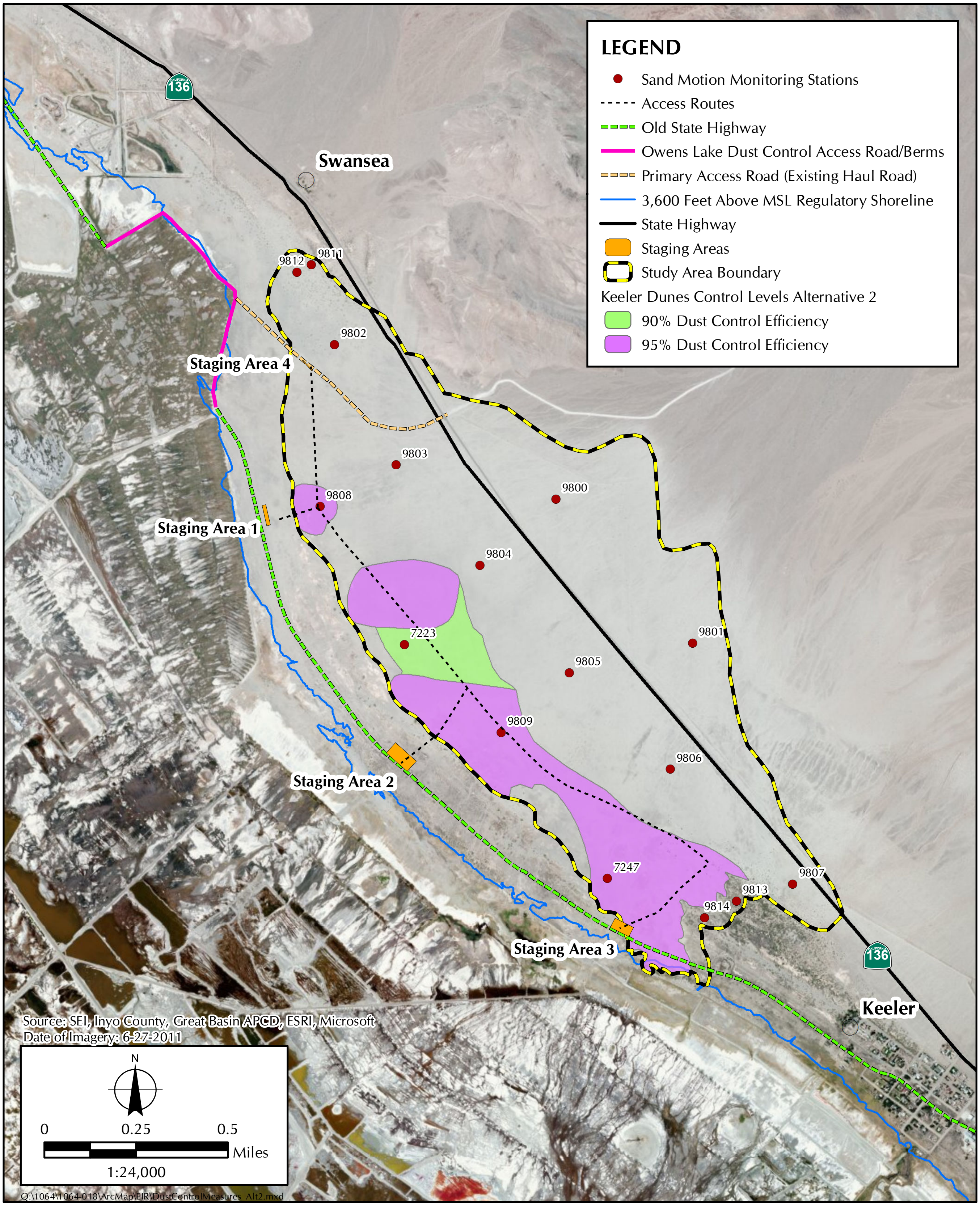

FIGURE 2.2.3-1

Alternative 2, Dust Control Measures Applied to 197 Acres

TABLE 2.2.3-1
ALTERNATIVE 2, DUST CONTROL MEASURES APPLIED TO 197 ACRES VIA WATER TRUCKS / ATVS

Element	Minimum Control Efficiency	Number of Acres	Number Required per Acre	Total Number Required
Native vegetation	95 percent	170	1,983	337,110
Native vegetation	90 percent	27	1,383	38,724
Total plants				**375,834**
Straw bales*	95 percent	170	661	116,997
Straw bales	90 percent	27	461	12,908
Total bales				**129,905**

Note: * The dimensions of the straw bales are 0.6 x 0.4 x 1.17 meters.

Under Alternative 2, construction would be essentially the same as for the proposed project / proposed action as described in Section 2.1.5.2, *Project Elements Common to All Project / Action Alternatives*. The primary difference between the proposed action and Alternative 2 would be the total number of plants and straw bales that would be transported to the project site and distributed onto a slightly larger area (3 additional acres). As with the proposed project / proposed action, supplemental irrigation in the first 3 years following installation of native vegetation would be completed via hauling of water in small water tanks (about 150–200 gallons) mounted on a trailer and pulled with an ATV and then irrigation would be conducted by hand through a small diameter hose.

2.2.4 ALTERNATIVE 3, DUST CONTROL MEASURES APPLIED TO 194 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / TANKS / PVC IRRIGATION SYSTEM AND SELECTED MANUAL WATERING

Alternative 3 integrates refinements to the proposed project / proposed action that resulted from lessons learned from the pilot study that was undertaken by the District to assess the feasibility of the proposed project / proposed action and to address concerns that were raised by representatives of the Native American tribes during the consultation that was undertaken pursuant to Section 106 of the National Historic Preservation Act. Under Alternative 3, the dust control measures would be the same as the proposed project / proposed action. Water obtained from the District's production well at the Fault Test site would be transported to the site via large water trucks to temporary storage tanks located at the three of the four designated staging areas. Since the staging areas are lower in elevation than the Alternative 3 area, each staging area with a water tank would need to have a manifold and booster pump to pressurize the irrigation system. Pumps would be two to three Horse Power electric booster pumps that would be operated during daylight hours when there is active watering of the project area. Due to the nature and size of the electric booster pumps, it is anticipated that potential noise impacts associated with the pumps would be negligible. Furthermore, the ambient noise in the vicinity of the booster pumps, which is dominated by high winds, would prevent a perceivable audible difference in ambient noise from the booster pumps. The use of water tanks mounted on ATVs, to distribute supplemental irrigation during the operations and maintenance phase of Alternative 3, would be replaced with a temporary aboveground irrigation system that would be installed within the 95-percent control level area to provide water to the Alternative 3 area. Plants within the sensitive 85-percent control area would be manually watered using the same method as described proposed project / proposed action. In the environmentally sensitive areas, the ATV mounted tanks would be filled with water from the delivery system within the Alternative 3 site instead of from trucks at the staging areas. Figure 2.2.4-1, *Alternative 3, Manual Watering and Irrigation Schematic with Delivery from the Old State Highway*, provides a map of the temporary irrigation system for Alternative 3.

In Alternative 3, the temporary irrigation system would be designed such that irrigation laterals are placed every 150 feet across the Alternative 3 site, rather than extending to each straw bale. The water from the 2-inch lateral lines would be delivered to the plant locations through detachable hoses. Alternative 3 includes travel into the area by ATV to the hose attachment points along the distribution lateral lines. Watering of individual plants in the vicinity of the hose attachment points would be conducted by a worker on foot.

All travel associated with irrigation would be along the designated access routes and lateral lines. In Alternative 3, the water trucks would only be present at the staging areas during times of active watering. The water trucks would be parked off-site at night and on weekends, at the Fault Test Well site, or other existing parking or staging area in the vicinity of Owens Lake. This alternative would reduce the amount of travel in the dunes by approximately 80 percent, as compared to the proposed project/proposed action. At locations where the access route crosses irrigation lines, temporary protective covers would be placed over the piping to allow travel over the system and prevent damage to the irrigation system. There would be approximately 124 total crossings of the irrigation lines (with 62 crossings of the 2-inch distribution laterals and 62 crossings of the 4-inch transmission line). An estimated 4,500 miles of travel are required over the course of the first 3 years for watering all of the plants in the Alternative 3 area (Table 2.2-1). The initial irrigation during planting would take approximately 8 weeks to complete. Each supplemental irrigation event would take approximately 5 weeks. Following the completion of each irrigation event the irrigation system would be drained of water. Each distribution lateral will have a drain valve installed. Approximately 200 gallons of water will be drained from each lateral in a manner to prevent flows off of the project area.

2.2.5 ALTERNATIVE 4, DUST CONTROL MEASURES APPLIED TO 194 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / PVC IRRIGATION SYSTEM AND SELECTED MANUAL WATERING

Alternative 4 integrates refinements to the proposed project / proposed action that resulted from lessons learned from the pilot study that was undertaken by the District to assess the feasibility of the proposed project / proposed action and to address concerns that were raised by representatives of the Native American tribes during the consultation that was undertaken pursuant to Section 106 of the National Historic Preservation Act. Under Alternative 4, the DCMs would be the same as the proposed project / proposed action. In Alternative 4, water obtained from the Fault Test Well would be transported to the site via water trucks. The water delivery system would be fed from three supply points along SR 136. As with Alternative 3, plants within the 95-percent control area would continue to be watered with hoses attached to the laterals of the temporary PVC irrigation system. In this alternative, water trucks would stage at turnouts built near to the highway and deliver water directly in to the temporary PVC irrigation system, rather than utilizing water tanks at the staging areas for temporary storage as proposed in Alternative 3. As in Alternative 3, hand watering would be done in approximately 8 percent of the dust control area using hoses to deliver water from tanks mounted on ATVs. The ATV mounted tanks would be filled with water from the delivery system within the project instead of from tanks at the staging areas or from the trucks at the turnouts. Figure 2.2.5-1, *Alternative 4, Manual Watering and Irrigation Schematic Along State Route 136,* provides a map of the temporary irrigation system for Alternative 4.

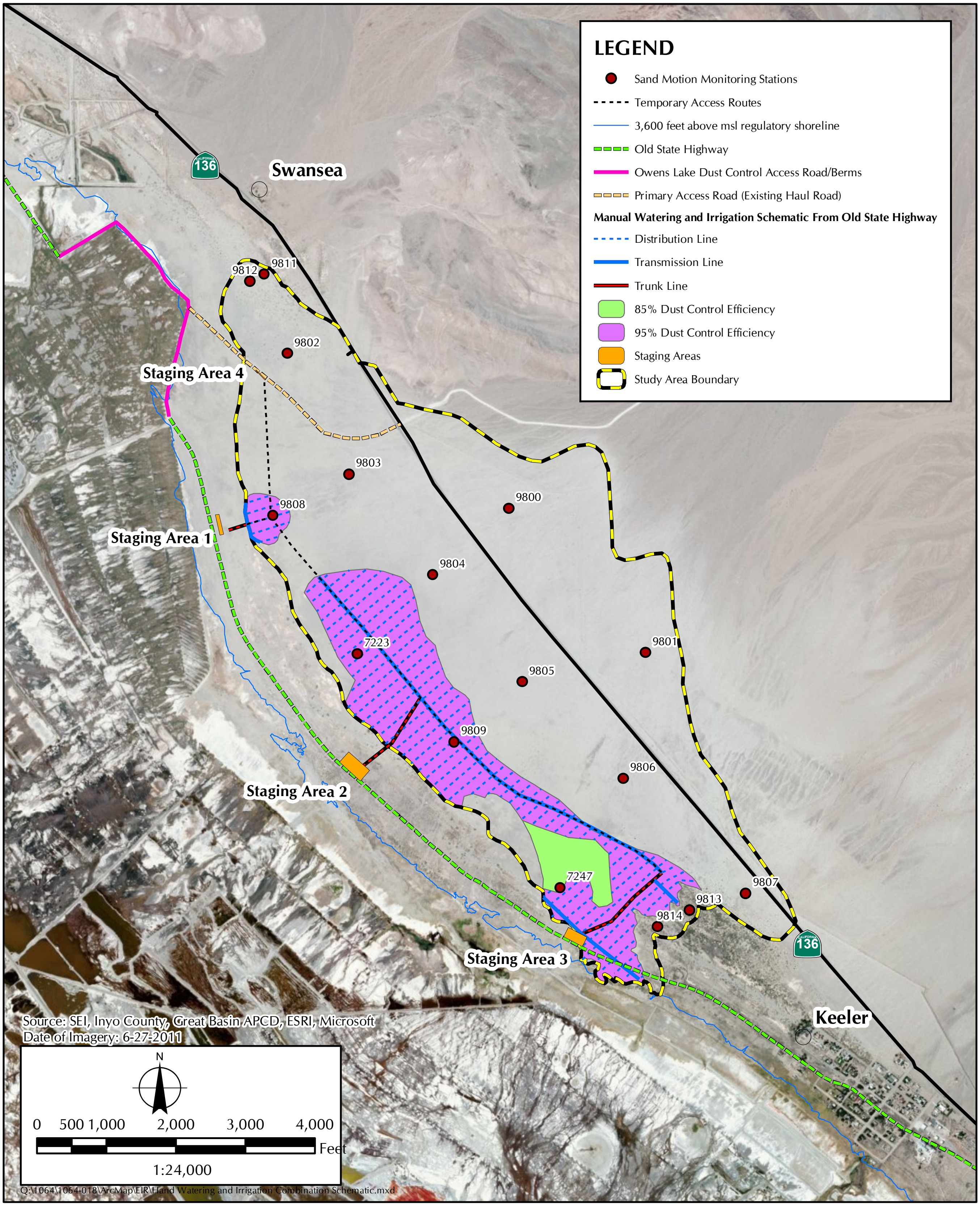

FIGURE 2.2.4-1

Alternative 3, Manual Watering and Irrigation Schematic From Old State Highway

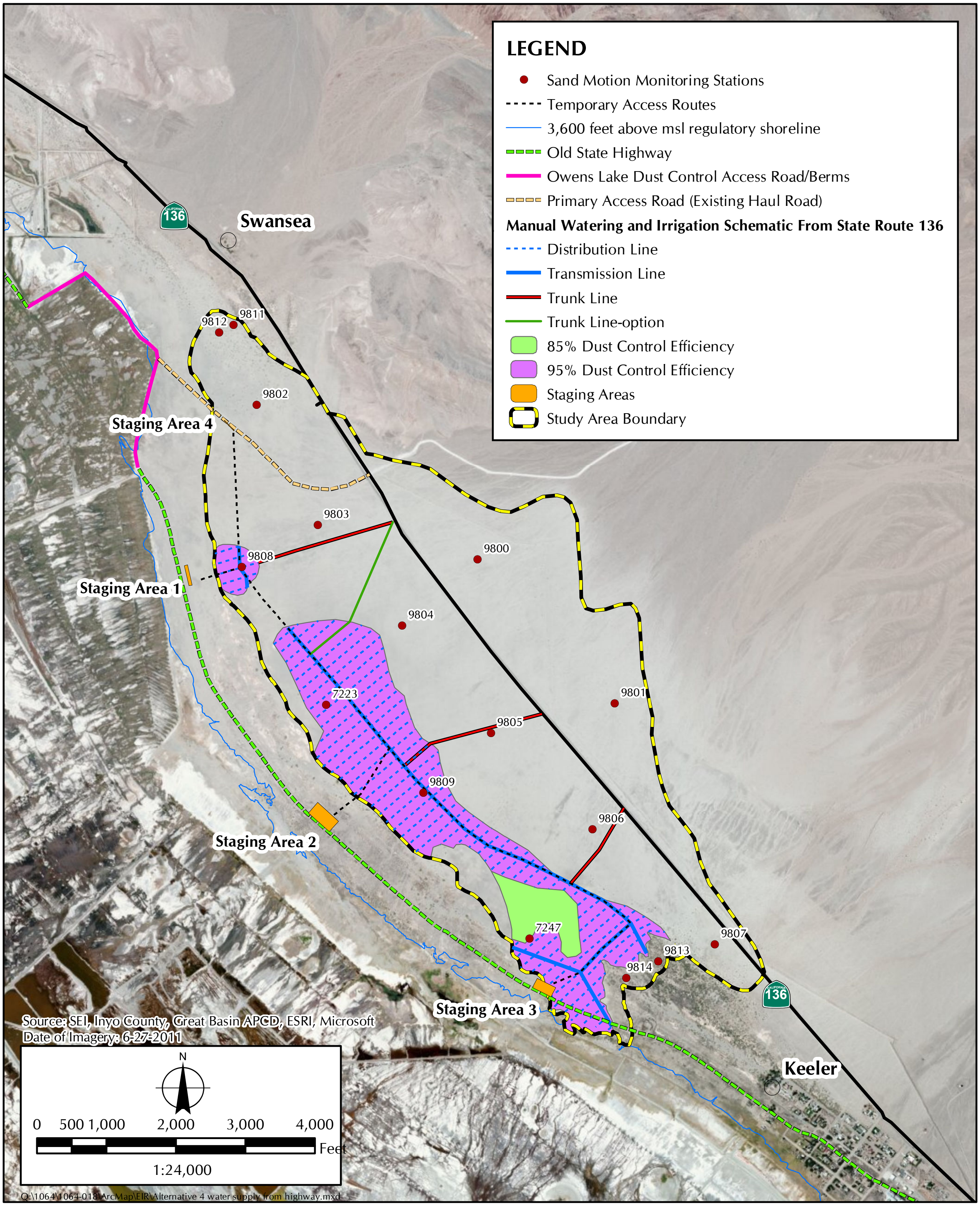

FIGURE 2.2.5-1

Alternative 4, Manual Watering and Irrigation Schematic From State Route 136

As in Alternative 3, in this alternative the temporary irrigation system would be designed such that distribution laterals would be placed every 150 feet across the site, rather than extending directly to each straw bale. The water from the lateral lines would be delivered to the plant locations through detachable hoses. This option includes travel into the project area from the staging areas by ATV to the hose attachment points along the lateral lines. Watering of individual plants in the vicinity of the hose attachment points would be conducted by a worker on foot. All travel associated with irrigation would be along the designated access routes and lateral lines. The ATV travel in the project in Alternative 4 is comparable to that in Alternative 3 and is approximately 80 percent as compared to the proposed project / proposed action. At locations where the access route crosses irrigation lines, temporary protective covers would be placed over the piping to allow travel over the system and prevent damage to the irrigation system. There would be approximately 124 total crossings of the irrigation lines (with 62 crossings of the 2-inch distribution laterals and 62 crossings of the 4-inch transmission line).

In Alternative 4, the water trucks would be temporarily staged at the designated turnouts during times of active watering. Three turnouts would be established along the west side of SR 136 for water truck staging. The water trucks would be parked off-site at night and on weekends, at the Fault Test Well site, or other existing parking or staging area in the vicinity of Owens Lake. Since the turnouts along SR 136 are higher in elevation than the entire dust control project, the system would be gravity fed and no booster pumps and engines would be required. Following the completion of each irrigation event the irrigation system would be drained of water. Each distribution lateral will have a drain valve installed. Approximately 200 gallons of water will be drained from each lateral in a manner to prevent flows off of the project area.

2.2.6 ALTERNATIVE 5, DUST CONTROL MEASURES APPLIED TO 194 ACRES USING IRRIGATION WATER DELIVERED VIA KCSD WATER WELL / PIPELINE TO IRRIGATION SYSTEM AND SELECTED MANUAL WATERING

Alternative 5 integrates refinements to the proposed project / proposed action that resulted from lessons learned from the pilot study that was undertaken by the District to assess the feasibility of the proposed project / proposed action and to address concerns that were raised by representatives of the Native American tribes during the consultation that was undertaken pursuant to Section 106 of the National Historic Preservation Act. Under Alternative 5, the dust control measures would be the same as the proposed project / proposed action. In Alternative 5, water obtained from the KCSD well would be transported to the site via a temporary pipeline that connects into the KCSD water system near the KCSD well site. Water would be supplied directly to the temporary irrigation system from the KCSD, in lieu of the District's Fault Test well. As with Alternatives 3 and 4, Alternative 5 would include a temporary aboveground irrigation system installed within the 95-percent control level area to provide water to the project area. The irrigation system will require the use of one small electric booster pump to achieve sufficient water pressure. Plants within the 85-percent control area would be watered by hand using the same method as described above. The ATV mounted tanks would be filled with water from the delivery system within the project. Figure 2.2.6-1, *Alternative 5, Manual Watering and Irrigation Schematic with KCSD Well*, provides a map of the temporary irrigation system for Alternative 5.

The pipeline would be routed under SR 136 using directional drilling under the existing roadway to avoid impacts to SR 136. In order to install the pipe under the SR 136, a temporary disturbance of approximately 50-feet by 50 feet on each side of the road would be required for the drilling

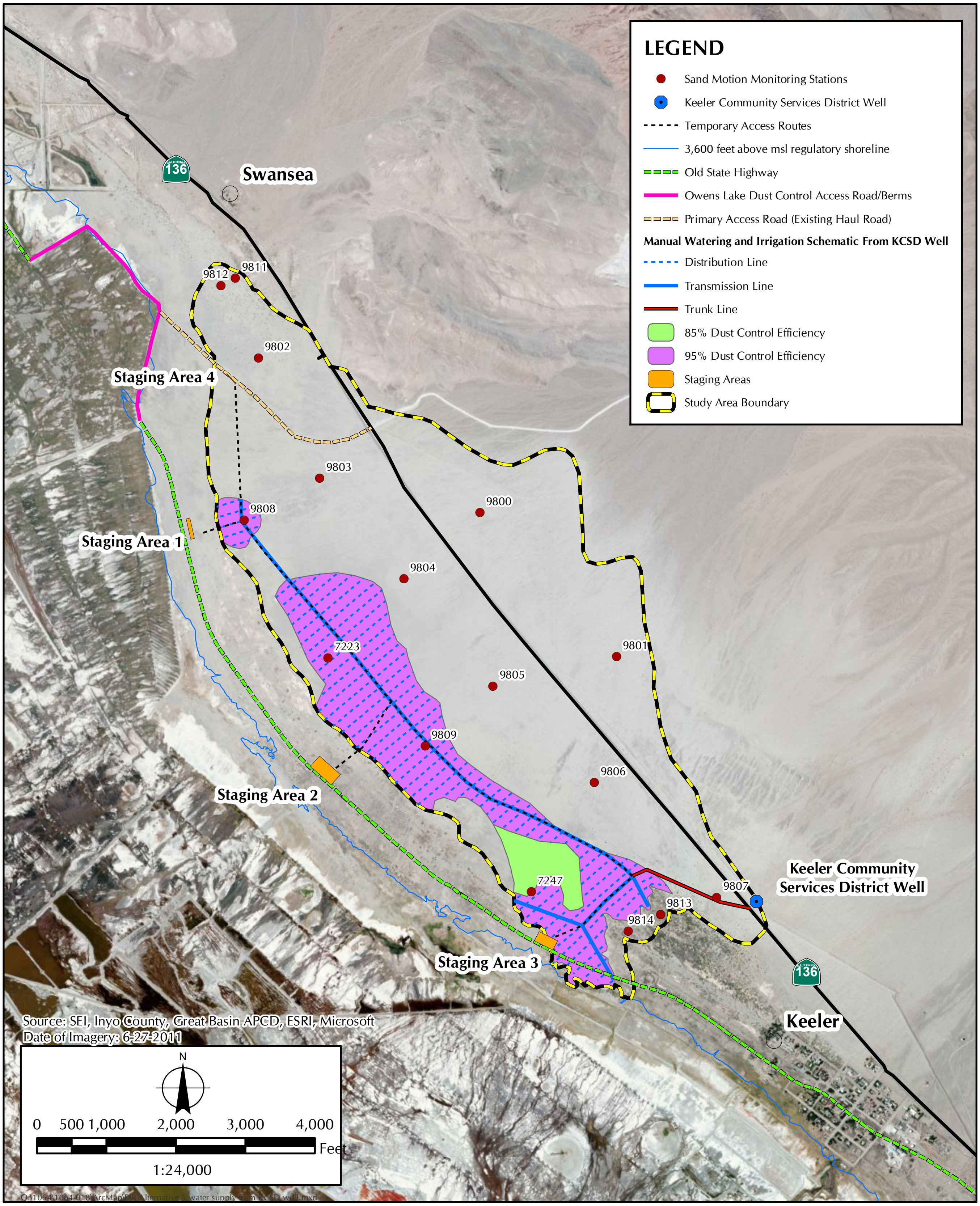

FIGURE 2.2.6-1

Alternative 5, Manual Watering and Irrigation Schematic From KCSD Well equipment. In order to have sufficient water pressure in the irrigation system, a small 2-3 horsepower electric pump may be used near the KCSD well.

As in Alternatives 3 and 4 the temporary irrigation system would be designed such that irrigation laterals are placed every 150 feet across the site, rather than extending directly to each straw bale. The water from the lateral lines would be delivered to the plant locations through detachable hoses. This option includes travel into the Alternative 5 area by ATV from the staging areas to the hose attachment points along the lateral lines. Watering of individual plants in the vicinity of the hose attachment points will be conducted by a worker on foot. All travel associated with irrigation would be along the designated access routes and lateral lines. At locations where the access route crosses irrigation lines, temporary protective covers would be placed over the piping to allow travel over the system and prevent damage to the irrigation system. There would be approximately 124 total crossings of the irrigation lines (with 62 crossings of the 2-inch distribution laterals and 62 crossings of the 4-inch transmission line).

This option has similar mileage requirements to those in Alternatives 3 and 4 and reduces the amount of travel in the dunes by approximately 80 percent as compared to the proposed project / proposed action. Since Alternative 5 would deliver water directly to the site via a water line from the KCSD system, there would be no water trucks required to support the irrigation efforts. In the absence of water trucks, this alternative would reduce vehicle miles traveled by approximately 628 miles per year. The duration of watering events for Alternative 5 is similar to Alternatives 3 and 4 with the initial irrigation during planting taking approximately 8 weeks to complete and each supplemental irrigation event taking approximately 5 weeks. Following the completion of each irrigation event the irrigation system would be drained of water. Each distribution lateral will have a drain valve installed. Approximately 200 gallons of water will be drained from each lateral in a manner to prevent flows off of the project area.

2.3 NO PROJECT / NO ACTION ALTERNATIVE

2.3.1 ALTERNATIVE 6, NO PROJECT / NO ACTION ALTERNATIVE

The No Action Alternative is the functional equivalent of the No Project Alternative under CEQA (CEQA Guidelines Section 15126.6(e)). Under the No Project / No Action Alternative, no DCMs would be implemented at the Keeler Dunes. During high wind events, the Keeler Dunes would continue to emit levels of windblown dust that cause and contribute to exceedances of the NAAQS and California State 24-hour standard for PM_{10} air pollution in the communities of Keeler and Swansea. In addition, under the No Project / No Action Alternative, one of the continuing dust sources in the Owens Valley Planning Area would not be remediated, contributing to noncompliance in this area and jeopardizing attainment of NAAQS for PM_{10}, as required under the 2008 SIP.

2.4 CEQA COMPARISON OF IMPACTS BY ALTERNATIVE

Table 2.4-1, *Temporary Impacts by Alternatives*, summarizes the temporary impacts of the proposed project / proposed action and each alternative. As required pursuant to CEQA, Table 2.4-2, *Comparison of Alternatives*, presents a comparison of the differences in impacts among the alternatives described in Sections 2.2 and 2.3 above. The information in Table 2.4-2 is derived from the analysis of environmental consequences presented in Section 4.0, *Environmental Consequences*.

TABLE 2.4-1
TEMPORARY IMPACTS BY ALTERNATIVES*

Proposed Project / Proposed Action or Alternatives	Staging Areas (acres)	Temporary Access Routes (acres)	Irrigation Transmission Lines (acres)	Irrigation Distribution Lines** (acres)	Temporary Impact (15% of DCM Area***	Trunk Lines (acres)	Total Temporary Impact (acres)	Total Temporary Impacts from Irrigation System (acres)	Total Temporary Impacts from Staging Areas and Access Roads (acres)
Proposed Project / Proposed Action	3.2	6	0	0	23.9	0	33.1	0	9.3
Alternative 1	3.2	6	0	0	23.9	0	33.1	0	9.3
Alternative 2	3.2	6	0	0	23.9	0	33.1	0	9.3
Alternative 3	3.2	6	0.7	23.2	0	0	33.1	8.2	9.3
Alternative 4	3.2	6	0.7	23.2	0	3	36.1	11.3	9.3
Alternative 5	3.2	6	0.7	23.2	0	0.7	33.8	9.0	9.3
Alternative 6: No Action	0	0	0	0	0	0	0	0	9.3

Notes: * Based on a 10-foot buffer on either side of all project elements except staging areas
**Temporary area impact calculations do not combine irrigation system area with temporary access route area
*** Based on coverage of project infrastructure elements such as roads and irrigation with a 10′ buffer on either side.

TABLE 2.4-2
COMPARISON OF ALTERNATIVES

Resource	Proposed Project / Proposed Action (194 acres) Water Truck / ATVs	Alternative 1 (214 acres) Water Trucks / ATVs	Alternative 2 (197 acres) Water Trucks /ATVs	Alternative 3 (194 acres) Water Trucks / Tanks PVC Irrigation System Selected Manual	Alternative 4 (194 acres) Water Trucks / Roadside PVC Irrigation System Selected Manual	Alternative 5 (194 acres) KCSD Water Well Pipeline PVC Irrigation System Selected Manual	Alternative 6 No Project / No Action
Aesthetics / Visual Resources	No effect on scenic vista; no adverse effect on substantially damaging scenic resources; no adverse effect on substantially degrading existing visual character and quality; no effect on creating a new source of light or glare. Water storage tanks would not be included in this alternative.	Same as would occur for the proposed project / proposed action.	Same as would occur for the proposed project / proposed action.	No adverse effect on scenic vista; less than significant impact on substantially damaging scenic resources; no adverse effect on substantially degrading existing visual character and quality; less than significant impact on creating a new source of light or glare. Water storage tanks are visible in less than one percent of the viewshed and are consistent with other public infrastructure in the vicinity of Owens Lake. The temporary PVC pipe irrigation system would be barely visible and produce a source of glare below the level of significance.	No effect on scenic vista; less than significant impact on substantially damaging scenic resources; no adverse effect on substantially degrading existing visual character and quality; less than significant impact on creating a new source of light or glare. Water storage tanks would not be included in this alternative. The temporary PVC pipe irrigation system would be barely visible and produce a source of glare below the level of significance.	No effect on scenic vista; less than significant impact on substantially damaging scenic resources; no adverse effect on substantially degrading existing visual character and quality; less than significant impact on creating a new source of light or glare. Water storage tanks would not be included in this alternative. The temporary PVC pipe irrigation system would be barely visible and produce a source of glare below the level of significance.	No effect on visual resources would occur as the proposed project / proposed action would not be implemented. Existing impacts of dust on aesthetics would not be alleviated because DCMs would not be implemented.

TABLE 2.4-2
COMPARISON OF ALTERNATIVES, *CONTINUED*

Resource	Proposed Project / Proposed Action (194 acres) Water Truck / ATVs	Alternative 1 (214 acres) Water Trucks / ATVs	Alternative 2 (197 acres) Water Trucks /ATVs	Alternative 3 (194 acres) Water Trucks / Tanks PVC Irrigation System Selected Manual	Alternative 4 (194 acres) Water Trucks / Roadside PVC Irrigation System Selected Manual	Alternative 5 (194 acres) KCSD Water Well Pipeline PVC Irrigation System Selected Manual	Alternative 6 No Project / No Action
Air Quality	There will be an overall reduction in PM_{10} emissions as a result of the proposed project / proposed action. PM_{10} impacts due to construction would be less than significant and sensitive receptors would not be adversely affected by emissions. PM_{10} impacts during operation would be less than significant.	There will be an overall reduction in PM_{10} emissions as a result of Alternative 1. PM_{10} impacts due to construction would be less than significant and sensitive receptors would not be adversely affected by emissions. PM_{10} impacts during operation would be less than significant.	There will be an overall reduction in PM_{10} emissions as a result of Alternative 2. PM_{10} impacts due to construction would be less than significant and sensitive receptors would not be adversely affected by emissions. PM_{10} impacts during operation would be less than significant.	There will be an overall reduction in PM_{10} emissions as a result of Alternative 3. PM_{10} impacts due to construction would be less than significant and sensitive receptors would not be adversely affected by emissions. PM_{10} impacts during operation would be less than significant. There is an 80 percent reduction in ATV trips during operation than the proposed project / proposed action.	There will be an overall reduction in PM_{10} emissions as a result of Alternative 4. PM_{10} impacts due to construction would be less than significant and sensitive receptors would not be adversely affected by emissions. PM_{10} impacts during operation would be less than significant. There is an 80 percent reduction in ATV trips during operation than the proposed project / proposed action.	There will be an overall reduction in PM_{10} emissions as a result of Alternative 5. PM_{10} impacts due to construction would be less than significant and sensitive receptors would not be adversely affected by emissions. PM_{10} impacts during operation would be less than significant. There is an 80 percent reduction in ATV trips during operation than the proposed project / proposed action. No water trucks are required; thus, eliminating vehicle miles traveled for water trucks to and from the proposed project / proposed action site.	No effect on air quality; however, the No Project / No Action Alternative does not accomplish the proposed project / proposed action's goals and objectives for reducing PM_{10} emissions to meet NAAQS and California state standards.
Biological Resources	No effect on state-designated sensitive habitats; no expected impacts to rare, threatened, or endangered species pursuant to the Federal ESA and California ESA; no expected impacts to sensitive species designated as species of special concern by the CDFW or designated as sensitive species by the BLM; no expected impacts to locally important species; no expected impacts to federally protected wetlands pursuant to Section 404 of the CWA; no expected impacts to migratory routes or nursery sites; no expected impacts to local policies related to threatened or endangered species; no effect on an adopted Habitat Conservation Plan and/or Natural Community Conservation Plan.	Same as would occur for the proposed project / proposed action.	Same as would occur for the proposed project / proposed action.	Same as would occur for the proposed project / proposed action.	Same as would occur for the proposed project / proposed action.	Same as would occur for the proposed project / proposed action.	No effect on biological resources would occur as the proposed project / proposed action would not be implemented.
Cultural Resources	No adverse effect on culturally sensitive areas associated with historical resources; no expected impacts to archaeological resources; no adverse effect on paleontological resources; no adverse effect on sacred sites or human remains .	Same as would occur for the proposed project / proposed action	Same as would occur for the proposed project / proposed action	Same as would occur for the proposed project / proposed action.	Same as would occur for the proposed project / proposed action.	Same as would occur for the proposed project / proposed action.	Cultural resources would continue to be impacted as a result of the continued movement of the sand in the dunes

TABLE 2.4-2
COMPARISON OF ALTERNATIVES, *CONTINUED*

Resource	Proposed Project / Proposed Action (194 acres) Water Truck / ATVs	Alternative 1 (214 acres) Water Trucks / ATVs	Alternative 2 (197 acres) Water Trucks /ATVs	Alternative 3 (194 acres) Water Trucks / Tanks PVC Irrigation System Selected Manual	Alternative 4 (194 acres) Water Trucks / Roadside PVC Irrigation System Selected Manual	Alternative 5 (194 acres) KCSD Water Well Pipeline PVC Irrigation System Selected Manual	Alternative 6 No Project / No Action
Geology and Soils	No adverse effect related to surface fault rupture; no adverse effect from strong seismic ground shaking; no adverse effect from seismic related ground failure, including liquefaction; no adverse effect from seismically induced landslides; no adverse effect related to a substantial increase in soil erosion or loss of topsoil beyond that which occurs in the existing condition; no adverse effect related to the location of the proposed action on a geologic unit that is unstable or that would become unstable as a result of the proposed action.	Same as would occur for the proposed project / proposed action.	Same as would occur for the proposed project / proposed action.	Same as would occur for the proposed project / proposed action.	Same as would occur for the proposed project / proposed action.	Same as would occur for the proposed project / proposed action.	No effect on geology and soils would occur as the proposed project / proposed action would not be implemented.
Greenhouse Gases / Global Climate Change	GHG emissions resulting from construction and operation of the proposed action would be consistent with CEQ's guidance and would be below the level of significance.	Same as would occur for the proposed project / proposed action.	Same as would occur for the proposed project / proposed action.	Same as would occur for the proposed project / proposed action with an 80 percent reduction in ATV trips than the proposed project / proposed action.	Same as would occur for the proposed project / proposed action with an 80 percent reduction in ATV trips than the proposed project / proposed action.	Same as would occur for the proposed project / proposed action with an 80 percent reduction in ATV trips than the proposed project / proposed action, and the elimination of vehicle miles traveled for water trucks.	No effect on GHG and global climate change would occur as the proposed project / proposed action would not be implemented.
Hydrology	No adverse effect under CEQA and CEQ related to violation of water quality standards or waste discharge requirements during construction and operation; no adverse effect related to altering the existing drainage pattern of the site or project study area that would result in substantial erosion or siltation either off-site or on-site; no adverse effect to hydrology and water quality related to groundwater; no adverse effect to hydrology and water quality in relation to the 100-year flood zone; no impact related to in inundation by a seiche, tsunami, or mudflow.	Same as would occur for the proposed project / proposed action.	Same as would occur for the proposed project / proposed action.	Same as would occur for the proposed project / proposed action.	Same as would occur for the proposed project / proposed action.	Same as would occur for the proposed project / proposed action.	No effect on hydrology would occur as the proposed project / proposed action would not be implemented.
Land Use and Planning	No conflicts with applicable plans (FLPMA, Inyo County General Plan).	Same as would occur for the proposed project / proposed action.	Same as would occur for the proposed action.	Same as would occur for the proposed project / proposed action.	Same as would occur for the proposed project / proposed action.	Same as would occur for the proposed project / proposed action.	No effect on land use would occur as the proposed project / proposed action would not be developed.

TABLE 2.4-2
COMPARISON OF ALTERNATIVES, *CONTINUED*

Resource	Proposed Project / Proposed Action (194 acres) Water Truck / ATVs	Alternative 1 (214 acres) Water Trucks / ATVs	Alternative 2 (197 acres) Water Trucks /ATVs	Alternative 3 (194 acres) Water Trucks / Tanks PVC Irrigation System Selected Manual	Alternative 4 (194 acres) Water Trucks / Roadside PVC Irrigation System Selected Manual	Alternative 5 (194 acres) KCSD Water Well Pipeline PVC Irrigation System Selected Manual	Alternative 6 No Project / No Action
Recreation	No adverse effect on the use of existing neighborhoods and regional parks or other recreational facilities such that physical deterioration of the facility would occur or be accelerated; no effect on the construction or expansion of recreation facilities, which might have an adverse physical effect on the environment.	Same as would occur for the proposed project / proposed action.	Same as would occur for the proposed project / proposed action.	Same as would occur for the proposed project / proposed action.	Same as would occur for the proposed project / proposed action.	Same as would occur for the proposed project / proposed action.	No effect on recreation would occur as the proposed project / proposed action would not be developed.
Transportation and Traffic	No conflicts with applicable circulation plan, ordinance or policy; no impact with regard to an increase in traffic or level of service relative to an Inyo County threshold; no effect related to a change in air traffic patterns; potentially adverse effect due to turning vehicles or heavy trucks transporting materials to the site causing a possible safety hazard and potential damage to roadways from site-related equipment.	Same as would occur for the proposed project / proposed action.	Same as would occur for the proposed project / proposed action.	Same as would occur for the proposed project / proposed action with an 80 percent reduction in ATV trips than the proposed project / proposed action.	Same as would occur for the proposed project / proposed action with an 80 percent reduction in ATV trips than the proposed project / proposed action.	Same as would occur for the proposed project / proposed action with an 80 percent reduction in ATV trips than the proposed project / proposed action, and the elimination of vehicle miles traveled for water trucks.	No effect on transportation and circulation would occur as the proposed project / proposed action would not be developed.

Note: *Assumptions for calculations:

Given:
Number of bales – 123,185
Number of plants – 369,555

Assumed:
Tank on ATV trailer can safely haul ~150-200 gallons of water
Each ATV trip can water ~50 bales (apply ~3 gallons per bale)
Estimate of average mileage per ATV trip: ~1.0 +
Number of trips per day: ~5 (watering ~250 bales per day)

2.5 CEQA ENVIRONMENTALLY SUPERIOR ALTERNATIVE

CEQA requires that an environmentally superior alternative be selected among the alternatives analyzed in the EIR. When the No Project / No Action Alternative is the environmentally superior alternative, an EIR must also identify an environmentally superior alternative among the action alternatives (CEQA Guidelines Section 15126.6(e)(2)). In general, the environmentally superior alternative is defined as that alternative with the least adverse impacts to the project area and its surrounding environment.

The District has identified Alternative 5 as the environmentally superior alternative. Alternative 5 would meet the project objectives specified in Section 1.4.1, *District*. Alternative 5 would reduce the levels of windblown dust and attain the NAAQS and California State standard for particulate matter (PM_{10}) air pollution in the communities of Keeler and Swansea. Alternative 5 was developed with consideration of the resources located in the Keeler Dunes and is designed to avoid and/or minimize impacts to the maximum extent possible. Overall, Alternative 5 was identified as the environmentally superior alternative because it significantly reduces the vehicle miles traveled for the ATVs and eliminates the need for water trucks hauling water to the project, thus minimizing the amount of time required within the dunes and disturbance of the dunes in the vicinity of environmentally sensitive resources. Alternative 5 also removes the need to place three 20,000-gallon water tanks at the staging area, which was a concern articulated by the Native American representatives during the Section 106 Consultation. The end result of Alternative 5 would be a natural landscape similar to the Swansea Dunes, a comparable environment located to the north that is generally non-emissive, self-sustaining and maintained with minimal resources.

2.6 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

A variety of potential proposed project / proposed action alternatives were dropped from further consideration because they would not be capable of meeting most of the basic objectives of the proposed project / proposed action. The BACMs that were applied to the lake bed of Owens Lake would provide an effective means of controlling dust and achieving the NAAQS and California 24-hour standard for PM_{10} emissions. However, the source area for the emissions is characterized by sensitive cultural resources, the conservation of which is incompatible with gravel, shallow flooding, and managed vegetation. Each of the BACMs used at the bed of Owens Lake requires substantial ground disturbance that would be incompatible with the District's objectives for the proposed project / proposed action, which include conservation and management of the environmentally sensitive resources that characterize the site. Therefore, the District engaged in a process of exploring alternative methods for controlling emissions. DCMs that were evaluated and eliminated from detailed analysis included spreading of geotextile fabric overlain with gravel on emissive areas, excavation and removal of the sand dunes and spraying of emissive areas with water or other dust suppressing substances.[37]

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[37] Sapphos Environmental, Inc. November 2011. *Preliminary Constraints Analysis for the Keeler Dunes Dust Control Project*. Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA. Pasadena, CA.

2.6.1 GEOTEXTILE FABRIC AND GRAVEL

Placement of Geotextile Fabric over the Entire Keeler Dunes Area and Trucking In Gravel to Place on Top of the Fabric Up to 2 Inches Deep

This DCM would entail placing a permeable geotextile fabric over the entire Keeler Dunes area and covering the surface with 2 to 4 inches of gravel to control dust. This DCM would require geotextile fabric to cover up to approximately 200 acres of emissive deposits and between 53,000 and 106,000 cubic yards of gravel. Placing geotextile fabric over the entire proposed action site would be expected to result in significant impacts related to several resource issues. The aesthetics of the proposed project / proposed action site would be affected due to changes in the color and texture of the dune area. Temporary air quality impacts during gravel distribution could be minimized with mitigation measures. This alternative would have a significant impact related to biological resources due to loss of habitat. Cultural resources that occur in the area would be adversely affected by the implementation of the DCM. Also, recreational use of the project area would be restricted to protect the DCMs from damage. Due to these significant impacts, this DCM was eliminated from detailed analysis.

2.6.2 EXCAVATION AND REMOVAL

Excavation and Removal of Emissive Sand Deposits and Disposal

This DCM would entail removal of approximately 200 acres of emissive sand deposits at the Keeler Dunes by excavation and transportation to a disposal site. This alternative would utilize heavy construction equipment, such as backhoes, front loaders, and dump trucks, for removal of the sand deposits down to the underlying alluvial fan surface. The volume of the emissive deposits is approximately1.8 million cubic feet).[38] Removal of the emissive dune deposits would require extensive excavation activity over approximately 200 acres and would also necessitate the building of roadways to haul the material away. The emissive sand deposits would be removed down to the topographic surface of the Keeler alluvial fan where feasible. Removal of the sand deposits in the Keeler Dunes would result in significant impacts for several resource issues, particularly biological resources, specific cultural resources, and air quality. In addition, the effectiveness and feasibility of this alternative in removing all sand responsible for fugitive dust emissions at the proposed project / proposed action site is likely infeasible, and the alternative was eliminated from detailed analysis.

2.6.3 SPRAYING EMISSIVE SAND DEPOSITS

Spraying of the Entire Emissive Keeler Dunes Area through the Use of Irrigation Sprayers that Wet the Sand with Water or Another Dust-Suppression Substance Conveyed in a Water Solution

This DCM would entail spraying of the entire emissive Keeler Dunes area through irrigation sprayers that wet the sand with water or another water-based dust-suppression substance to control windblown dust, particularly during high wind events. Experience from implementation of sand-wetting DCMs at Owens Lake indicates that wetting would need to occur frequently to be effective

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[38] HydroBio, Advanced Remote Sensing. 20 January 2011. "Keeler Dunes Sand Volume: A LIDAR GIS Analysis." PowerPoint Presentation. Santa Fe, NM. Available at: http://www.gbuapcd.org/keelerdunes/presentations/SandVolumeAssessment.pdf

in reducing dust emissions to the PM_{10} standard. This alternative would maintain the dunes in their existing natural state, may increase the vegetative cover, and would provide some benefit toward slowing dune migration. Spraying would need to be conducted on a regular basis to be effective and would require a long-term water supply. Spraying water or other water-conveyed dust-control substance onto the sand deposits during high wind events would impact the aesthetics of the proposed project / proposed action area, which would be permanently changed due to the installation of an irrigation type system for spraying of water. These structures would be visible primarily to recreationalists using the dunes. Air quality impacts would occur during long-term maintenance of the irrigation system, resulting in numerous vehicle trips over the years of operation. A long-term source of water would be needed for this DCM, and a water supply-and-demand study would be required to define potential constraints related to water resources available in the area. The potentially greatest impacts would be to cultural resources that may be buried in the dunes area. The potentially frequent application of water may negatively alter cultural resources by physically and chemically damaging subsurface cultural deposits. Due to these potential impacts, this alternative was eliminated from detailed consideration.

2.7 INTENDED USES OF THE EIR/EA / AUTHORIZING ACTIONS

Due to the project's partial location on federal land, two agencies have jurisdiction. In order to meet the NAAQS in the OVPA, including the communities of Swansea and Keeler, the 2008 SIP requires that dust control measures be implemented in the Keeler Dunes.[39,40,41,42] Pursuant to the 2013 Agreement with the LADWP, the District has agreed to implement the specified dust control measures. The District serves as the Lead Agency pursuant to CEQA. The need for an ROW permit makes the BLM Lead Agency pursuant to NEPA. Although the BLM is a co-lead agency, the project will be implemented by the District.

2.7.1 DISCRETIONARY ACTIONS AND APPROVALS

The District is the lead state agency for the proposed project / proposed action. The District's Governing Board will consider certification of the EIR/EA and is authorized to render a decision on the proposed project / proposed action. Pursuant to CEQA, the proposed project / proposed action will require the following District actions.

2.7.1.1 CERTIFICATION OF THE FINAL EIR

After the required public review for the Draft EIR/EA, the District shall respond to written comments and produce a Final EIR/EA to be considered for certification by the District's Governing

[39] Calif. Health and Safety Code Section 40000. A finding from the Calif. Legislature that local authorities have the primary responsibility for control of air pollution from ALL sources, except motor vehicles

[40] CHSC 40001. Sub sec (a). District shall adopt and enforce rules and regulations to achieve and maintain state and federal air quality standards in ALL areas affected by emission sources under their jurisdiction. Sub sec (b). District regulations may provide for the prevention and abatement of air pollution episodes that cause discomfort or health risk or damage to the property of a significant number of persons

[41] CHSC 42450. The District board may, after notice and public hearing, issue an order for abatement whenever it finds any person...is in violation of...an order, rule or regulation prohibiting or limiting the discharge of air contaminants into the air.

[42] District Rule 401. A person shall take reasonable precautions to prevent visible particulate matter from being airborne, under normal wind conditions, beyond the property from which the emission originates.

Board. The District will consider approval of CEQA Findings pursuant to CEQA Guidelines Section 15091.

2.7.1.2 MITIGATION MONITORING AND REPORTING PROGRAM

The proposed project / proposed action and proposed project / proposed action alternatives that were carried forward for detailed analysis were designed to avoid significant impacts that would generate the need for mitigation.

2.7.1.3 BLM GRANT OF ROW

The portion of the proposed project / proposed action and proposed project / proposed action alternatives located on federal land would require ROW approval by the BLM to allow implementation of the DCMs.

2.7.2 DISCRETIONARY ACTIONS AND APPROVALS BY OTHER AGENCIES

Specific project elements may be subject to additional permits as described but not limited to in Table 2.7.2-1, *Permit Requirements*.

TABLE 2.7.2-1
PERMIT REQUIREMENTS

Agency	Permit	How to Obtain the Permit
Federal		
U.S. Department of the Interior, BLM	Temporary and permanent ROW grants on federal lands	The project proponent would be required to submit an application for Transportation and Utility Systems and Facilities on Federal Lands (Form 299) Plan of Activity to implement dust control measures on lands controlled by the BLM
Regional		
California RWQCB	Section 401 Water Quality Certification and Waste Discharge Requirements / Monitoring Reporting Plan	The project proponent would be required to submit a request for Water Quality Certification, and a SWPPP would have to be prepared
Caltrans	Encroachment	The project proponent would be required to submit an application for an encroachment permit from Caltrans District 9
County of Inyo	A permit for pumping of groundwater may be required	Groundwater extraction is regulated by the Water Department per the 1980 Groundwater Ordinance
Los Angeles Departement of Water and Power	Lease Agreement	The project proponent would be required to obtain a lease agreement from the LADWP.
Keeler Community Services District agreement to use well water	Well Water Use Agreement	The project proponent would be required to obtain permission from the KCSD to use well water for the project.

CHAPTER 3.0
ENVIRONMENTAL SETTING

3.1 AESTHETICS / VISUAL RESOURCES

This section provides a discussion of the existing visual resources in the vicinity of the proposed project / proposed action site that could potentially be affected by the construction and operation of the proposed project / proposed action and alternatives. This section references the Visual Resource Management Approach used by the BLM to evaluate key observation points (KOPs) (see Appendix B, *Visual Resources Technical Report*).[1,2,3]

3.1.1 REGULATORY FRAMEWORK

3.1.1.1 FEDERAL

A. Section 4(f) of the U.S. Department of Transportation Act of 1966

The U.S. Department of Transportation Act of 1966, Section 4(f), "Protection of Publicly Owned Park, Recreation Area, Wildlife or Waterfowl Refuge, or Land from Historic Sites," provides certain protections to publicly owned parks; recreation areas; wildlife and waterfowl refuges; and land from historic sites of national, state, or local significance. Section 4(f) requires that the federal agency must show that there are no feasible or prudent alternatives to the use of these areas.

B. Federal Land Policy and Management Act

The FLPMA of 1976 identifies scenic resources as one of the resources that the BLM must manage on public lands. The BLM's Visual Resource Management (VRM) policy establishes a visual assessment methodology to inventory and manage scenic values on public lands. The BLM manual M-8400 (VRM), Handbook H-8410 (Visual Resource Inventory [VRI]), and Handbook H-8431 (Visual Resource Contrast Rating [VRCR]) provide policies and procedures for determining visual resource values, establishing management objectives, and evaluating proposed actions for conformance with the objectives established by the BLM.

C. Visual Resource Inventory

The primary means to determine visual resource values is to conduct a VRI, as described in Manual H-8410-1 – Visual Resource Inventory (Manual H-8410-1). The VRI is a process to determine visual (scenic) values within the Field Office at a specific point in time. Visual Resource Inventory Classes provide the basis for considering visual values in the Resource Management Planning process and incorporate several factors including scenic quality, viewer sensitivity and viewing distance. They do not establish management direction but do provide a basis for analyzing impacts and developing mitigating measures for projects. They are considered the baseline data for existing conditions.

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[1] Bureau of Land Management. 1984. *Manual 8400 – Visual Resource Management* (VRM). Available at: http://www.blm.gov/nstc/VRM/8400.html

[2] Bureau of Land Management. 1986. *Manual H-8431 – Visual Resource Contrast Rating*. Available at: http://www.blm.gov/nstc/VRM/8431.html#Anchor-II-47857

[3] Bureau of Land Management. 1986. *Manual H-8410-1 – Visual Resource Inventory*. Available at: http://www.blm.gov/nstc/VRM/8410.html

Based on a scenic quality, sensitivity level, and distance zones, federal lands managed by the BLM are placed into one of four VRI classes that represent the relative value of the visual resources. There are four VRI classes (I to IV). These inventory classes represent the relative value of the visual resources. Classes I and II are the most valued, Class III represents a moderate value, and Class IV is of the least value for visual resources.

D. Visual Resources Management

The BLM determines VRM classes through analyses of multiple land uses and natural resources, including visual resources, for all BLM-administered lands through the RMP process. The VRM classes are a land use plan decision that guides future site-specific management actions for implementing the RMP. Boundaries of classes may be adjusted as necessary to reflect resource allocation decisions made in RMPs. For example, the BLM may assign an area with a VRI Class II designation a VRM Class IV designation, based on its overriding value for mineral resource extraction, or its designation as a utility corridor. Visual Resource Management Objectives that have been established for each class in Manual H-8410-1 (Table 3.1.1.1-1, *Visual Resource Management Objectives by Class*).

The BLM VRI and VRCR were based on an assessment of scenic quality, sensitivity, distance zones, and visual contrast ratings. The project area VRM classification is a Class III. The objective of Class III is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of casual observers. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape. KOPs were used to assess how the proposed project / proposed action would affect the VRM Class III Objectives.

TABLE 3.1.1.1-1
VISUAL RESOURCE MANAGEMENT OBJECTIVES BY CLASS

VRM Class	Objective
Class I	The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
Class II	The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
Class III	The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
Class IV	The objective of this class is to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

Source: Bureau of Land Management. 1986. Manual H-8410-1 – Visual Resource Inventory. Available at: http://www.blm.gov/nstc/VRM/8410.html.

E. Visual Contrast Rating

Manual H-8431 -Visual Resource Contrast Rating (Manual H-8431) (BLM, 1986b) states:

> The contrast rating system is a systematic process used by the Bureau of Land Management (BLM) to analyze potential visual impact of proposed projects and activities. . . . The basic philosophy underlying the system is: The degree to which a management activity affects the visual quality of a landscape depends on the visual contrast created between a project and the existing landscape. The contrast can be measured by comparing the project features with the major features in the existing landscape. The basic design elements of form, line, color, and texture are used to make this comparison and to describe the visual contrast created by the project. This assessment process provides a means for determining visual impacts and for identifying measures to mitigate these impacts.

The contrast rating system is not the only means of resolving potential visual impacts. Rather, it serves as a guide to ensure that potential visual impacts are minimized. The contrast rating is done from key observation points (KOPs), the most critical viewpoints in the project area where the view of a project would be the most revealing. These typically occur along commonly traveled routes or at other likely observation points. Factors considered in selecting KOPs from which the contrast rating is performed include angle of observation, number of viewers, length of time the project is in view, relative project size, season of use, and light conditions.

F. Bishop Resource Management Plan

The BLM is the predominant land owner in the Keeler Dunes area. The Keeler Dunes are located within the Owens Lake Management Area and South Inyo Management Area, two of nine management areas managed by the BLM pursuant to the Bishop Resource Management Plan.[4] The proposed DCMs would be implemented within the Owens Lake Management Area, with the exception of the KCSD well tank (Alternative 5), which is located within the South Inyo Management Area. The BLM's responsibilities include managing public land and associated natural resources to provide a variety of uses. The Bishop Resource Management Plan provides guidance and policies for managing BLM land within the nine management areas, including planning direction for the future use of 750,000 acres of public lands in the eastern Sierra region of Inyo and Mono counties. The management plan's policies and guidelines applicable to the Owens Lake Management Area address several key issues: preservation and protection of the environment; archaeological artifacts; wildlife habitat; and management of land tenure adjustment, domestic sources of minerals, off-highway vehicle use, grazing, recreation, and VRM Class III lands.

[4] U.S. Department of the Interior, Bureau of Land Management, Bakersfield District. 1993. *Bishop Resource Management Plan Record of Decision*. Bakersfield, CA.

3.1.1.2 STATE

A. California Department of Transportation, California Scenic Highway Program

The California Scenic Highway Program preserves and protects scenic highway corridors from changes that would diminish their aesthetic value. Caltrans designates scenic highway corridors and establishes those highways that are eligible for the program. The California Legislature created the Scenic Highway Program in 1963.[5] The California Streets and Highways Code includes a list of highways that are either designated or considered eligible for designation.

There are no officially designated State scenic highways within the vicinity of the proposed project / proposed action site. The nearest officially designated State scenic highways are the portion of SR 190 within Death Valley National Park, which is located approximately 16.7 miles southeast of the proposed project / proposed action site on the opposite side of the Inyo Mountain range; and the stretch of Interstate 395 from Fort Independence Indian Reservation north to the intersection of U.S. 395 and Fish Springs Road, which is located approximately 28.0 miles northwest of the proposed project / proposed action site. The California Scenic Highway Program identified SR 190 approximately 5.4 miles south of the proposed project / proposed action site and U.S. 395 approximately 7.0 miles west of the proposed project / proposed action site as eligible state scenic highways, which is distinct from an officially designated scenic highway.[6,7] An eligible state scenic highway becomes officially designated when the local governing body applies to Caltrans for scenic highway approval, adopts a Corridor Protection Program, and receives notification that the highway has been officially designated.[8]

The purpose of the Scenic Highway Program is to enhance and protect scenic resources along California highways in the following ways:

- Protect the scenic corridor from encroachment of incompatible land uses, such as junkyards, dumps, concrete plants, and gravel pits
- Mitigate activities within the corridor that detract from its scenic quality by proper siting, landscaping, or screening
- Prohibit billboards and regulate on-site signs so they do not detract from scenic views
- Make development more compatible with the environment and in harmony with the surroundings
- Regulate grading to prevent erosion, cause minimal alteration of existing contours, and preserve important vegetative features along the highway
- Preserve views of hillsides by minimizing development on steep slopes and along ridgelines

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[5] *California Streets and Highways Code*, Sections 260–284.

[6] California Department of Transportation. 4 February 2009. *The California Scenic Highway System*. Available at: http://www.dot.ca.gov/hq/LandArch/scenic_highways/index.htm

[7] California Department of Transportation. 14 October 2013. *California Scenic Highway Program: Eligible (E) and Officially Designated (OD) Routes*. Available at: http://www.dot.ca.gov/hq/LandArch/scenic/cahisys.htm

[8] California Department of Transportation. Accessed 12 July 2010. "Frequently Asked Questions." Available at: http://www.dot.ca.gov/hq/LandArch/scenic/faq.htm

- Prevent the need for noise barriers (sound walls) by requiring a minimum setback for residential development adjacent to a scenic highway[9]

3.1.1.3 LOCAL

A. Inyo County General Plan

The Inyo County General Plan provides goals and policies for the protection of scenic and visual resources namely in two elements: the Conservation and Open Space Element and the Circulation Element.

The Conservation and Open Space Element of the Inyo County General Plan provides goals and policies to protect the visual resources in Inyo County and contains a summary of the existing conditions in the planning area and major issues in regards to visual resources.[10]

The Conservation and Open Space Element also provides definitions for visual resources. The Conservation and Open Space Element defines a viewshed as the area that can be seen from a given vantage point and viewing direction. A viewshed is composed of foreground items (items closer to the viewer) that are seen in detail and background items (items at some distance from the viewer) that frame the view.[11] Relevant policies in the Inyo County General Plan include the following:

- <u>Policy VIS-1.1, Historic Character.</u> The County shall preserve and maintain the historic character of communities within the County.
- <u>Policy VIS-1.2, Community Design.</u> The County will encourage and assist in the establishment and maintenance of design themes within existing communities.
- <u>Policy VIS-1.3, Grading Impacts.</u> Man-made slopes should be treated to reflect natural hillside conditions in the surrounding area.
- <u>Policy VIS-1.4, Equipment Screening.</u> Within communities, building equipment shall be screened from public view.

The Circulation Element of the Inyo County General Plan also contains goals and policies related to scenic highways. The County contains three officially designated state scenic highways, two designated National Forest Scenic Byways, 63 miles of BLM National Scenic Byways, and 82 miles of BLM Backcountry Byways.[12] A scenic highway is defined as a highway or segment of a highway that has been designated as an official scenic highway by Inyo County and Caltrans. The following goal and policy from the Circulation Element are relevant to the proposed project / proposed action:[13]

- <u>Goal SH-1.</u> Maintain a system of scenic routes that will preserve and enhance the quality of life for present and future generations
- <u>Policy SH-1.1, Protect the Natural Qualities of Designated Scenic Routes.</u> The natural qualities of designated scenic routes should be protected.

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[9] California Department of Transportation. Accessed 12 July 2010. *The Benefits of Scenic Highway Designation*. Available at: http://www.dot.ca.gov/hq/LandArch/scenic/can_do.htm

[10] Inyo County Planning Department. December 2001. *Inyo County General Plan, Conservation and Open Space Element*. Independence, CA.

[11] Inyo County Planning Department. December 2001. *Inyo County General Plan*. Independence, CA.

[12] Inyo County Planning Department. December 2001. *Inyo County General Plan*. Independence, CA.

[13] Inyo County Planning Department. December 2001. *Inyo County General Plan*. Independence, CA.

The proposed project / proposed action site is not visible from any State Scenic Highway, National Forest Scenic Byway, BLM National Scenic Byway, or BLM Backcountry Byway afforded consideration in the Circulation Element of the Inyo County General Plan. The nearest National Scenic Byway is the portion of SR 190 within Death Valley National Park, which is located approximately 16.7 miles southeast of the proposed project / proposed action site on the opposite side of the Inyo Mountain range (please refer to Figure 3.1.2.2-1).[14]

3.1.2 AFFECTED ENVIRONMENT

The project area VRM classification is Class III.[15] The proposed project / proposed action site is located immediately north-northwest of the community of Keeler, California, and east of the 110-square-mile (70,000-acre) Owens Lake bed, located within the Owens Valley, Inyo County, California. The proposed project / proposed action includes the Keeler Dunes geologic feature, with the Owens Lake bed to the west, the nearby Inyo Mountain range to the east, the more distant Coso Mountain range to the south, and the Sierra Nevada range to the far west. The topographic relief of the proposed project / proposed action study area is 280 feet and extends from approximately 3,600 feet above MSL near the historic shore of Owens Lake to approximately 3,880 feet above MSL on the alluvial fan (Please refer to Figure 2.1.5.1-2, *Topographic Map with USGS 7.5-Minute Quadrangle Index*).

The proposed project / proposed action study area is characterized primarily by two plant communities dominated by two populations: Parry's saltbush (*Atriplex parryi*) and greasewood (*Sarcobatus vermiculatus*). The majority of the proposed project / proposed action study area is dominated by open dry areas with little or no vegetation present. It is adjacent to SR 136. The study area is surrounded by similar desert plant communities to the north, the community of Keeler to the southeast, and Owens Lake, with Managed Vegetation, Shallow Flooding, and Gravel Best Available Control Measures to the west (Figure 3.1.2-1, *Existing Conditions*).

Although the proposed project / proposed action site is uninhabited, the community of Keeler (population: 66) is located downwind and adjacent to the southeastern border of the site,[16] and the community of Swansea is located to the north. One designated Native American reservation, the Lone Pine Paiute-Shoshone Indian Reservation, is located approximately 10 miles to the northwest near the town of Lone Pine in the surrounding unincorporated area of Inyo County. The proposed project / proposed action is visible to residents of the community of Keeler who are known to use the Keeler Dunes for hiking, dog-walking, and other low-impact recreational activities.[17] The proposed project / proposed action site may also be visible to outside recreationalists, such as birders, hikers, and visitors to the historic mining/smelter sites of Swansea and Cerro Gordo, and as part of the viewshed from nearby recreational areas, such as the Lower Owens River Project (LORP) and Owens Lake dust control projects.

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[14] California Department of Transportation. n.d. *California Scenic Highway Program: Inyo County*. Available at: http://www.dot.ca.gov/hq/LandArch/scenic_highways/index.htm

[15] Bureau of Land Management, Bakersfield District. April 1993. *Bishop Resource Management Plan Record of Decision*. Bakersfield, CA.

[16] U.S. Census Bureau. 2010. *2010 Census*. Washington, DC.

[17] Sapphos Environmental, Inc. 12 July 2011. Memorandum for the Record No. 1. Subject: Summary of the June 29, 2011, Project Kickoff Meeting for the Keeler Dunes Environmental Impact Report / Environmental Impact Statement. Pasadena, CA.

G:\1064\1064-018\Documents\Technical Reports\Visibility

PHOTO 1

PHOTO 2

FIGURE 3.1.2-1
Existing Conditions

PHOTO 3

FIGURE 3.1.2-1
Existing Conditions

3.1.2.1 SCENIC VISTAS

There are no designated scenic vistas within the vicinity of the proposed project / proposed action. There are no scenic vistas designated in the Inyo County General Plan or the BLM Bishop Resource Management Plan near the proposed project / proposed action. The proposed project / proposed action is not visible from any scenic vista designated in the Inyo County General Plan or the BLM Bishop Resource Management Plan. In addition, the proposed project / proposed action is not designated as a park of national, state, or historic nature by any local, state or federal agency. The nearest designated recreational area to the proposed project / proposed action is Diaz Lake Recreation Area, approximately 9 miles northwest of the proposed project / proposed action; additionally, Inyo County intends to develop the delta leading into Owens Lake as a Delta Habitat Area for birding, with trails as near as 2 miles northwest of the proposed project / proposed action study area, under the Lower Owens River Recreation Plan.[18] Visual resources are a consideration for photographers in the area due to the scenic nature of the viewshed in the Owens Lake area.[19] There are no other national, state, local or historic parks within a 10-mile radius of the proposed project / proposed action.

The proposed project / proposed action site is composed of BLM-owned and administered lands and the LADWP-owned lands that are closed to off-road vehicle use. The area is not recognized as a scenic trail or recreational facility by any local, state, or federal agency.

3.1.2.2 SCENIC HIGHWAYS AND RESOURCES

The proposed project / proposed action site is not visible from any State scenic highway, National Forest Scenic Byway, BLM National Scenic Byway, or BLM Country Byway. Inyo County contains three officially designated state scenic highways, two designated National Forest Scenic Byways, 63 miles of BLM National Scenic Byways, and 82 miles of BLM Backcountry Byways (Figure 3.1.2.2-1, *Scenic Highways and Resources*). The nearest officially designated State scenic highway and National Scenic Byway is a 82-mile stretch of SR 190 located approximately 16.7 miles from the proposed project / proposed action site, near the entrance to Death Valley National Park on the opposite side of the Inyo Mountain range. The proposed project / proposed action site is not visible from that location.

3.1.2.3 VISUAL SENSITIVITY AND CHARACTER

Visual sensitivity is based on the activities of viewers from public areas near a particular site, which in this case is the proposed project / proposed action site. Areas surrounding the proposed project / proposed action site include two communities in the unincorporated area of Inyo County (the community of Keeler southeast and adjacent to the southern border of proposed project / proposed action and the community of Swansea to the north) and the town of Lone Pine and adjacent Lone Pine Paiute-Shoshone Indian Reservation, located northwest of the proposed project / proposed action site.

The existing proposed project / proposed action site is used by the residents of the nearby community of Keeler for recreational activities. Recreationalists and visitors to the historic mining/smelter sites of

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[18] Inyo County Water Department. January 15, 2013. *Draft Plan: Lower Owens River Recreation Use Plan*. PDF available online at: http://www.inyowater.org/LORP/DOCUMENTS/LowerOwensRiver_RecreationUsePlanDRAFT_011513.pdf Page 27 contains a map, *Preferred Recreation Concept*, for the recreation area.

[19] City of Los Angeles Department of Water and Power. August 2001. *Mitigated Negative Declaration Southern Zones Dust Control Project, Owens Lake Dust Mitigation Program, Owens Lake, California*. Prepared by: CH2M HILL, Santa Ana, CA.

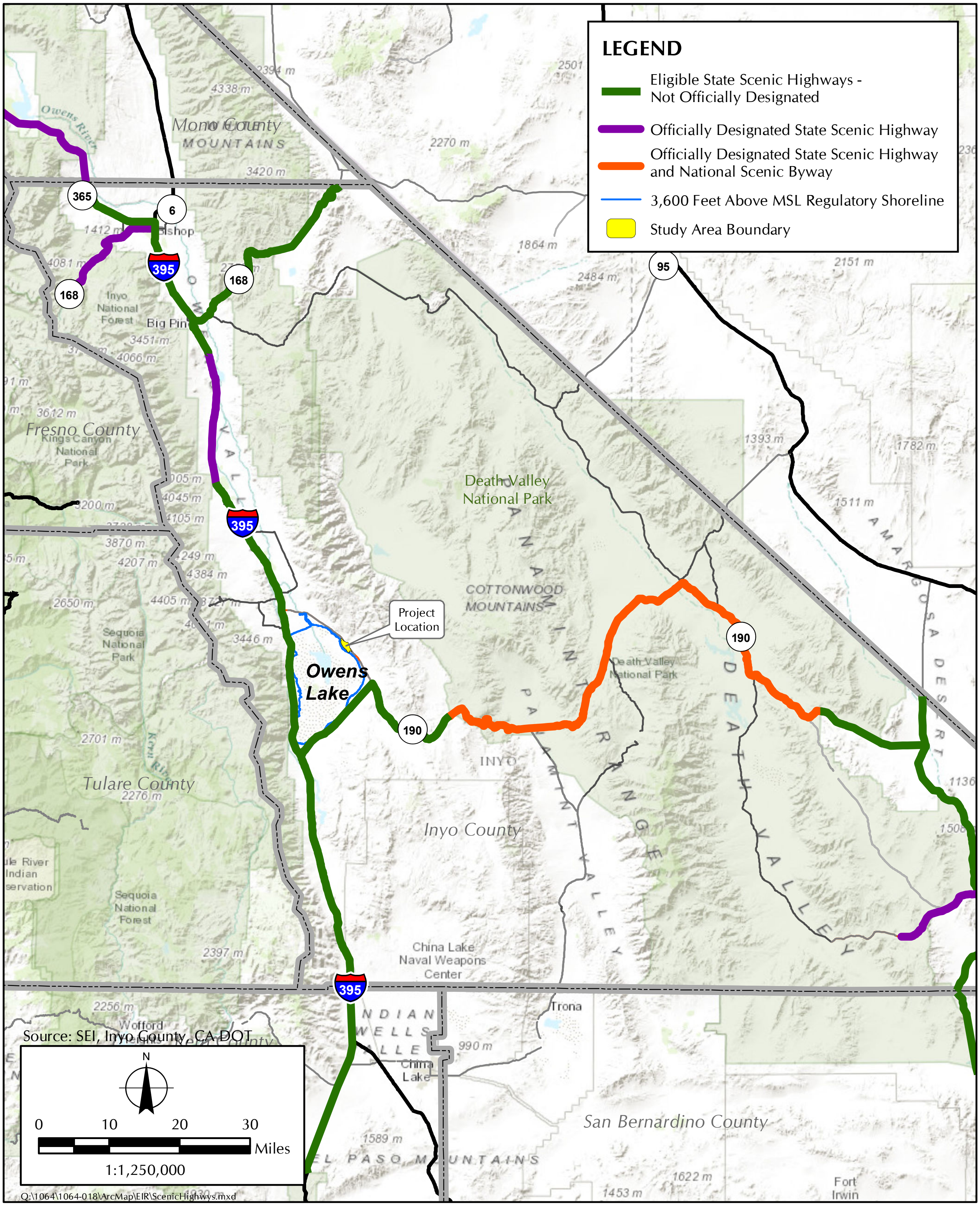

FIGURE 3.1.2.2-1

Scenic Highways and Resources

Swansea, Cerro Gordo, LORP, and the Owens Lake Dust Control Projects are able to view the proposed project / proposed action site.

The proposed project / proposed action lands are predominantly owned by the BLM, with small areas owned by LADWP and other landowners (please refer to Figure 2.1.5.1-1, *Study Area Location and Parcels Map*). The visual character of the study area is characterized by predominantly undeveloped, sparsely vegetated open space and the paved SR 136. Trucks, including watering trucks and double rigs, are frequently present on SR 136 and in the Owens Lake area. Vertical electrical transmission line poles pass through the proposed project / proposed action site on the western side of SR 136 from KOP 3 northwest past the proposed Staging Area 4. The Keeler Community Services District well is located less than 300 feet southeast of KOP 2 along the southeastern edge of the proposed project / proposed action site. Vegetation is low, sparse, simple, and indistinct under BLM definitions. The terrain in the study area and surrounding area can be characterized as a gradually sloped alluvial fan near the base of a mountain range along the edge of an expansive valley bottom containing low roads with shrubs, native vegetation, dunes, and the Owens Lake bed. To the west, the Owens Lake bed can be viewed in the middleground while the Sierra Nevada crest can be seen in the background. Colors in the proposed project / proposed action study area vary from the beige of the landform to green and tan of the vegetation to the blue, white, brown, and gray of the mountains. The visual character of the proposed project / proposed action study area is very representative of typical landscapes found in this area (Figure 3.1.2-1).

KOPs were located based on their usefulness in evaluating existing landscapes and potential impacts on visual resources with various levels of sensitivity, in different terrain, and from various vantage points. Visual simulations were prepared from KOPs that were selected[20] at the most critical viewpoints, as determined by the BLM office.[21] The observation points were chosen to represent typical views of the project property from various directions and to find potential areas of most viewer sensitivity. These KOPs were used to evaluate potential sensitive viewpoints, potential scenic resources, and recreational resources. These observation points represent the views from corridor users at SR 136 and the community of Keeler in the proposed project / proposed action vicinity. Geographic information system (GIS) coordinates of each existing condition photograph were recorded (Table 3.1.2.3-1, *Key Observation Points*; and Figure 3.1.2.3-1, *Key Observation Point Index Map*). Type, amount of use, and level of public access of KOPs are reflected in BLM Form 8400-6 (see Appendix C, *BLM 8400-6 Forms*, to the Visual Resources Technical Report [Appendix B to the EIR/EA]). Four KOPs were used for the analysis of scenic quality, visual contrast, and sensitivity.

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[20] Selection of the KOPs was coordinated with the BLM Bishop Field Office. All KOP locations were approved during the site visit and photo documentation occurred.

[21] Primosch, Lawrence R., Bureau of Land Management, Bishop Field Office, Bishop, CA. 24 April 2012. Proposed Project Site Visit with Grace Holder, Great Basin Unified Air Pollution District, Bishop, CA, and David Lee and Leanna Guillermo, Sapphos Environmental, Inc., Pasadena, CA.

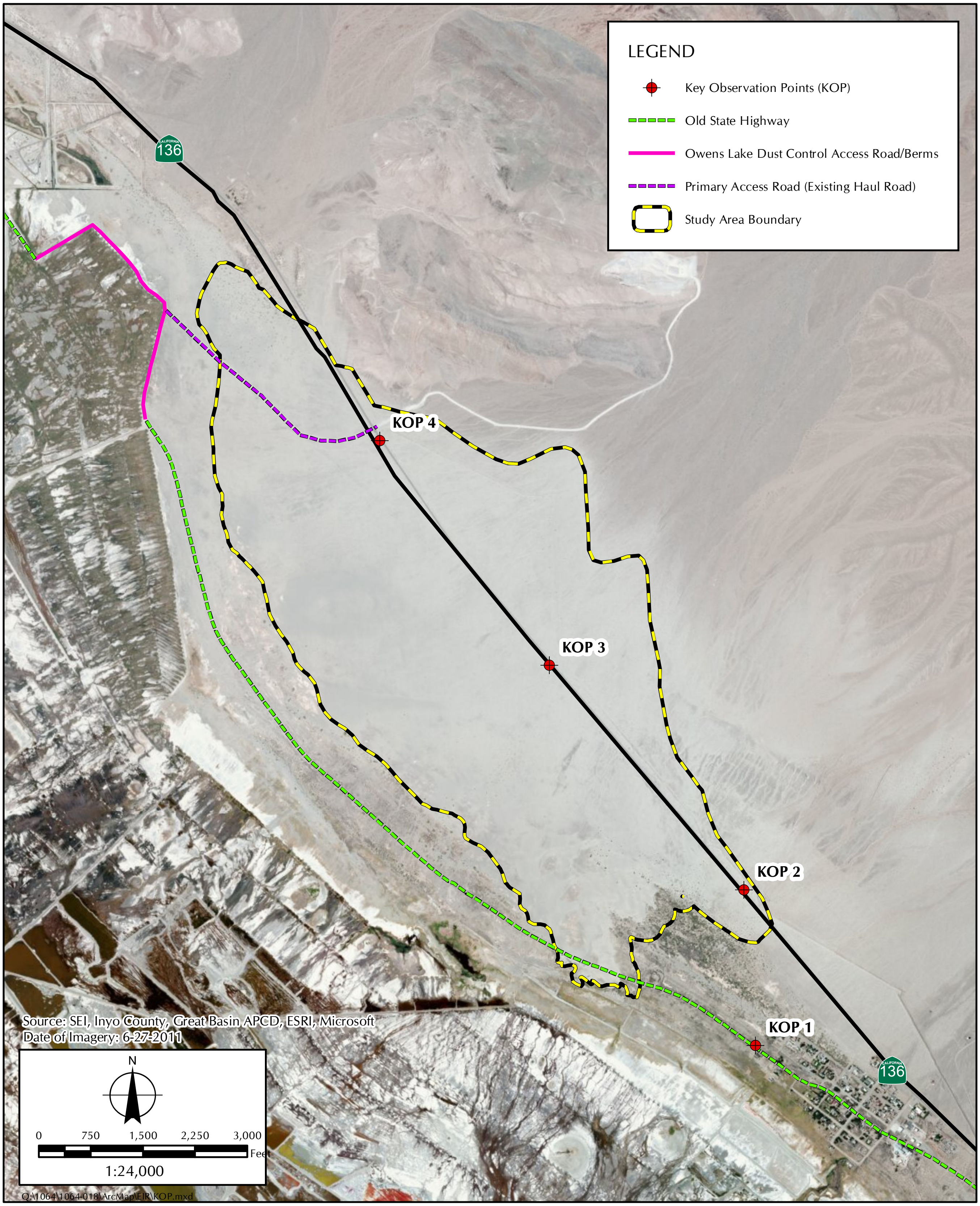

FIGURE 3.1.2.3-1

Key Observation Point Index Map

TABLE 3.1.2.3-1
KEY OBSERVATION POINTS

KOP ID	GIS Coordinate X	GIS Coordinate Y	Distance from Proposed Project / Proposed Action Area	Landscape Character
KOP 1	421321	4038764	0.5 mile (2,492 feet) southeast	A point KOP from the community of Keeler, representing a public gathering place, where the proposed project / proposed action would occupy the foreground
KOP 2	421270.7	4039446	0.2 mile (1,080 feet) east	A linear KOP along SR 136, representing a public road, where the proposed project / proposed action would occupy the foreground
KOP 3	420415.9	4040433	Within the proposed project / proposed action boundary	A point KOP from the LADWP scenic overlook, representing viewers on LADWP point of interest overlooks, where the proposed project / proposed action would occupy the foreground
KOP 4	419672	4041418	0.03 mile (164 feet) east	A linear KOP along SR 136, representing a public road, where the proposed project / proposed action would occupy the foreground

Key:
KOP = key observation point
GIS = geographic information system
LADWP = Los Angeles Department of Water and Power
Coordinate system: NAD 1983 UTM Zone 11 North

A. Existing Visual Setting

Photographs were taken at each KOP inventory location as part of the visual impact assessment process, to identify the existing visual setting. Visual resources surveys of the proposed project / proposed action property were conducted in order to understand the existing visual resources in the vicinity of the proposed project / proposed action. BLM protocol forms and worksheets were completed for the proposed project / proposed action to determine the level of contrast the proposed project / proposed action would have on the existing visual resources. Then, based on the classification of the visual resources for the proposed project / proposed action property, it was determined whether the visual resources management objectives for the proposed project / proposed action property were met.

An interdisciplinary team of visual resource management practitioners from Sapphos Environmental, Inc. conducted a collaborative analysis of the landscape's scenic quality using a quantitative method adapted from the BLM's VRM methodology. Photo documentation was conducted to document the existing conditions and provide a visual simulation of the proposed project / proposed action in operation from the three observation points. The KOPs have been analyzed as representations of the proposed project / proposed action area from potential areas of viewer sensitivity. Therefore, the ratings that are designated for the KOPs are also ratings designated for the proposed project / proposed action area.

Key Observation Point 1

This KOP provides a view toward the proposed project / proposed action area from the community of Keeler. This KOP illustrates little to no diversity in the landscape. Vegetation is low, sparse, simple, and indistinct under BLM definitions (Figure 3.1.2.3-2, *Observation Point 1*). The landform can be characterized as an expansive, relatively flat valley bottom. The foreground shows a low road, shrubs, native vegetation, dunes, and the Owens Lake bed. The Owens Lake bed can be viewed in the middleground, while the mountain ridgelines can be seen in the background.

Key Observation Point 2

This KOP provides a view from the paved SR 136. Vegetation is native, low, and simple in foreground. The dark grey, smooth, straight SR 136 can also be seen in the foreground. The landform is extremely coarse and relatively flat in the foreground, the Owens Lakebed in the middleground, and the Sierra Nevada ridgeline occupies the background (Figure 3.1.2.3-3, *Observation Point 2*). The features of this KOP are coarse, with colors varying from the beige of the landform, green and tan of the vegetation, and blue and brown of the mountains.

Key Observation Point 3

This KOP was taken at the LADWP overlook for the Owens Lake dust control project. The KOP illustrates flat land with minimal vertical relief in the foreground and middleground with the mountain ridgeline in the background (Figure 3.1.2.3-4, *Observation Point 3*). Vertical electrical transmission lines are located less than 150 feet northwest of KOP 3 and are visible in the foreground. The vegetation is low and scattered, consisting of native vegetation. The features of this KOP are coarse, with colors varying from the beige of the landform, green and tan of the vegetation, and blue and brown of the mountains. The Owens Lake bed can be seen in the middleground. This view is very representative of typical landscapes found in this area.

Key Observation Point 4

This KOP provides a view from a roadside turnout along the paved SR 136. The KOP illustrates the vast, relatively flat valley bottom in the foreground, the Owens Lake bed in the middle ground, and the mountain ridgeline in the background (Figure 3.1.2.3-5, *Observation Point 4*). Vertical electrical transmission line poles can be seen in the foreground, along with the coarse, scattered, native vegetation. The view depicts a beige landform, green and tan vegetation, and dark blue and brown mountains. This view is very representative of typical landscapes found in this area.

B. Visual Simulation

For the visual simulations, a Google Earth Keyhole Markup Language (KML) of the KOPs and control points was created. The proposed project / proposed action site was added to the Google Earth KML as a translucent red shading. Three images in Portable Document Format (PDF) were created that correspond to the camera angles for KOPs 2, 3, and 4 for the visibility simulation. Reference points were added to the PDFs and to the original photographs. The PDF and photographs were superimposed and transformed to align the reference points. The straw bales were then added to the corresponding areas proposed for mitigation. A viewshed analysis determined what portions of the proposed project / proposed action site were within a visible range from the combined viewsheds of four key observation points within and surrounding the proposed project / proposed action property.

PHOTO 1
Existing Conditions

FIGURE 3.1.2.3-2
Observation Point 1

PHOTO 1
Existing Conditions

PHOTO 2
Visual Simulation

FIGURE 3.1.2.3-3
Observation Point 2

PHOTO 1
Existing Conditions

PHOTO 2
Visual Simulation

FIGURE 3.1.2.3-4
Observation Point 3

PHOTO 1
Existing Conditions

PHOTO 2
Visual Simulation

FIGURE 3.1.2.3-5
Observation Point 4

The analysis includes a graphic representation of those areas of the proposed project / proposed action that would be visible from the combined viewsheds of the KOPs.

Key Observation Point 1

Under direction of the BLM Bishop Field Office, no visual simulation was created for this KOP due to the low visibility of the proposed project / proposed action components (straw bales) in the view.[22]

Key Observation Point 2

The proposed project / proposed action would be visible from this vantage point in the foreground as it is less than 2 miles from the vantage point (Figure 3.1.2-1). The existing vegetation is tan in color. With project implementation, the view from this point would have tan colored straw bales covering a portion of the previously beige valley bottom (Figure 3.1.2-1). From this view, as the straw bales and the vegetation are both tan in color and appear at the similar heights, the straw bales would be of the same height and color as the existing, native vegetation. In fact, the straw bales would appear intermixed, blend in, and be compatible in the view with the existing vegetation. The other infrastructure project elements (a temporary access route, temporary staging areas for equipment, and periodic water delivery trucks parked at Staging Areas 1, 2, and 3 along Old State Highway) and additional elements proposed in Alternatives 3, 4, and 5 (temporary irrigation lines, water storage tanks, and/or irrigation trunk lines) would be barely visible from this vantage point and would appear intermixed within the existing visual setting. The proposed project / proposed action components would be visible but mixed with the already existing vegetation in the foreground.

Key Observation Point 3

The visual simulation depicts the addition of the proposed project / proposed action features, with straw bales visible in horizontal lines within 2 miles of the vantage point (Figure 3.1.2.3-4). Therefore, the proposed project / proposed action components would be visible in the foreground. The existing vegetation is tan and green in color, with the tan similar to the tan in the straw bales. The vegetation is coarsely scattered throughout the proposed project / proposed action site and surrounding area. The straw bales that would be visible from this viewpoint are tan and coarse; which are similar to the color and characteristics of the existing vegetation. From this view, the straw bales would be the same height and blend in and be compatible with the color of the existing, native vegetation. The other infrastructure proposed project / proposed action elements (a temporary access route, temporary staging area for equipment, and periodic water delivery trucks parked at Staging Areas 1, 2, and 3 along Old State Highway) and additional elements proposed in Alternatives 3, 4, and 5 (temporary irrigation lines, water storage tanks, and irrigation trunk lines) would be barely visible from this KOP and would appear intermixed within the existing visual setting. The proposed project / proposed action components would be visible but mixed with the existing vegetation in the foreground.

Key Observation Point 4

The proposed project / proposed action would be visible from this vantage point in the foreground as it is less than 2 miles from the vantage point (Figure 3.1.2.3-5). The straw bales from the proposed project / proposed action are visible in the center-right side of the photograph. The straw bales are a

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[22] Primosch, Lawrence R., Bureau of Land Management, Bishop Field Office, Bishop, CA. 24 April 2012. Proposed Project Site Visit with Grace Holders, Great Basin Unified Air Pollution District, Bishop, CA, and David Lee and Leanna Guillermo, Sapphos Environmental, Inc., Pasadena, CA.

tan color and appear coarse in this vantage point. The existing vegetation is tan and green in color, with the tan similar to the tan in the straw bales. The vegetation is coarsely scattered throughout the proposed project / proposed action site and surrounding area. From this view, the straw bales would be of the same height and blend in and be compatible with the color of the existing, native vegetation. The other infrastructure proposed project / proposed action elements (a temporary access route, temporary staging area for equipment, and periodic water delivery trucks parked at Staging Areas 1, 2, and 3 along Old State Highway) and additional elements proposed in Alternatives 3, 4, and 5 (temporary irrigation lines, water storage tanks, and irrigation trunk lines) would be barely visible from this viewpoint and would appear intermixed within the existing visual setting. The proposed project / proposed action components would be visible but mixed with the already existing vegetation in the foreground.

Pilot Demonstration Test

In addition to the impact analysis conducted through visual simulation, the District is currently conducting a pilot study to validate the efficacy of using straw bales and native vegetation to stabilize the dune complex and reduce emissivity, as well as to provide site-specific information that will be utilized for the final design of the proposed project / proposed action. Figure 3.1.2.3-6, *Pilot Demonstration Test Photographs*, demonstrates the visibility of the test site.

3.1.2.4 LIGHT AND GLARE

There is no glare or light-emitting elements existing on the proposed project / proposed action site. Perceived glare is the unwanted and potentially objectionable sensation as observed by a person looking directly into the light source (e.g., the sun, the sun's reflection, automobile headlights, or other light fixtures). Reflective surfaces on existing buildings, car windshields, etc., can expose people and property to varying levels of glare. The salt and surface water at the adjacent Owens Lake bed are sources of light and glare in the vicinity of the proposed project / proposed action site.

Pilot Demonstration Test Site
Altitude: 1,101 meters
3,612 feet

FIGURE 3.1.2.3-6
Pilot Demonstration Test Photographs

Old State Highway Looking Northeast at Test Site
View of Pilot Demonstration Test Site from approximately 951 feet southwest of Test Site on Old State Highway, Altitude: 3,599 feet

FIGURE 3.1.2.3-6
Pilot Demonstration Test Photographs

Inyo Mountains Looking Southwest at Test Site
View of Pilot Demonstration Test Site from approximately 4,600 feet
northeast of Test Site on a ridge, Altitude: 4,278 feet

3.2 AIR QUALITY

Air quality in this section has been characterized from data provided by the Great Basin Unified Air Pollution Control District (District) and the Air Quality and Greenhouse Gas Emissions Technical Report prepared by Sapphos Environmental, Inc. The District maintains a monitoring network in the proposed project / proposed action study area composed of 16 sand motion monitoring sites.

3.2.1 REGULATORY FRAMEWORK

Responsibility for attaining and maintaining ambient air quality standards in California is divided between the California Air Resources Board (CARB) and regional air pollution control or air quality management districts. Areas of control for the regional districts are set by CARB, which divides the state into air basins. These air basins are based largely on topography that limits air flow access or by county boundaries. The proposed project / proposed action is located in Inyo County, California, within the District.

3.2.1.1 FEDERAL

A. Federal Clean Air Act

The Federal Clean Air Act (CAA) was enacted in 1970 to foster growth in the economy and industry while improving human health and the environment. The Federal CAA is the comprehensive federal law that regulates air emissions from stationary and mobile sources.

Among other things, the Federal CAA authorizes the U.S. Environmental Protection Agency (EPA) to establish National Ambient Air Quality Standards (NAAQS) to protect public health and public welfare and to regulate emissions of hazardous air pollutants. Existing national standards and state standards were considered in the evaluation of air quality impacts (Table 3.2.1.1-1, *Current [2013] Ambient Air Quality Standards*). The Federal CAA requires the U.S. EPA to routinely review and update the NAAQS in accordance with the latest available scientific evidence. For example, the 1-hour standard for O_3 was revoked in 2005 in favor of a new 8-hour standard intended to better protect public health.

B. National Ambient Air Quality Standards

The NAAQS were established by the U.S. EPA per the requirements of the Federal CAA. The NAAQS are used to identify thresholds for specific pollutants. Two types of air quality standards were established by the Federal CAA: (1) primary standards and (2) secondary standards. Primary standards define limits for the intention of protecting public health, which includes sensitive populations such as asthmatics, children, and the elderly. Secondary standards define limits to protect public welfare to include protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

There are seven federally regulated pollutants (ozone [O_3], nitrogen dioxide [NO_2], sulfur dioxide [SO_2], carbon monoxide [CO], lead [Pb], respirable particulate matter [PM_{10}], and fine particulate matter [$PM_{2.5}$]). On August 7, 1987, the U.S. EPA designated the southern Owens Valley (known as the Owens Valley Planning Area [OVPA]; see Figure 1.2-1, *Study Area Boundary in Relation to Owens Valley Planning Area*) as one of the areas in the nation that violated the new PM_{10} NAAQS. Subsequent air quality monitoring by the District has shown that the bed of Owens Lake (defined as the area below 3,600 feet above mean sea level [MSL]), most of which is owned by the State of California and managed by the California State Lands Commission (CSLC), is the major source of PM_{10} emissions contributing to air quality violations in the OVPA. Owens Lake is considered an anthropogenic (human-caused) source of PM_{10} because the City of Los Angeles's Aqueduct diverts water sources that historically supplied the lake. The 1990 Federal CAA sets the PM_{10} attainment deadline in "serious" non-attainment areas at the year 2005. In January 1993, the southern Owens Valley was reclassified as "serious non-attainment" for PM_{10}.

The U.S. EPA required the State of California to prepare a State Implementation Plan (SIP) for the OVPA that demonstrated how PM_{10} emissions would be decreased to prevent exceedances of the NAAQS. The District is the agency delegated by the State of California to fulfill this requirement. In accordance with Section 189(b) of the Federal CAA, an Attainment SIP that demonstrates conformance with the federal air quality standards through the implementation of a program of control measures was required to be submitted to the U.S. EPA by February 8, 1997. In November 1998, the District adopted the SIP, which was approved by the U.S. EPA on August 17, 1999. In 2003 and 2008, the District adopted revised SIPs requiring dust control measures, in addition to those from 1998, in the OVPA.

TABLE 3.2.1.1-1
CURRENT (2013) AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards [a]	National Standards [b]	
		Concentration	Primary [c]	Secondary[d]
Ozone (O_3)	1 Hour	0.09 ppm (180 μg/m³)	—	Same as Primary Standard
	8 Hour	0.070 ppm (137 μg/m³)	0.075 ppm (147 μg/m³)	
Respirable Particulate Matter (PM_{10})	24 Hour	50 μg/m³	150 μg/m³	Same as Primary Standard
	Annual Arithmetic Mean	20 μg/m³	—	
Fine Particulate Matter ($PM_{2.5}$)	24 Hour		35 μg/m³	Same as Primary Standard
	Annual Arithmetic Mean	12 μg/m³	12.0 μg/m³	
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m³)	35 ppm (40 mg/m³)	—
	8 Hour	9.0 ppm (10 mg/m³)	9 ppm (10 mg/m³)	—
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m³)	—	—
Nitrogen Dioxide (NO_2)	1 Hour	0.18 ppm (339 μg/m³)	100 ppb (188 μg/m³)	—
	Annual Arithmetic Mean	0.030 ppm (57 μg/m³)	0.053 ppm (100 μg/m³)	Same as Primary Standard
Sulfur Dioxide (SO_2)[e]	1 Hour	0.25 ppm (655 μg/m³)	75 ppb (196 μg/m³)	—
	3 Hour	—	—	0.5 ppm (1300μg/m³)
	24 Hour	0.04 ppm (105 μg/m³)	0.14 ppm (for certain areas)	—
	Annual Arithmetic Mean	—	0.030 ppm (for certain areas)	—

TABLE 3.2.1.1-1
CURRENT (2013) AMBIENT AIR QUALITY STANDARDS, *CONTINUED*

<table>
<tr><th>Pollutant</th><th>Averaging</th><th>California Standards [a]</th><th colspan="2">National Standards [b]</th></tr>
<tr><td rowspan="3">Lead[f]</td><td>30 Day Average</td><td>1.5 $\mu g/m^3$</td><td>—</td><td>—</td></tr>
<tr><td>Calendar Quarter</td><td>—</td><td>1.5 $\mu g/m^3$
(for certain areas)</td><td rowspan="2">Same as Primary Standard</td></tr>
<tr><td>Rolling 3-Month Average</td><td>—</td><td>0.15 $\mu g/m^3$</td></tr>
<tr><td>Visibility Reducing Particles</td><td>8 Hour</td><td>See footnote g</td><td colspan="2" rowspan="4">No National Standard</td></tr>
<tr><td>Sulfates</td><td>24 Hour</td><td>25 $\mu g/m^3$</td></tr>
<tr><td>Hydrogen Sulfide</td><td>1 Hour</td><td>0.03 ppm (42 $\mu g/m^3$)</td></tr>
<tr><td>Vinyl Chloride[f]</td><td>24 Hour</td><td>0.01 ppm (26 $\mu g/m^3$)</td></tr>
</table>

Notes:

a: California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM10, PM2.5, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

b: National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For $PM_{2.5}$, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current national policies.

c: National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

d: National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

e: The 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

f: The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

g: In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

Sources:

California Air Resources Board. Reviewed 24 November 2009. California Ambient Air Quality Standards (CAAQS). Available at: http://www.arb.ca.gov/research/aaqs/caaqs/caaqs.htm

California Air Resources Board. Updated 7 June 2012. Ambient Air Quality Standards. Available at: http://www.arb.ca.gov/research/aaqs/aaqs2.pdf

U.S. Environmental Protection Agency. Updated 14 July 2009. National Ambient Air Quality Standards (NAAQS). Available at: http://www.epa.gov/air/criteria.html

California Air Resources Board. Reviewed 24 November 2009. California Ambient Air Quality Standards (CAAQS). Available at: http://www.arb.ca.gov/research/aaqs/caaqs/caaqs.htm

C. General Conformity Rule

The U.S. EPA has authority over SIP general conformity in areas that do not meet federal air quality standards, and the federal land managers have review authority over any new projects that may affect federal Class I areas, as defined in 40 Code of Federal Regulations (CFR), Part 51.166; 40 CFR, Part 51, Subpart W; and 40 CFR, Part 93, Subpart B: General Conformity. These regulations ensure that federal actions conform to state and local plans for attainment. The District adopted these General Conformity requirements in District Regulation XIII and is delegated to enforce the federal regulations for projects that take place in the District. As federal lead agency, the Bureau of Land Management (BLM) must determine if the proposed project / proposed action requires a conformity determination. It is determined that this action does not require a conformity determination under District Rule 1303.c.4 because the implementation of dust control measures in the Keeler Dunes is required by the 2008 Owens Valley SIP and therefore would be in compliance with the federal General Conformity Rule.

D. Bureau of Land Management Bishop Resource Management Plan

The BLM is the predominant land owner in the Keeler Dunes area. The Keeler Dunes are located within the Owens Lake Management Area and South Inyo Management Area, two of nine management areas managed by the BLM pursuant to the Bishop Resource Management Plan (RMP).[1] The proposed DCMs would be implemented within the Owens Lake Management Area, with the exception of the KCSD well tank (Alternative 5), which is located within the South Inyo Management Area.

The RMP includes decisions that are presented in two parts: the area-wide decisions, which present management prescriptions valid throughout the entire Bishop Resource Area; and the decisions for individual management areas. Regarding air quality for the Owens Lake Management Area, the RMP specifies:

- Incorporate dust abatement measures in all discretionary actions.

The Bishop RMP includes the following standard operating procedures relevant to air quality:

- Avoid the use of soil disturbing equipment or vehicles on wet, poorly drained or erosive soils.
- Require soil layer separation and topsoil stockpiling for any activity that involves mechanical soil disturbance. Soil layers will be re-deposited and re-contoured to their natural configuration following project completion.
- Secure any necessary permits or clearances from state and local agencies relative to air quality requirements for projects that may impact air quality.

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[1] U.S. Department of the Interior, Bureau of Land Management, Bakersfield District. 1993. *Bishop Resource Management Plan Record of Decision*. Bakersfield, CA.

3.2.1.2 STATE

A. California Clean Air Act

The California CAA of 1988 requires all air pollution control districts in the state to endeavor to achieve and maintain state ambient air quality standards (Table 3.2.1.1-1) for O_3, CO, and NO_2 by the earliest practicable date and to develop plans and regulations specifying how they will meet this goal. There are no planning requirements for the state PM_{10} standard. The CARB, which became part of the California Environmental Protection Agency in 1991, is responsible for meeting state requirements of the Federal CAA, administrating the California CAA, and establishing the California Ambient Air Quality Standards (CAAQS). The California CAA, amended in 1992, requires all air districts in the state to endeavor to achieve and maintain the CAAQS. The CAAQS are generally stricter than national standards for the same pollutants, but there is no penalty for non-attainment. California has also established state standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles, for which there are no national standards.

3.2.1.3 REGIONAL

A. Great Basin Unified Air Pollution Control District Plans, Rules, and Regulations

The District has the responsibility to enforce federal, state, and local air quality regulations and to ensure that the federal and state air quality standards are met within the district. These standards are set to protect the health of sensitive individuals by restricting how much pollution is allowed in the air. To meet these standards the District aims to enforce those federal laws and state laws on stationary sources of pollution, and pass and enforce its own regulations as they become necessary for air quality issues.

For transportation conformity purpose and as required by District Rule 1231(e),[2] areas such as the OVPA, where construction-related fugitive PM_{10} is a contributor to the non-attainment problem, regional PM_{10} emissions analysis must consider construction-related fugitive PM_{10}, including emissions generated by new highway construction projects in the OVPA. Also, the level of construction activity, fugitive PM_{10} control measures in the SIP, and the dust-producing capacity of the proposed activities in the applicable implementation plan must also be included in the analysis.

General conformity requirements are contained in District Regulation XIII,[3] implementing section 176 (c) of the federal CAA, as amended (42 U.S.C. 7401 *et seq.*), and regulations under 40 CFR Part 51 Subpart W. This regulation requires that federal actions and federally funded projects conform to SIP rules and do not interfere with efforts to attain federal air quality standards.

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[2] Great Basin Unified Air Pollution Control District. Adopted 10 May 1994. Regulation XII--Conformity to State Implementation Plans of Transportation Plans, Programs, and Projects Developed, Funded or Approved under Title 23 U.S.C. or the Federal Transit Act, District Rule 1231(e) - Procedures for determining regional transportation-related emissions. Available at: http://www.arb.ca.gov/drdb/gbu/curhtml/reg-12.htm

[3] Great Basin Unified Air Pollution Control District. Adopted 10 May 1994. Regulation XIII - Conformity of General Federal Actions to State Implementation Plans. Available at: http://www.arb.ca.gov/drdb/gbu/curhtml/reg-13.htm

All fugitive dust sources are required to meet District Rule 400[4] and Rule 401,[5] which limit visible emissions to less than 20 percent opacity and require reasonable precautions to be taken to prevent visible emissions from leaving the proposed project / proposed action area. Reasonable precautions include, but are not limited to, water suppression, chemical stabilizers, windbreaks, and surface coverings. Fugitive dust sources such as vehicles on unpaved roadways, earthmoving, and gravel mining operations are affected by these District Rules.

3.2.1.4 LOCAL

A. Inyo County General Plan

The Inyo County General Plan contains policies related to air quality in its Safety element.[6] The goal of the Safety element is to foster compatible land use arrangements that contribute to reduced energy consumption and improved air quality. The Safety element contains a summary of the existing conditions in the planning area, major issues, and policies designed to aid Inyo County in achieving its goal. There are three policies in the Inyo County General Plan that are relevant to the proposed project / proposed action:

> Policy AQ-1.1: Regulations to Reduce PM_{10}. Support the implementation of the State Implementation Plan and the agreement between Great Basin Unified Air Pollution Control District and the City of Los Angeles Department of Water and Power.
>
> Policy AQ-1.2: Attainment Programs. Participate in the Great Basin Unified Air Pollution Control District's attainment programs.
>
> Policy AQ-1.3: Dust Suppression During Construction. Require dust-suppression measures for grading activities.

3.2.2 AFFECTED ENVIRONMENT

The proposed project / proposed action property is located in the Great Basin Valleys Air Basin (GBVAB), a 13,975-square-mile (9-million-acre) area encompassing Inyo County, Mono County, and Alpine County. The GBVAB is located in eastern California and is comprised of a single air district, the Great Basin Unified Air Pollution Control District (District).

The climate of the proposed project / proposed action site is characterized as a desert climate with hot summers; cold winters; infrequent rainfalls; moderate- to high-wind episodes; and low humidity. Average temperature and precipitation data have been recorded at the Independence Monitoring Station (Station Number 044232, located approximately 30 miles northwest of the proposed project / proposed action site at latitude 36° 48′ North, longitude 118° 11′ West). From 1893 to 2013, the annual maximum temperature was 75.2 degrees Fahrenheit (ºF), with an average maximum winter (December, January, and February) temperature of approximately 55.6ºF and an average maximum summer (June, July, and August) temperature of approximately 95.1ºF (Appendix C, *Air Quality and*

[4] Great Basin Unified Air Pollution Control District. Revised 18 January 1979. Rule 400 - Ringelmann Chart. Available at: http://www.District.org/rulesandregulations/PDF/Rule401.pdf

[5] Great Basin Unified Air Pollution Control District. Revised 4 December 2006. Rule 401 - Fugitive Dust. Available at: http://www.District.org/rulesandregulations/PDF/Rule401.pdf

[6] Inyo County Planning Department. December 2001. *Inyo County General Plan, Public Safety Element*. Independence, CA.

Greenhouse Gas Emissions Technical Report, *Appendix A*). Average minimum temperatures were recorded as approximately 28.9°F in winter and 61.6°F in summer. The average precipitation per year is approximately 5.21 inches, which occurs mostly during the winter, and relatively infrequently during the summer (Appendix A of AQTR). Precipitation averages approximately 1.00 inch per month during the winter (December, January, and February), approximately 0.28 inch per month during the spring (March, April, and May), approximately 0.33 inch per month during the fall (September, October, and November), and approximately 0.12 inch per month during the summer (June, July, and August; Appendix A). The average wind speed, as recorded at the Independence Monitoring Station from 2004 to 2013, was approximately 4.8 miles per hour (MPH) (Appendix A of AQTR).

The GBVAB contains many mountain ranges to the east of Sierra Nevada and west of the California-Nevada border. The mountain peaks on either side of the Owens Valley reach above 14,000 feet in elevation. The mountain ranges of the GBVAB form a barrier that protects much of California from extremely cold air from the east in winter. The Sierra Nevada to the west blocks the majority of cool, moist coastal air from entering the GBVAB from the west, so the GBVAB experiences infrequent rainfalls and prevalent low humidity.

3.2.2.1 APPLICABLE AIR QUALITY PLAN: 2008 OWENS VALLEY PM_{10} STATE IMPLEMENTATION PLAN

In 1974, Inyo County, Mono County, and Alpine County joined together in a joint powers agreement to form the District, which governs the GBVAB. The analysis of existing conditions related to air quality summarizes pollutant levels that exist prior to implementation of each component of the proposed project / proposed action.

The 2008 SIP requires that the OVPA (including the emissions from the Keeler Dunes) be in attainment of the federal PM_{10} NAAQS by March 2017, but due to delays in getting funding and in completing this EIR/EA, this deadline will not be achieved. Implementation of the proposed project / proposed action will reduce the PM_{10} emissions from the Keeler Dunes to levels below the federal and state 24-hour standards such that the communities of Keeler and Swansea would be in attainment by spring 2018. The District is responsible for developing and implementing a dust control strategy and plan for the Keeler Dunes PM_{10} emissions.

3.2.2.2 LOCAL AIR QUALITY

A. Emission Sources

The Keeler Dunes and associated sand deposits are a source of fugitive dust emissions that impact air quality in the communities of Keeler and Swansea. The proposed project / proposed action site is approximately 194 acres and is located adjacent to and east of the bed of historic Owens Lake between the communities of Keeler and Swansea. Dust concentrations measured within the community of Keeler from the Keeler Dunes continue to exceed the Federal and State PM_{10} 24-hour standards of 150 and 50 $\mu g/m^3$, respectively.[7] The number of exceedances of the Federal PM_{10} standard in the community of Keeler that are attributed to Owens Lake bed emissions has decreased with time,

[7] Kiddoo, Phill, Great Basin Unified Air Pollution Control District, Bishop, CA. 8 November 2013. Email to Adam Furman, Sapphos Environmental, Inc., Pasadena CA.

from as many as 16 per year in 1994 to just over 1 per year from 2006 to 2012.[8] This air quality improvement in Keeler is due to the implementation of dust control projects on the lake bed. However, the uncontrolled Keeler Dunes have continued to cause an average of six PM_{10} standard exceedances every year since 1993.[9] These standard exceedances threaten the health, property and environment of the residents of Keeler and Swansea.

B. Air Monitoring Stations

The District operates 15 air quality monitoring stations within the District boundaries. These stations are located in four planning areas (Coso Junction, OVPA, Mono Basin, and Mammoth Lakes) and in two of the District's three counties (Inyo and Mono) (Figure 3.2.2.2-1, *Great Basin Unified Air Pollution Control District Air Quality Monitoring Sites*).[10] Each of the 15 stations monitors PM_{10} concentrations, and only the Keeler station monitors $PM_{2.5}$ concentrations. Because the District is primarily rural, only the monitoring station at Mammoth Lakes reflects a more urban influence. Yearly concentrations of PM_{10} from 2009 through 2012 are summarized in Table 3.2.2.2-1 (*Summary of 2009–2012 PM_{10} Concentrations at the District's 15 Air Quality Monitoring Sites*). During this 4-year period, particulate levels exceeded the 24-hour Federal PM_{10} standard 307 times.[11] During windy conditions, dust from the beds of Mono Lake and Owens Lake produce extremely high PM_{10} concentrations, which reached 14,147$\mu g/m^3$ in over 24 hours in 2009. The highest concentrations from 2009 to 2012 occurred at the Keeler and Mono North Shore (north of the OVPA) monitoring stations. Annual average $PM_{2.5}$ concentrations at the Keeler monitoring site are low (maximum of 8.58 $\mu g/m^3$). Lizard Tail (4 kilometers north) and Keeler (1 kilometer south) are the closest PM monitor sites to the proposed project / proposed action site.

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[8] Great Basin Unified Air Pollution Control District. November 16, 2012. *Final Staff Report on the Origin and Development of the Keeler Dunes*. Bishop, CA.

[9] Great Basin Unified Air Pollution Control District. November 16, 2012. *Final Staff Report on the Origin and Development of the Keeler Dunes*. Bishop, CA.

[10] Kiddoo, Phill, Great Basin Unified Air Pollution Control District, Bishop, CA. 10 October 2012. Email to Makeba Pease, Sapphos Environmental, Inc., Pasadena CA.

[11] Kiddoo, Phill, Great Basin Unified Air Pollution Control District, Bishop, CA. 8 November 2013. Email to Adam Furman, Sapphos Environmental, Inc., Pasadena CA.

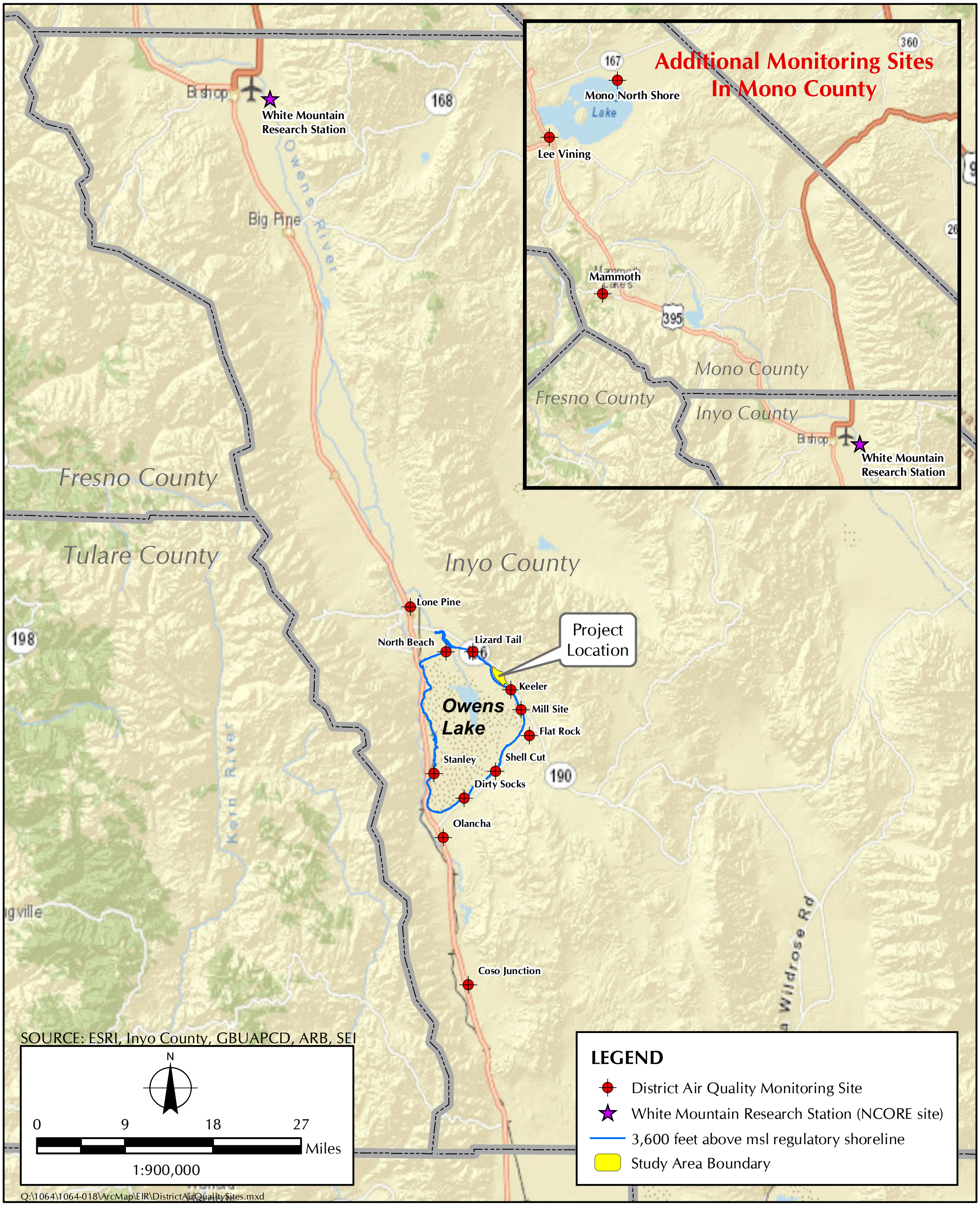

FIGURE 3.2.2.2-1

Great Basin Unified Air Pollution Control District
Air Quality Monitoring Sites

TABLE 3.2.2.2-1
SUMMARY OF 2009–2012 PM_{10} CONCENTRATIONS
AT THE DISTRICT'S 15 AIR QUALITY MONITORING Stations

Monitoring Site	PM_{10} ($\mu g/m^3$) Maximum 24-hr	PM_{10} NAAQS Exceedances
Coso Junction	219	5
Dirty Sox	1,437	33
Flat Rock	871	12
Keeler	13,380	31
Lee Vining	115	0
Lizard Tail	4,571	42
Lone Pine	264	3
Mammoth Lakes	128	0
Mill Site	754	7
Mono North Shore	14,147	81
North Beach	2,067	37
Olancha	779	16
Shell Cut	2,149	23
Stanley	1,507	12
White Mountain Research Station	626	5

Source: Kiddoo, Phill, Great Basin Unified Air Pollution Control District, Bishop, CA. 8 November 2013. Email to Adam Furman, Sapphos Environmental, Inc., Pasadena CA.

In addition to the air monitoring stations, the District also operates 16 sand motion monitoring sites within the proposed project / proposed action study area (see Figure 2.2.1-1, *Dust Control Measures and Minimum Efficiency Requirements*).

3.2.2.3 SENSITIVE RECEPTORS

Locations that can be considered sensitive receptors for air quality impacts include residences, schools, playgrounds, childcare centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes.[12] Sensitive individuals with compromised immune systems, such as children and the elderly, have the potential to be exposed to emissions from the construction-related activities associated with the vegetation of the proposed project / proposed action. The greatest potential for exposure of sensitive receptors to air contaminants would occur under strong wind events during the various stages of project construction, when minimal ground would be disturbed during grubbing and clearing and equipment would be used for site preparation, materials delivery, and planting.

The characterization of the baseline conditions included an identification of the sensitive receptors to be evaluated in conjunction with the consideration of criteria emissions during installation, maintenance, and monitoring of the proposed project / proposed action. The nearest sensitive receptors in the vicinity of the proposed project / proposed action located in the unincorporated area of Inyo County are the community of Swansea located north and adjacent to the proposed project / proposed action and the community of Keeler located southeast and adjacent to the proposed project / proposed action. One designated Native American reservation (Lone Pine Paiute-Shoshone Indian

[12] California Environmental Protection Agency, Air Resources Board, "Air Quality and Land Use Handbook: A Community Health Perspective"(March 29, 2005)

Reservation) and the town of Lone Pine are approximately 10 miles to the northwest (Figure 3.2.2.3-1, *Sensitive Receptors*).

3.2.2.4 ODORS

There have been no reports to the District or Inyo County of nuisance odor for the Keeler Dunes.[13,14]

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[13] Holder, Grace, Great Basin Unified Air Pollution Control District, Bishop, CA. 28 May 2013. Personal Communication to Adam Furman, Sapphos Environmental, Inc., Pasadena, CA.

[14] Long, Mark, Inyo County Environmental Health, Bishop, CA. 28 May 2013. Personal Communication to Adam Furman, Sapphos Environmental Inc., Pasadena, CA.

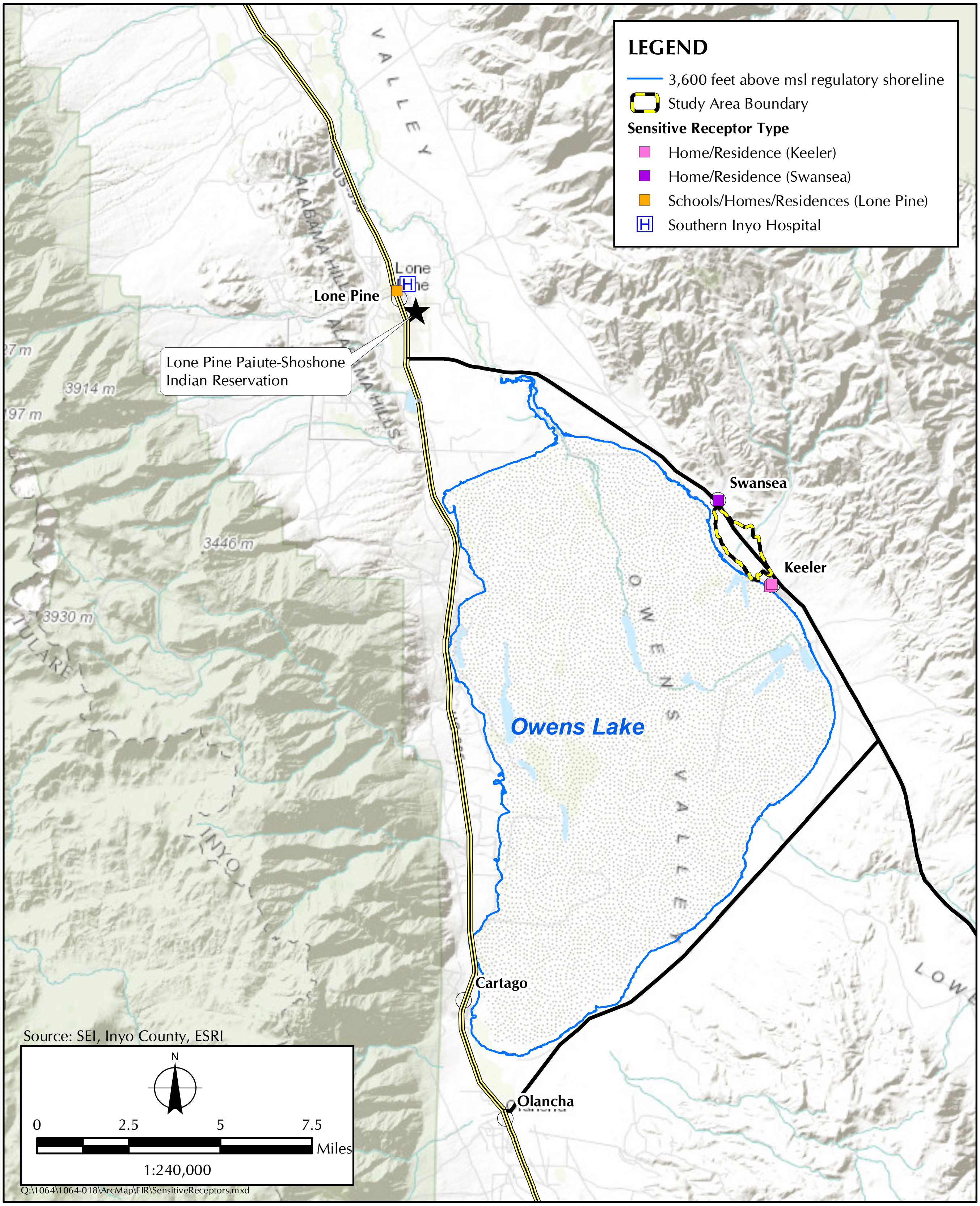

FIGURE 3.2.2.3-1

Sensitive Receptors

3.3 BIOLOGICAL RESOURCES

This section provides a background discussion of the regulatory framework and the affected environment. The regulatory framework discussion focuses on the federal, state, and local regulations. The affected environment discussion focuses on the plant communities and associated vegetation, general wildlife, riparian habitat and sensitive natural communities, special status species of plants and wildlife; jurisdictional waters, habitat connectivity and wildlife corridors, and the Bishop RMP area. Information contained in this section is summarized from the Keeler Dunes Dust Control Project Biological Resources Technical Report (Appendix D of this EIR/EA).

3.3.1 REGULATORY FRAMEWORK

3.3.1.1 FEDERAL

A. National Environmental Policy Act

The National Environmental Policy Act (NEPA) and its supporting federal regulations establish certain requirements that must be adhered to for any proposed action "financed, assisted, conducted, or approved by a federal agency." The BLM is the lead agency pursuant to NEPA for the lands that it administers in the proposed action area. The U.S. Army Corps of Engineers (USACOE) would be the lead agency pursuant to NEPA for that portion of the proposed action requiring the issuance of a nationwide or individual permit under Section 404 of the Clean Water Act. The proposed action area contains wetlands that are subject to USACOE jurisdiction.

B. Federal Endangered Species Act

Section 7(a)(2) of the ESA requires all federal agencies, including the USFWS, to evaluate the proposed project / proposed action with respect to any species proposed for listing or already listed as endangered or threatened and their critical habitat, if any is proposed or designated. Federal agencies must undertake programs for the conservation of endangered and threatened species and are prohibited from authorizing, funding, or carrying out any action that will jeopardize a listed species or destroy or modify its critical habitat. There are no plant or wildlife species listed under the ESA that are known or expected to be present with the study area.

C. Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 USC 668-668c), enacted in 1940 and as amended, prohibits anyone, without a permit issued by the USFWS, from "taking" bald and golden eagles, including their parts, nests, or eggs. The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." For purposes of these guidelines, "disturb" means: "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

D. Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) makes it unlawful to pursue, capture, kill, or possess or attempt to do the same to any migratory bird or part, nest, or egg of any such bird listed in wildlife protection treaties among the United States, Great Britain, Mexico, Japan, and the countries of the former Soviet Union. As with federal ESA, the MBTA authorizes the Secretary of the Interior to issue permits for incidental take. Nesting birds and the contents of the nest within the construction area of the proposed project / proposed action study area are protected pursuant to the MBTA.

E. Section 404 of the Federal Clean Water Act

The proposed project / proposed action does not involve any wetlands or other designated waters of the United States, nor does it involve any potential wetland designated on the National Wetlands Inventory (NWI). Wetlands designated on the NWI are present along the western border of the proposed project / proposed action study area but occur outside proposed project / proposed action impact areas.

F. BLM California

Survey Protocols for Special Status Plants. BLM-California has developed protocols for the survey (inventory) of special status plants that must be followed in order to comply with BLM policy, the National Environmental Policy Act (NEPA), and the Endangered Species Act (ESA).

G. Bishop Resource Management Plan

The BLM's responsibilities include managing public land and associated natural resources to provide a variety of uses. The Bishop Resource Management Plan (RMP) provides planning direction for the future use of land in the Bishop Resource Area.[1] The proposed project / proposed action study area is located within the Owens Lake Management Area and South Inyo Management Area, two of nine management areas managed by the BLM pursuant to the Bishop Resource Management Plan. The proposed dust-control measures would be implemented within the Owens Lake Management Area only. Policies relevant to the proposed project / proposed action include the following:

RMP Decision

Provide Yearlong Protection of endangered, threatened, candidate and sensitive plant and animal habitats. Yearlong Protection is defined in the RMP as: No discretionary actions which would adversely affect target resources would be allowed.

Wildlife

1. Consult with the California Department of Fish and Wildlife (CDFW) prior to design and accomplishment of wildlife habitat improvement projects.

2. Notify the CDFW one year in advance of any revegetation or vegetation manipulation projects.

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[1] U.S. Department of the Interior, Bureau of Land Management, Bakersfield District. April 1993. *Bishop Resource Management Plan Record of Decision*. Bakersfield, CA.

3. Manage candidate species, sensitive species and other species of management concern in a manner to avoid the need for listing as state or federal endangered or threatened species.

In addition, the Bishop Resource Management Plan has identified several goals and decisions that apply to the Owens Lake Management Area, which includes the Owens Lake bed and surrounding areas including the proposed project / proposed action study area west of Highway 136. The plan states the following Decisions:

- Maintain and enhance habitat for Owens pupfish, Owens tui chub, western snowy plover, Owens Valley vole and Owens sand dune snout beetle.

- Enhance wildlife habitat and watershed conditions with the following Desired Plant Community (DPC) prescriptions:

  - Meet DPC goals on 3,214 acres (75 percent) of total dune habitat to maintain habitat for the Owens sand dune snout beetle.

The DPC goal is as follows:

Desired Plant Community for Sand Dunes in the Owens Lake and South Inyo Management Areas.

- Desired plant community for stabilized and partially stabilized desert dunes along the periphery of Owens Lake: The goal is to insure adequate vegetative cover and microclimatic conditions for the Category 2 species *Trigonoscuta owensi*, Owens sand dune snout beetle. Dunes and sand accumulations would be maintained through retention of present vegetative cover which varies from scant cover of widely scattered shrubs and herbs to nearly closed shrub canopies. Plants which predominate in the dune areas and are primarily responsible for stabilization of dune hummocks are Parry's saltbush (*Atriplex parryi*), greasewood (*Sarcobatus vermiculatus*), and bush seepweed (*Suaeda moquinii*). Maintain the current overall vegetative cover of approximately 7 percent in the dune habitat.

3.3.1.2 STATE

A. California Endangered Species Act

The California ESA (CESA) prohibits the take of listed species except as otherwise provided in State law. Unlike the federal ESA, CESA applies the take prohibitions to species petitioned for listing (state candidates). State lead agencies are required to consult with CDFW to ensure that any actions undertaken by that lead agency are not likely to jeopardize the continued existence of any state-listed species or result in destruction or degradation of required habitat. CDFW is authorized to enter into memoranda of understanding with individuals, public agencies, universities, zoological gardens, and scientific or educational institutions to import, export, take, or possess listed species for scientific, educational, or management purposes. CESA was considered due to the potential presence of state-listed rare, threatened, or endangered species within the region of the proposed project study area. One species listed under CESA has been identified with the potential to occur near or within the proposed project study area.

B. State Fish and Game Code

The proposed project / proposed action does not involve any river, stream, lake, ephemerally flooded dry washes, or altered or artificial waterways that provide benefits to fish and wildlife resources. There is one active drainage in the proposed project / proposed action study area that brings water that is captured at the southern terminus of the diversion structures and directs it across the road and through a series of channels that cross through the Keeler Dunes. Neither the main active drainage nor its series of channels contain riparian habitat. Additionally, the drainage and channels occur outside proposed project / proposed action impact areas (Figure 3.3.1.2-1, *National Wetlands Inventory Map*).

Section 2080 and 2081 Threatened and Endangered Species

Section 2080 of the State Fish and Game Code (Code) states that "no person shall import into [California], export out of this state, or take, possess, purchase, or sell within this state, any species, or any part or product thereof, that the [State Fish and Game Commission] determines to be an endangered species or threatened species, or attempt any of those acts, except as otherwise provided in this chapter, the Native Plant Protection Act, or the California Desert Native Plants Act".

Under Section 2081 of the Code, the CDFW may authorize individuals or public agencies to import, export, take, or possess, any state-listed endangered, threatened, or candidate species. These otherwise prohibited acts may be authorized through permits or memoranda of understanding if (1) the take is incidental to an otherwise lawful activity, (2) impacts of the authorized take are minimized and fully mitigated, (3) the permit is consistent with any regulations adopted pursuant to any recovery plan for the species, and (4) the applicant ensures adequate funding to implement the measures required by CDFW. CDFW shall make this determination based on the best scientific and other information that is reasonably available and shall include consideration of the species' capability to survive and reproduce. Section 2081 of the State Fish and Game Code was considered due to the potential presence of state-listed rare, threatened, or endangered species within the region of the proposed project / proposed action study area. Several species listed under the California ESA have been identified with the potential to occur near or within the proposed project / proposed action study area.

Section 3503 and 3503.5 Resident and Migratory Birds

Sections 3503 and 3503.5 of the State Fish and Game Code provide regulatory protection to resident and migratory birds and all birds of prey within the state. These sections prohibit take of nests and eggs unless other provided for by the State Fish and Game Code.

C. Native Plant Protection Act

The Native Plant Protection Act includes measures to preserve, protect, and enhance rare and endangered native plants. The definitions of rare and endangered differ from those contained in CESA. However, the list of native plants afforded protection pursuant to the Native Plant Protection Act includes those listed as rare and endangered under CESA. The Native Plant Protection Act provides limitations on take as follows: "No person shall import into this state, or take, possess, or sell within this state" any rare or endangered native plant, except in compliance with provisions of the act. Individual land owners are required to notify the CDFW at least 10 days in advance of changing land uses to allow the CDFW to salvage any rare or endangered native plant material. The Native Plant Protection Act was considered in this analysis due to the potential presence of state-listed rare, threatened, or endangered plant species in the region of the proposed project / proposed action study

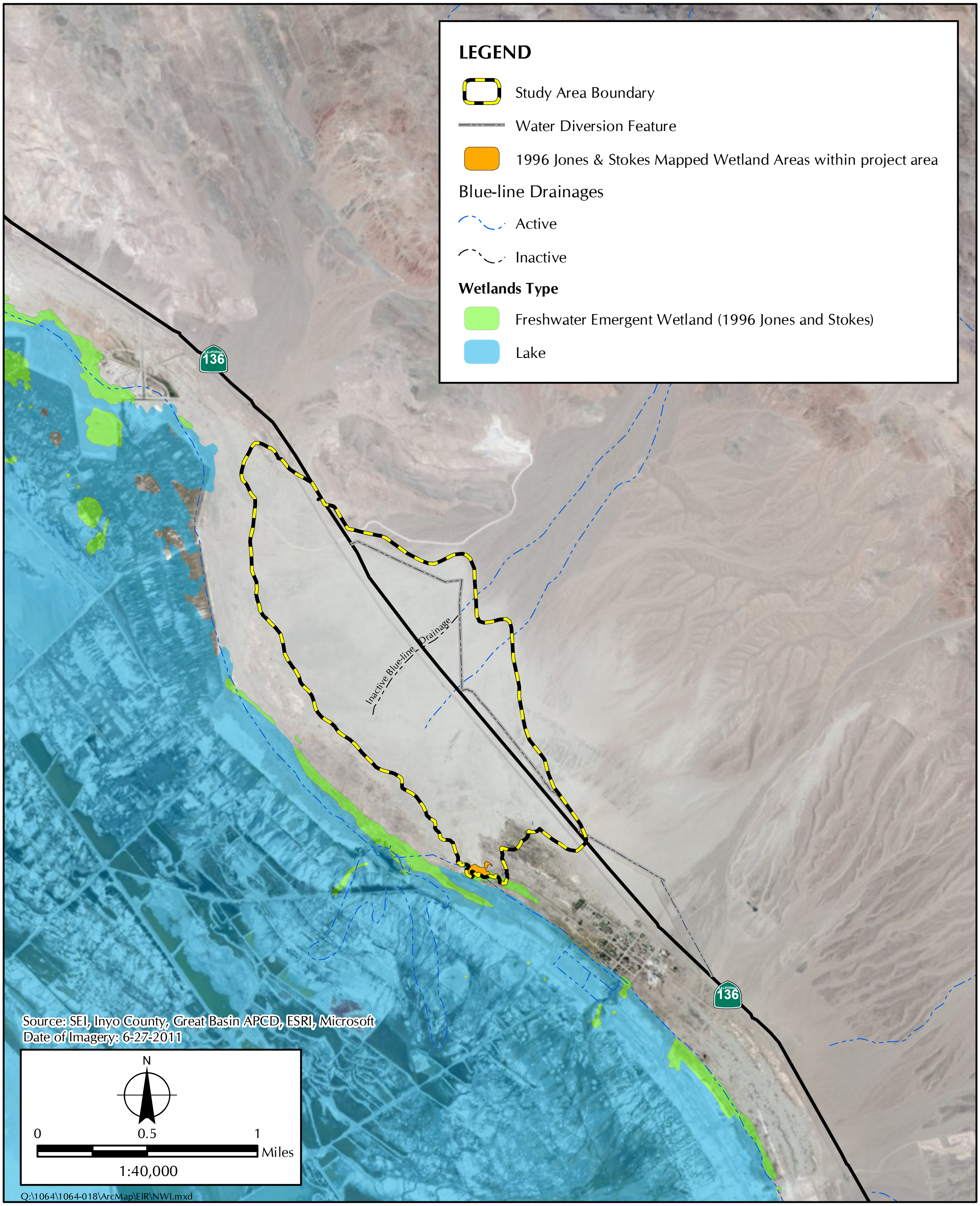

FIGURE 3.3.1.2-1

National Wetlands Inventory Map

area. Several species listed under the Native Plant Protection Act have been identified with the potential to occur near or within the proposed project / proposed action study area.

D. California Desert Native Plants Act

The California Desert Native Plants Act applies to the private and public lands that are not administered by the BLM, or any other Federal agency. The California Desert Native Plants Act was passed in 1981 to protect non-listed California desert native plants from unlawful harvesting on both publicly- and privately-owned lands. Harvest, transport, sale, or possession of specific native desert plants is prohibited unless a person has a valid permit, or wood receipt, and the required tags and seals.

3.3.1.3 REGIONAL

A. Inyo County General Plan

Conservation and Open Space Element

The Conservation and Open Space Element of the Inyo County General Plan contains policies related to biological resources.[2] The Conservation and Open Space Element contains a summary of the existing conditions in the planning area, major issues, and policies designed to aid the County to achieve its goals. The two goals identified by the County for biological resources include:

- **GOAL BIO-1.** Maintain and enhance biological diversity and healthy ecosystems in the county.

- **GOAL BIO-2**. Provide a balanced approach to resource protection and recreational use of the natural environment.

Biological resources policies relevant to the proposed project / proposed action include the following:

- **Policy BIO-1.1, Regulatory Compliance.** The County shall review development proposals to determine impacts to sensitive natural communities, of both local and regional concern, and special-status species. Appropriate mitigation measures will be incorporated into each project, as necessary.

- **Policy BIO-1.2, Preservation of Riparian Habitat and Wetlands.** Important riparian areas and wetlands, as identified by the County, shall be preserved and protected for biological resource value.

- **Policy BIO-1.3, Restoration of Biodiversity.** Encourage the restoration of degraded biological communities.

- **Policy BIO-1.4, Limitations for ERAs.** The County shall discourage development in Environmental Resource Areas (ERA).

[2] Inyo County Planning Department. December 2001. *Inyo County General Plan, Conservation and Open Space Element*. Independence, CA.

- **Policy BIO-1.5, Develop Outside of Habitat Areas.** Work with regulatory agencies and private developers to direct development into less significant habitat areas. Discourage urban development in areas containing sensitive natural communities or known to contain special-status species.

- **Policy BIO-1.6, Wildlife Corridors.** The County shall work to preserve and protect existing wildlife corridors where appropriate.

- **Policy BIO-1.7, Noxious Weeds.** Avoid activities that will promote the spread of noxious weeds in the County.

- **Policy BIO-1.8, Owens River Restoration.** The County will work with the LADWP and regulatory agencies to complete the restoration of habitat values along the historic Owens River channel as mitigation for degradation done with water export activities. This policy shall apply to the portion of the Owens River identified as the Lower Owens River Project.

- **Goal BIO-2.** Provide a balanced approach to resource protection and recreational use of the natural environment.

- **Policy BIO-2.1 Coordination on Management of Adjacent Lands.** Work with other government land management agencies to preserve and protect biological resources while maintaining the ability to utilize and enjoy the natural resources in the County.

- **Policy BIO-2.2 Appropriate Access for Recreation.** Work with other government land management agencies to preserve and protect biological resources while maintaining the ability to utilize and enjoy natural resources in the County.

3.3.2 STUDY METHODS

Information contained in this section is summarized from the *Keeler Dunes Dust Control Project Biological Resources Technical Report.*[3] The Biological Resources Technical Report (BRTR) is provided as Appendix D of this EIR/EA.

3.3.2.1 LITERATURE REVIEW

The literature review consisted of known ranges and habitat for the species, a query of the California Diversity Database (CNDDB), a review of the CNPS database, the BLM special status species list and species records from other sites in the vicinity.

Prior to conducting field surveys within the proposed project / proposed action site, a query of the CNDDB[4] and a review of the California Native Plant Society (CNPS) database were undertaken to identify special-status species, including listed, sensitive, and locally important species with the potential to occur within, and adjacent to, the proposed project / proposed action site. The query was

[3] Sapphos Environmental, Inc. 13 February 2013. *Keeler Dunes Dust Control Project Biological Resources Technical eport*. Pasadena, CA.

[4] California Department of Fish and Wildlife. 2005. *Rarefind 3: A Database Application for the Use of the California Department of Fish and Wildlife Natural Diversity Database*. Sacramento, CA.

conducted for the following nine U.S. Geological Survey (USGS) 7.5-minute series topographic quadrangles: Bartlett,[5] Dolomite,[6] Keeler,[7] Lone Pine,[8] Owens Lake,[9] Cerro Gordo Peak,[10] Olancha,[11] Vermillion Canyon,[12] and Centennial Canyon,[13] as well as an additional two surrounding 7.5-minute series topographic quadrangles, Union Wash[14] and Haiwee Reservoirs.[15] The typical CNDDB search included any quadrangle that is directly adjacent to the quadrangle that contains the proposed project / proposed action site. A preliminary analysis of sensitive species using 11 quadrants was pared down to potential considerations based on proximity and habitat constraints, producing 61 species (Appendix A of the BRTR, *Potential Sensitive Species*). Further consideration, based on the change in elevation of habitats in adjacent quadrangles when compared to the proposed project / proposed action site and while comparing each species' habitats to the characteristics present within the proposed project / proposed action site, produced the 27 more closely scrutinized candidates detailed within Section 5.0, *Result and Discussions*. Reviewed literature included the following: *Bishop Resource Management Plan Record of Decision*;[16] the Conservation and Open Space Element of the Inyo County General Plan;[17] previously completed environmental documentation, including field efforts conducted between April 2002 and May 2006 in preparation of the *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan*;[18] and *Rare Plant Survey Report Owens Dry Lake Dust Control Project Site*.[19]

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[5] U.S. Geological Survey. 1987. *7.5-Minute Series, Bartlett, California, Topographic Quadrangle*. Denver, CO.

[6] U.S. Geological Survey. 1987. *7.5-Minute Series, Dolomite, California, Topographic Quadrangle*. Denver, CO.

[7] U.S. Geological Survey. 1987. *7.5-Minute Series, Keeler, California, Topographic Quadrangle*. Denver, CO.

[8] U.S. Geological Survey. 1994. *7.5-Minute Series, Lone Pine, California, Topographic Quadrangle*. Denver, CO.

[9] U.S. Geological Survey. 1987. *7.5-Minute Series, Owens Lake, California, Topographic Quadrangle*. Denver, CO.

[10] U.S. Geological Survey. 1987. *7.5-Minute Series, Cerro Gordo Peak, California, Topographic Quadrangle*. Denver, CO.

[11] U.S. Geological Survey. 1987. *7.5-Minute Series, Olancha, California, Topographic Quadrangle*. Denver, CO.

[12] U.S. Geological Survey. 1987. *7.5-Minute Series, Vermillion Canyon, California, Topographic Quadrangle*. Denver, CO.

[13] U.S. Geological Survey. 1987. *7.5-Minute Series, Centennial Canyon, California, Topographic Quadrangle*. Denver, CO.

[14] U.S. Geological Survey. 1982. *7.5-Minute Series, Union Wash, California Topographic Quadrangle*. Denver, CO.

[15] U.S. Geological Survey. 1982. *7.5-Minute Series, Haiwee Reservoirs, California Topographic Quadrangle*. Denver, CO.

[16] Bureau of Land Management. 1993. *Bishop Resource Management Plan Record of Decision*. Bishop, CA.

[17] Inyo County Planning Department. December 2001. *Inyo County General Plan, Conservation and Open Space Element*. Independence, CA.

[18] Schade, Theodore D., et al. *2008 Owens Valley PM10 Planning Area Demonstration of Attainment State Implementation Plan*. Bishop, CA: Great Basin Unified Air Pollution Control District.

[19] City of Los Angeles Department of Water and Power. 2001. *Rare Plant Survey Report Owens Dry Lake Dust Control Project Sites*. Los Angeles, CA.

3.3.2.2 FIELD SURVEYS

The approximately 870.6-acre survey area encompasses the entire proposed project / proposed action study area. Approximately 780 acres are on lands managed by BLM, with the remaining approximately 66.7 acres being predominantly lands owned by the City of Los Angeles. Field surveys performed are described below.

A. General Biological Survey

Habitat assessments and general biological surveys of the proposed project / proposed action were undertaken by Sapphos Environmental, Inc. biologists. Survey dates for general biological surveys included April 12 and 13, 2011, June 6, 2012 and July 23, 2013. The purpose of these surveys was to document existing botanical resources, identify potential jurisdictional federal and state waters and wetlands and document suitable habitat for endangered, threatened, and sensitive species.

Surveys were conducted by a team of three biologists (one botanist, two wildlife biologists). During the field visits, observations and recordings of plant and wildlife species, as well as plant communities, were documented using a number of methods including, but not limited to: terrestrial photographs, aerial support photographs, and global positioning system (GPS) units. Habitat assessment was performed to document the presence or absence of habitat suitable to support special-status species and communities within the proposed project / proposed action site, as well as to provide a baseline description of existing biological resources. Permission was granted by the Los Angeles Department of Water and Power (LADWP) to access any areas within the study area that were under its jurisdiction, including potential areas depicted as wetlands on the National Wetlands Inventory (NWI) map (Figure 3.3.1.2-1). The limited size of the proposed project / proposed action site allowed for 100 percent of the area to be surveyed by foot.

B. Wetlands Survey

The determination regarding the potential presence or absence of federally protected wetlands were reviewed using topographic maps and NWI maps, interpretation of aerial photographs, spatial analysis using geographic information systems (GIS) software, and plant community mapping along with field analysis conducted concurrent with the habitat assessment. All potential wetlands identified on the National Wetlands Inventory (NWI) map were visited in the field to verify presence or absence, along with habitat functions and values (Figure 3.3.1.2-1). During ground-truthing, three essential criteria were looked for in evaluating the site for wetlands: (1) hydrophytic (wetland) vegetation; (2) hydric soils; and (3) wetlands hydrology, which is the presence of water at or above the soil surface for a sufficient period of the year to significantly influence the plant types and soils that occur in the area, where hydric soils have characteristics that indicate they were developed in conditions where soil oxygen was limited by the presence of saturated soil for long periods during the growing season.[20,21]

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[20] U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, U.S. Army Corps of Engineers, and U.S. Department of Agriculture Soil Conservation Service. 1989. *Federal Manual for Identifying and Delineating Jurisdictional Wetlands*. An Interagency Cooperative Publication. Washington, DC.

[21] U.S. Army Corps of Engineers. n.d. "Recognizing Wetlands – An Informational Pamphlet." Available at: http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits/techbio.aspx

C. Plant Community Survey

The evaluation of plant communities was undertaken in a two-phase effort consisting of a preliminary, data-driven field mapping effort on the CNPS rapid assessment protocol,[22] followed by verification and refinement of the field map in-house. The final plant community map was constructed on the field identification of regional assemblages of vegetation characterized by the presence of dominant plant species.[23] The vegetation assemblages described in this report follow a system used by the CDFW, the Sawyer and Keeler-Wolf classification,[24] rather than Holland classification.[25] The Sawyer and Keeler-Wolf classification focuses on floristics (i.e., the group of plant species occurring on a site) and dominance (i.e., which species are most abundant and which are less common) as the basis for their system.[26] Delineation of plant communities follows the current (2003) classification system of CDFW, the CNDDB of the State Resources Agency,[27] and was cross-referenced with Sawyer and Keeler-Wolf's *A Manual of California Vegetation*.[28] W here applicable, the plant community descriptions provided in *Preliminary Descriptions of the Terrestrial Natural Communities of California*[29] was used. Botanical names and common names used are according to *The Jepson Manual*.[30] Common names not available from *The Jepson Manual* are taken from Calflora.[31] Plant community surveys were completed in accordance with the CDFW protocol for special status plants[32]. The special status plant survey methods were reviewed by the BLM. The survey methods, in conjunction with the Special Status Plant Design Features, were determined to be adequate in regards to meeting the BLM Special Status Plant survey protocols.

If no plants were visible, the area was marked as barren. If plants were visible, the field crews walked to all patches and determined species composition and estimated abundance. During field surveys, 13 photo stations were selected at strategic points throughout the site. At each photo station, four pictures were taken (Appendix B of the BRTR, *Photo Station Pictures*), one in each cardinal direction (Appendix B of the BRTR; Figure 2.2-1, *Photo Stations Map*).

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[22] California Native Plant Society Vegetation Committee. September 2004. *California Native Plant Society Vegetation Rapid Assessment Protocol*. Sacramento, CA. Available at: http://www.cnps.org/cnps/vegetation/pdf/rapid_assessment_protocol.pdf

[23] Munz, Philip A., and D.D. Keck. 1949. "California Plant Communities." *El Aliso*, *2*(1): 87–105.

[24] Sawyer, J.O., and T. Keeler-Wolf. 1995. *A Manual of California Vegetation*. Sacramento: California Native Plant Society.

[25] Holland, R.F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California*. Sacramento, CA: California Department of Fish and Wildlife.

[26] Sawyer, J.O., and T. Keeler-Wolf. 1995. *A Manual of California Vegetation*. Sacramento, CA: California Native Plant Society.

[27] California Department of Fish and Wildlife, Wildlife and Habitat Data Analysis Branch. September 2003. *List of California Terrestrial Natural Communities Recognized by the California Natural Diversity Database*. Sacramento, CA. Available at: http://www.dfg.ca.gov/whdab/html/natural_communities.html

[28] Sawyer, J.O., and T. Keeler-Wolf. 2009. *A Manual of California Vegetation*. Sacramento, CA: California Native Plant Society.

[29] Holland, Robert F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California*. Sacramento, CA: California Department of Fish and Wildlife.

[30] Hickman, J.C., ed. 1993. *The Jepson Manual: Higher Plants of California*. Berkeley, CA: University of California Press.

[31] Calflora. n.d. Calflora Database. Available at: http://www.calflora.org. This database is continually updated, so it is an appropriate source of names for new species not described in *The Jepson Manual*.

[32] California Department of Fish and Wildlife. 2009. *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Communities*. Available at: http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/Protocols_for_Surveying_and_Evaluating_Impacts.pdf

D. Vertebrate Community

The limited size of the proposed project / proposed action site allowed for 100 percent of the area to be surveyed by foot and supported by driving accessible roads around the entire site during the early morning hours and late afternoon hours. Identification of wildlife species was aided by the use of photography, binoculars, and a spotting scope.

While conducting pedestrian surveys, biological survey crews assessed habitat for special-status species and relevant habitat was scrutinized for target species. Invertebrates and reptiles were searched for by visually inspecting the ground and turning over rocks, as well as searching under vegetation. A visual and auditory search was performed for birds. Mammals were surveyed by sight and investigation of diagnostic sign (i.e., track, scat, nests, and burrows). All wildlife species were identified to taxonomic level and compiled into a compendium (Appendix C of the BRTR, *Floral and Faunal Compendium*).

E. Invertebrates

To survey for insects, nonlethal pitfall traps were placed along several transects. Pitfall traps were checked in the morning, evening, and throughout the night to sufficiently sample insects during different activity periods. Pitfall traps (17 × 17 × 8 centimeters) were located in a grid across the dune area, replicating the various habitat types (BRTR; Figure 2.4-1, *Insect Sampling Locations*). Each trap was filled with a biodegradable, soapy water solution (< 1 percent soap), which breaks surface tension, so that insects remain in the traps. Twenty-six traps were located within the area. In addition, nocturnal surveys used light sampling, which often attracts species that would not be detected in pitfalls. One two-sided white sheet and light source (propane lantern) were set at a central location near the alkali flats, near trap #7. This light was set at dusk and remained until dawn, with periodic monitoring throughout the night.

Summer insect surveys were conducted May 3 to 4, 2011 and May 28 to 31, 2012. In addition, surveys were conducted for *Tescalsia giulianiata*, a winter moth, between January 7 and January 13, 2012. Due to the number of traps and breadth of area sampled, each monitoring of the pitfall traps took 4 to 5 hours to complete (a single transect was about 6 miles total linear distance). All traps were set between 2:00 p.m. and 7:00 p.m., sampled between 9:00 p.m. and 2:00 a.m., and sampled again between 6:00 a.m. and 11:00 a.m. All traps were removed and displaced sand was returned to the holes.

3.3.3 AFFECTED ENVIRONMENT

The affected environment addressed in this portion of the analysis includes the proposed project / proposed action study area, inclusive of the proposed project / proposed action and action alternatives

3.3.3.1 TOPOGRAPHY AND SOILS

The proposed project / proposed action study area is situated on the western portion of the Keeler alluvial fan that slopes from the Inyo Mountains on the east to the bed of Owens Lake on the west. The topographic relief of the proposed project / proposed action study area is 285 feet and extends from approximately 3,600 feet above mean sea level (MSL) near the historic shore of Owens Lake to approximately 3,885 feet above MSL on the alluvial fan. The location of the proposed project /

proposed action is depicted on U.S. Geological Survey (USGS) 7.5-minute series topographic quadrangles Owens Lake[33] and Dolomite.[34]

3.3.3.2 PLANT COMMUNITIES

A plant community is defined as a regional element of vegetation characterized by the presence of certain dominant species.[35] The plant communities described in this section are described in accordance with the definitions provided in Preliminary Descriptions of the Terrestrial Natural Communities of California and cross-referenced to the vegetation series described in A Manual of California Vegetation.[36,37]

Plant communities in the proposed project / proposed action biological survey area located west of SR136 were mapped in the field onto aerial imagery at a scale of 1 inch equals 24,000 feet. Preliminary plant community boundaries were plotted in the field. This preliminary plant community map was ground-proofed in the field by Sapphos Environmental, Inc. on April 12, 2011, and updated on June 6, 2011. The plant community within the surveyed area was placed on a map on a scale of 1 inch equals 24,000 feet (Figure 3.3.3.2-1, *Plant Community Map*). The acreage of plant communities on the proposed project / proposed action study area is summarized in Table 3.3.3.2-1, *Plant Communities Present within the Proposed Project / Proposed Action Study Area*.

[33] U.S. Geological Survey. 1987. *7.5-Minute Series, Owens Lake, California, Topographic Quadrangle*. Denver, CO.

[34] U.S. Geological Survey. 1987. *7.5-Minute Series, Dolomite, California, Topographic Quadrangle*. Denver, CO.

[35] Philip A. Munz, and D.D. Keck. 1949. "California Plant Communities." *El Aliso* 2(1): 87–105.

[36] Holland, Robert F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California*. Sacramento, CA.

[37] Sawyer, J.O., and T. Keeler-Wolf. 2009. *A Manual of California Vegetation*. 2nd Edition. Sacramento, CA: California Native Plant Society.

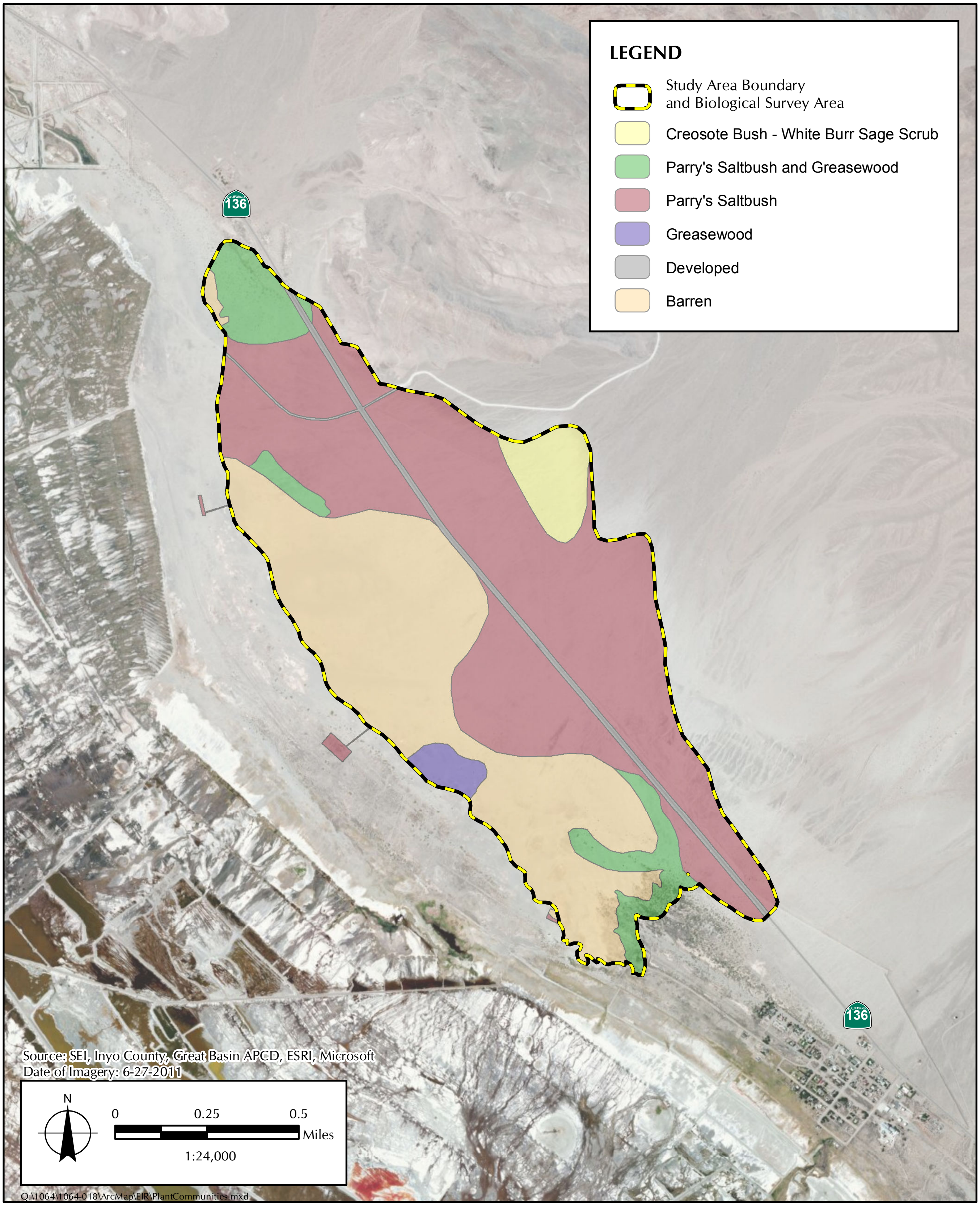

FIGURE 3.3.3.2-1

Plant Community Map

TABLE 3.3.3.2-1
PLANT COMMUNITIES PRESENT WITHIN THE PROPOSED PROJECT / PROPOSED ACTION STUDY AREA

Plant Community	Type	Element Code/Type	Current Status*	Acres (Percentage)
Shadscale scrub	Parry's Saltbush	California Natural Diversity Database Code 36.320.000	G4, S4	428 (49%)
	Parry's Saltbush and Greasewood	California Natural Diversity Database Code 36.320.000	G4, S4	12 (1%)
	Greasewood	California Natural Diversity Database Code 36.320.000	G4, S4	71 (8%)
Creosote Bush – White Burr Sage Scrub	N/A	California Natural Diversity Database Code 33.140.00	G5, S5	33 (4%)
Barren	N/A	N/A	N/A	306 (35%)
Developed	N/A	N/A	N/A	23 (3%)
			Total	873 (100%)

**Note:* Current Status:

Global Ranking: The *global rank* (G-rank) is a reflection of the overall condition of an element throughout its global range.

Species or Natural Community Level

G1 = Less than 6 viable element occurrences (EOs) OR less than 1,000 individuals OR less than 2,000 acres.

G2 = 6–20 EOs OR 1,000–3,000 individuals OR 2,000–10,000 acres.

G3 = 21–100 EOs OR 3,000–10,000 individuals OR 10,000–50,000 acres.

G4 = Apparently secure; this rank is clearly lower than G3 but factors exist to cause some concern; i.e., there is some threat, or somewhat narrow habitat.

G5 = Population or stand demonstrably secure to ineradicable due to being commonly found in the world.

State Ranking: The *state rank* (S-rank) is assigned much the same way as the global rank, except state ranks in California often also contain a threat designation attached to the S-rank.

S1 = Less than 6 EOs OR less than 1,000 individuals OR less than 2,000 acres
- S1.1 = very threatened
- S1.2 = threatened
- S1.3 = no current threats known

S2 = 6–20 EOs OR 1,000–3,000 individuals OR 2,000–10,000 acres
- S2.1 = very threatened
- S2.2 = threatened
- S2.3 = no current threats known

S3 = 21–100 EOs or 3,000–10,000 individuals OR 10,000–50,000 acres
- S3.1 = very threatened
- S3.2 = threatened
- S3.3 = no current threats known

S4 - Apparently secure within California; this rank is clearly lower than S3 but factors exist to cause some concern; i.e. there is some threat, or somewhat narrow habitat. NO THREAT RANK.

S5 - Demonstrably secure to ineradicable in California. NO THREAT RANK.

Source:

California Department of Fish and Wildlife. 2012. *California Natural Diversity Database, Rarefind 4*. Sacramento, CA.

Holland, Robert F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California*. Sacramento, CA: California Department of Fish and Wildlife.

Shadscale Scrub Plant Community. Parry's saltbush (*Atriplex parryi*) is the dominant species within the biological proposed action survey area. This Shadscale community type includes a few other species, such as greasewood (*Sarcobatus vermiculatus*) and bush seepweed (*Suaeda nigra*. This community corresponds to Sawyer and Keeler-Wolf's Shadscale series (CNDDB Code 36.320.00) and Holland's Shadscale scrub (Element Code: 36140). Shadscale scrub occurs on approximately 511 acres. Shadscale scrub dominated by Parry's saltbush accounts for approximately 428 acres and is located in a wide swath spanning the length of the study area. Shadscale scrub dominated by greasewood accounts for approximately 71 acres and one patch of the plant community is located near the middle of the study area along the southern boundary. Shadscale scrub co-dominated by Parry's saltbush and greasewood accounts for approximately 12 acres of the study area and is located in the northwest corner and southeast corner of the study area with an additional patch near the northwest corner.

Creosote Bush – White Burr Sage Scrub Plant Community. Creosote bush (*Larrea tridentata*) and white burr sage (*Ambrosia dumosa*) were the dominant species within this plant community. This Creosote Bush – White Burr Sage Scrub community type includes a few other species, such as desert holly (*Atriplex hymenelytra*) and cheesebush (*Ambrosia salsola*). This community corresponds to Sawyer and Keeler-Wolf's Creosote Bush – White Burr Sage Scrub series (CNDDB Code 33.140.00] and Holland's Mojave Creosote Bush Scrub (Element Code: 34100). Creosote Bush – White Burr Sage Scrub occurs on approximately 33 acres of the study area and is located near the middle of the study area along the northern boundary.

Barren. Barren aeolian sand deposits occur on approximately 306 acres and are located along the length of the southern boundary of the study area. Very few vascular plants grow in these areas.

Developed. Developed areas include existing dirt and paved roads within the study area. Developed areas generally lack vegetation and cover approximately 23 acres of the study area.

State-Designated Sensitive Plant Communities. The Shadscale scrub and Creosote Bush – White Burr Sage Scrub plant communities that are present within the proposed project / proposed action study area are not state-designated sensitive plant communities.

3.3.3.3 General Wildlife

A. Invertebrates

The survey area contains suitable habitat for several common species of invertebrates. Darkling beetles (*Eleodes spp*.), red harvester ants (*Pogonomyrmex rugosus*), pallid-winged grasshoppers (*Trimerotropis pallidipennis*) and nocturnal lepidopteron (moth) species were observed regularly by Sapphos Environmental, Inc. biologists during summer 2011 invertebrate surveys. Additional invertebrate species were observed on the study area much less frequently than the species listed above and can be found in the BRTR compendium (Appendix C of the BRTR).

B. Amphibians

Most amphibians require moisture for at least a portion of their life cycle, with many requiring a permanent water source for habitat and reproduction. Terrestrial amphibians have adapted to more arid conditions and are not completely dependent on a perennial or standing source of water. These species avoid desiccation by burrowing beneath the soil or leaf litter during the day and during the dry season. No amphibian species were observed in the study area during surveys conducted by Sapphos Environmental, Inc. in 2011, 2012, and 2013.

C. Reptiles

The diversity and abundance of reptile species varies with habitat type. Many reptiles are restricted to certain plant communities and soil types, although some of these species would also forage in adjacent communities. Zebra tailed lizard (*Callisaurus draconoides*), common side blotched lizard (*Uta stansburiana*), and western whiptail *(Aspidoscelis tigris*) were observed regularly by Sapphos Environmental, Inc. biologists during 2011-2013 biological surveys. Additional reptile species were observed on the study area much less frequently than the species listed above and can be found in the BRTR compendium (Appendix C of the BRTR).

D. Birds

The diversity of bird species varies with respect to the character, quality, and diversity of vegetation communities. Due to sparse vegetation and general lack of food sources for much of the habitat within the study area, bird diversity was relatively low. Mourning dove (*Zenaida macroura*), common raven (*Corvus corax*), horned lark (*Eremophila alpestris*), and white-crowned sparrow (*Zonotrichia leucophrys*) were regularly observed by Sapphos Environmental, Inc. biologists during 2011-2013 biological surveys. Additional bird species were observed on the study area much less frequently than the species listed above and can be found in the BRTR compendium (Appendix C of the BRTR).

E. Mammals

Black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), and white-tailed antelope squirrel (*Ammospermophilus leucurus*) were regularly observed in the study area through direct observation as well as burrows, tracks, and scat by Sapphos Environmental, Inc. biologists during 2011–2013 biological surveys. Additional mammal species were observed on the study area much less frequently than the species listed above and can be found in the BRTR compendium (Appendix C of the BRTR).

3.3.3.4 SENSITIVE BIOLOGICAL RESOURCES

A. Special Status Plant Species

The BLM uses the term "Special Status Plants" to include:

1. Federal Endangered, Threatened, and Proposed plants
2. BLM Sensitive plants

Sensitive plants are those species that are not federally listed as Endangered or Threatened or Proposed for federal listing, but which are designated by the BLM State Director for special management consideration. By national policy, Federal Candidate species are automatically treated as Sensitive. The California State Director has also conferred sensitive status on California State Endangered, Threatened, and Rare species on species with a California Rare Plant Rank of 1B (plants rare, threatened, and endangered in California and elsewhere) on the Special Vascular Plants, Bryophytes, and Lichens List maintained by the California Department of Fish and Wildlife[38] that are on BLM lands or affected by BLM actions and that are not already special status plants by virtue of being federally listed or proposed (unless specifically excluded by the State Director on a case-by-case basis), and on certain other plants the State Director believes meet the definition of Sensitive.

No special status plant species were observed on the biological proposed project / proposed action survey area in biological surveys conducted by Sapphos Environmental, Inc. biologists during 2011–2013

Federally Listed Species

As a result of the literature review, previously prepared reports, a query of the CNDDB for the topographic quadrangles for the proposed project / proposed action study area and vicinity, and consultation with experts on the area's biological resources, no federally listed threatened or endangered plant species were identified as having the potential to occur within the survey area. No federally listed threatened or endangered species were observed during biological surveys.

Directed surveys and habitat assessments were guided by information on the distribution, description, habitat requirements, and reproduction of listed plant species gathered from the following sources: CNDDB search,[39] and District's summary list of flora and fauna observed in the Keeler Dunes.

State-Listed Species

State-listed species are those species provided special legal protection under CESA. A state-listed endangered species is a species that is in danger of extinction throughout all or a significant portion of its range. A state-listed threatened species is one that is likely to become endangered in the absence of special protection or management efforts provided by the listing. A candidate species is one that is proposed by the state government for listing as endangered or threatened.

As a result of the literature review, previously prepared reports, a query of the CNDDB for the topographic quadrangles for the proposed project / proposed action study area and vicinity and consultation with experts on the area's biological resources, no state listed threatened or endangered plant species were identified as having the potential to occur within the survey area. No state listed threatened or endangered species were observed during biological surveys.

Directed surveys and habitat assessments were guided by information on the distribution, description, habitat requirements, and reproduction of listed plant species gathered from the following sources: CNDDB search,[40] and District's summary list of flora and fauna observed in the Keeler Dunes.[41]

BLM Sensitive Plant Species

Four species were determined to have the potential to occur within the proposed project / proposed action study area and were therefore targeted for directed surveys and habitat assessments: bald daisy

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[38] California Department of Fish and Wildlife Natural Diversity Database. January 2014. *Special Vascular Plants, Bryophytes, and Lichens List*. Sacramento, CA.

[39] California Department of Fish and Wildlife. 2012. *California Natural Diversity Database*. Sacramento, CA.

[40] California Department of Fish and Wildlife. 2012. *California Natural Diversity Database*. Sacramento, CA.

[41] Great Basin Unified Air Pollution Control District. 2011. *A Summary of the Flora and Fauna Observed in the Keeler Dunes between 11/2007 and 5/2011*. Bishop, CA.

(*Erigeron calvus*), Inyo County star-tulip (*Calochortus excavatus*), Sagebrush loeflingia (*Loeflingia squarrosa* var. *artemisiarum*) and Inyo phacelia (*Phacelia inyoensis*). Directed surveys and habitat assessments were guided by information on the distribution, description, habitat requirements, and reproduction of listed plant species gathered from a CNDDB search and the District's summary list of flora and fauna observed at the Keeler Dunes (Table 3.3.3.4-1, *BLM Sensitive Plant Species with the Potential to Occur in the Region of the Proposed Project / Proposed Action Study Area*).[42,43]

TABLE 3.3.3.4-1
BLM SENSITIVE PLANT SPECIES WITH THE POTENTIAL TO OCCUR IN THE REGION OF THE PROPOSED PROJECT / PROPOSED ACTION STUDY AREA

Species	Status	Habitat	Occurrence
Plants			
Creamy blazing star (*Mentzelia tridentata*)	CNPS 1B.3 BLM	Found in Mojavean desert scrub at elevation range of 2,297–3,806 feet	Not found during surveys on site. Habitat found in proposed action study area
Inyo County star-tulip (*Calochortus excavatus*)	CNPS 1B.1 BLM	Found among alkaline meadows in chenopod scrub at elevation range of 3,773–6,562 feet	Not found in 1995–1996, 1999, 2000, 2001, 2003–2004, 2007 surveys at Owens Lake bed. Not found during surveys on site. Habitat found in proposed project / proposed action study area
Sagebrush loeflingia (*Loeflingia squarrosa* var. *artemisiarum*)	CNPS 2.2, BLM	Associated with desert dunes, Great Basin scrub of Inyo County at elevation range of 2,297–5,331 feet blooms April to May	Not found in 1999, 2001, 2003, and 2004 surveys at Owens Lake bed; Not found during surveys on site. Habitat found in proposed project / proposed action study area
Sanicle cymopterus (*Cymopterus ripleyi* var. *saniculoides*)	CNPS 1B.2 BLM	Typically associated with Joshua tree woodland, Mojavean desert scrub of Inyo County at elevation range of 3,281-5,446feet	Observed among scrub habitat near Dirty Socks well, Owens Lake basin; Not found during surveys on site. Habitat found in proposed action study area

Note:
CNPS ranking system =
List 1B: Rare, threatened or endangered in California and elsewhere.
List 2: Plants is rare, threatened or endangered in California but more common elsewhere.
List 3: Plants about which we need more information.

Threat ranks:
0.1: Seriously threatened in California.
0.2: Fairly threatened in California.
0.3: Not very threatened in California.

Creamy Blazing Star. Annual herb. As a result of literature review, agency coordination, consultation with experts, and directed surveys undertaken during the flowering period, creamy blazing star was determined to be absent within the proposed project / proposed action study area. Creamy blazing star is designated as a CNPS List 1B.3 plant (rare, threatened, or endangered in California and elsewhere) and BLM sensitive species. Based on the review of the CNDDB, the closest occurrence of this species is located 27 miles south of the proposed project / proposed action boundary. As a result of the habitat

[42] California Department of Fish and Wildlife. 2012. *California Natural Diversity Database, Rarefind 4*. Sacramento, CA.

[43] Great Basin Unified Air Pollution Control District. 2011. *A Summary of the Flora and Fauna Observed in the Keeler Dunes Between 11/2007 and 5/2011*. Bishop, CA.

assessment and field surveys, habitat suitable to support creamy blazing star was identified but individuals were not found within the proposed project / proposed action.

Inyo County Star-Tulip. Perennial herb. As a result of literature review, agency coordination, consultation with experts, and directed surveys undertaken during the flowering period, Inyo County star-tulip was determined to be absent within the proposed project / proposed action study area. Inyo County star-tulip is designated as a CNPS List 1B.1 plant (rare, threatened, or endangered in California and elsewhere) and BLM sensitive species. Based on the review of the CNDDB, the closest occurrence of this species is located 9.4 miles northwest of the proposed project / proposed action boundary. As a result of the habitat assessment and field surveys, habitat suitable to support Inyo County star tulip was identified but individuals were not found within the proposed project / proposed action study area.

Sagebrush Loeflingia. Annual herb. As a result of literature review, agency coordination, consultation with experts, and directed surveys undertaken during the flowering period, sagebrush loeflingia was determined to be absent within the proposed project / proposed action study area. sagebrush loeflingia is designated as a CNPS List 2.2 plant (rare, threatened, or endangered in California and elsewhere) and BLM sensitive species. Based on the review of the CNDDB, the closest occurrence of this species is located 40 miles north of the proposed project / proposed action boundary. As a result of the habitat assessment and field surveys, habitat suitable to support sagebrush loeflingia was identified, but individuals were not found within the proposed project / proposed action.

Sanicle Cymopterus. Perennial herb. As a result of literature review, agency coordination, consultation with experts, and directed surveys undertaken during the flowering period, sanicle cymopterus was determined to be absent within the proposed project / proposed action study area. Sanicle cymopterus is designated as a CNPS List 1B.2 plant (rare, threatened, or endangered in California and elsewhere) and BLM sensitive species. Based on the review of the CNDDB, the closest occurrence of this species is located 17 miles south of the proposed project / proposed action boundary. As a result of the habitat assessment and field surveys, habitat suitable to support sanicle cymopterus was identified, but individuals were not found within the proposed project / proposed action.

Priority Plant Species

Priority plant species are rare, unusual, or key species that are not identified as sensitive by BLM or listed as threatened or endangered. Priority plant species are specifically plants that are included on the CNPS Lists 2–4 (Table 3.3.3.4-2, *Priority Plant Species with the Potential to Occur in the Region of the Proposed Project / Proposed Action Study Area*).

TABLE 3.3.3.4-2
PRIORITY PLANT SPECIES WITH THE POTENTIAL TO OCCUR IN THE REGION OF THE PROPOSED PROJECT / PROPOSED ACTION STUDY AREA

Species	Status	Habitat	Occurrence
Plants			
Booth's evening primrose (*Camissonia boothii* ssp. *boothii*)	CNPS 2.3	Typically associated with Joshua tree woodland and Pinyon and Juniper woodland; observed among stabilized dunes at Owens Lake basin at elevation range of 2,953–7,874 feet; blooms April to September	Not found during surveys on site. Habitat found in proposed project / proposed action study area
Lincoln's rock cress (*Boechera lincolnensis*)	CNPS 2.3	Found on limestone among Chenopod scrub, Mohavean desert scrub in Inyo County at elevation range of 3,610–6,810 feet	Not found during 1995–1996, 1999–2001, and 2003 surveys at Owens Lake bed; Not found during surveys on site. Habitat found in proposed project / proposed action study area
Naked milk-vetch (*Astragalus serenoi* var. *shockleyi*)	CNPS 2.2	Chenopod scrub, Great Basin scrub, Pinyon and Juniper woodland; dry, alkaline soils; found on course granitic alluvium among Chenopod scrub, Great Basin scrub at elevation range of 4,921–7,382feet	Not found during 1995–1996, 1999–2001, and 2003 surveys on sites over Owens Lake bed; Not found during surveys on site. Habitat found in proposed project / proposed action study area
Nevada oryctes (*Oryctes nevadensis*)	CNPS 2.1	Found in dry, sandy soil in washes and open scrub habitat in the Owens Valley at elevation range of 3,609–8,366 feet	Not found in 1995–1996, 1999–2001, and 2003–2004 surveys at Owens Lake bed; Not found during surveys on site. Habitat found in proposed project / proposed action study area

Note:
CNPS ranking system =

List 1B: Rare, threatened or endangered in California and elsewhere.
List 2: Plants is rare, threatened or endangered in California but more common elsewhere.
List 3: Plants about which we need more information.
List 4: Plants of limited distribution.
Threat ranks:
0.1: Seriously threatened in California.
0.2: Fairly threatened in California.
0.3: Not very threatened in California.

Four plant species designated as priority plant species were identified as having the potential to occur within the region of the proposed project / proposed action study area based on literature review and analysis of habitat suitability: Booth's evening primrose (*Camissonia boothii* ssp. *boothii*), Lincoln rock cress (*Boechera lincolnensis*), naked milk-vetch (*Astragalus serenoi* var. *shockleyi*), and Nevada oryctes (*Oryctes nevadensis*). These five plant species were targeted for directed surveys and habitat assessments. Directed surveys and habitat assessments were guided by information on the distribution, description, habitat requirements, and reproduction of listed plant species gathered from a CNDDB search and the District's summary list of flora and fauna observed at the Keeler Dunes.[44,45]

Booth's Evening Primrose. As a result of directed surveys, Booth's evening primrose was determined to be absent within the proposed project / proposed action study area. Booth's evening primrose is designated as a CNPS List 2.3 plant (rare, threatened or endangered in California but more common elsewhere). Booth's evening primrose has been determined to be absent in the proposed project / proposed action study area as a result of literature review, agency coordination, consultation with experts, and detailed field surveys. Based on the review of the CNDDB, the closest occurrence of this species is located 10.8 miles west of the proposed project / proposed action boundary. As a result of the habitat assessment and field surveys, habitat suitable to support Booth's evening primrose was identified, but individuals were not found within the proposed project / proposed action.

Lincoln Rock Cress. As a result of directed surveys, Lincoln rock cress was determined to be absent within the proposed project / proposed action study area. Lincoln rock cress is designated as a CNPS List 2.3 plant (rare, threatened or endangered in California but more common elsewhere). Lincoln rock cress has been determined to be absent in the proposed project / proposed action study area as a result of literature review, agency coordination, consultation with experts, and detailed field surveys. Based on the review of the CNDDB, the closest occurrence of this species is located 9.4 miles northeast of the proposed project / proposed action boundary. As a result of the habitat assessment and field surveys, habitat suitable to support Lincoln rock cress was identified, but individuals were not found within the proposed project / proposed action.

Naked Milk-Vetch. As a result of directed surveys, naked milk-vetch was determined to be absent within the proposed project / proposed action study area. Naked milk-vetch is designated as a CNPS List 2.2 plant (rare, threatened or endangered in California but more common elsewhere). naked milk-vetch has been determined to be absent in the proposed project / proposed action study area as a result of literature review, agency coordination, consultation with experts, and detailed field surveys. Based on the review of the CNDDB, the closest occurrence of this species is located 3.1 miles north of the proposed project / proposed action boundary. As a result of the habitat assessment and field surveys, habitat suitable to support naked milk-vetch was identified, but individuals were not found within the proposed project / proposed action.

Nevada Oryctes. As a result of directed surveys, Nevada oryctes was determined to be absent within the proposed project / proposed action study area. Nevada oryctes is designated as a CNPS List 2.1 plant (rare, threatened or endangered in California but more common elsewhere). Nevada oryctes has been determined to be absent in the proposed project / proposed action study area as a result of literature review, agency coordination, consultation with experts, and detailed field surveys. Based on the review of the CNDDB, the closest occurrence of this species is located 6.7 miles northwest of the proposed project / proposed action boundary. As a result of the habitat assessment and field surveys,

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[44] California Department of Fish and Wildlife. 2012. *California Natural Diversity Database, Rarefind 4*. Sacramento, CA.

[45] Great Basin Unified Air Pollution Control District. 2011. *A Summary of the Flora and Fauna Observed in the Keeler Dunes Between 11/2007 and 5/2011*. Bishop, CA.

habitat suitable to support Nevada oryctes was identified, but individuals were not found within the proposed project / proposed action.

B. Special Status Wildlife Species

Federally Listed Species

No wildlife species listed as proposed, candidate, threatened or endangered under the federal ESA were identified as having the potential to occur within the survey area and none were identified during biological surveys. This was based on the literature review, previously prepared reports, a query of the CNDDB for the topographic quadrangles for the proposed project / proposed action study area and vicinity, consultation with experts on the area's biological resources, and biological surveys.

Directed surveys and habitat assessments were guided by information on the distribution, description, habitat requirements, and reproduction of listed plant species gathered from the following sources: CNDDB search,[46] and District's summary list of flora and fauna observed in the Keeler Dunes

State-Listed Species

State listed species are those species provided special legal protection under CESA. A state-listed endangered species is a species that is in danger of extinction throughout all or a significant portion of its range. A state-listed threatened species is one that is likely to become endangered in the absence of special protection or management efforts provided by the listing. A candidate species is one that is proposed by the state government for listing as endangered or threatened.

The literature review, previously prepared reports, a query of the CNDDB for the USGS 7.5-minute series topographic quadrangles for the proposed project / proposed action study area and vicinity, and consultation with experts on the area's biological resources identified one wildlife species state-designated as rare, threatened, or endangered as having the potential to occur in the region of the proposed project / proposed action study area: Mohave ground squirrel (*Xerospermophilus mohavensis*) (Table 3.3.3.4-3, *State-Listed Species with the Potential to Occur in the Region of the Proposed Project / Proposed Action Study Area*).[47,]

[46] California Department of Fish and Wildlife. 2012. *California Natural Diversity Database*. Sacramento, CA.

[47] California Department of Fish and Wildlife. 2012. *California Natural Diversity Database*, *Rarefind 4: Database*. Sacramento, CA.

TABLE 3.3.3.4-3
STATE-LISTED SPECIES WITH THE POTENTIAL TO OCCUR IN THE REGION OF THE PROPOSED PROJECT / PROPOSED ACTION STUDY AREA

Species	Status	Habitat	Occurrence
Wildlife			
Mohave ground squirrel (*Spermophilus mohavensis*)	ST	Prefers sandy gravelly soils in open desert scrub, alkali scrub and Joshua tree woodland	Not found during 1995–1996 and 2004 surveys proposed project / proposed action study area; record of occurrence from south of Keeler Dunes along State Highway 136 less than 1 mile from the proposed project / proposed action study area; there is limited suitable habitat in proposed project / proposed action study area north of Highway 136. Species not observed during general wildlife surveys.

Key:
SE = Listed as a candidate by the State of California
SE = Listed as endangered by the State of California
SR = Listed as rare by the State of California
ST = Listed as threatened under the State of California

There is one State-listed endangered, threatened or candidate wildlife species determined to have the potential to occur within the proposed project / proposed action study area. This species was targeted for directed surveys and habitat assessments (Appendix D). The directed surveys and habitat assessments were guided by information on the distribution, description, habitat requirements, and reproduction of listed species gathered from the CNDDB search and District's summary list of flora and fauna observed in the Keeler Dunes.[48,49]

Mohave Ground Squirrel. The proposed project / proposed action study area contains a small portion of marginally suitable habitat to support the species. The Mohave ground squirrel is a state-threatened species that occurs in desert scrub, alkali scrub, and Joshua tree woodland habitats. Although desert scrub habitat (creosote bush – white burr sage scrub) does occur in the proposed project / proposed action study area north of Highway 136, desert scrub habitat will be avoided since project activities are limited to the area south of Highway 136. Mohave ground squirrel was not observed during plant community mapping, habitat assessment, and presence/absence surveys. This species was determined unlikely to occur at the proposed project / proposed action study area due to the limited presence of suitable habitat, lack of vegetation and location of the proposed project / proposed study area outside of the species' known range.

[48] California Department of Fish and Wildlife. 2012. *California Natural Diversity Database*. Sacramento, CA.

[49] Great Basin Unified Air Pollution Control District. 2011. *A Summary of the Flora and Fauna Observed in the Keeler Dunes Between 11/2007 and 5/2011*. Bishop, CA.

BLM Sensitive Species

BLM sensitive wildlife species include all species currently designated by the California BLM State Director.

There is are three BLM sensitive wildlife species determined to have the potential to occur within the proposed project / proposed action study area (Table 3.3.3.4-6, *BLM Sensitive Wildlife Species with the Potential to Occur in the Region of the Proposed Project / Proposed Action Study Area*). This species was targeted for directed surveys and habitat assessments (Appendix D). The directed surveys and habitat assessments were guided by information on the distribution, description, habitat requirements, and reproduction of listed species gathered from the CNDDB search and District's summary list of flora and fauna observed in the Keeler Dunes.[50,51]

TABLE 3.3.3.4-4
BLM SENSITIVE WILDLIFE SPECIES WITH THE POTENTIAL TO OCCUR IN THE REGION OF THE PROPOSED PROJECT / PROPOSED ACTION STUDY ARE

Species	Status	Habitat	Occurrence
Wildlife			
Golden eagle (*Aquila chrysaetos*)	BLM, FPS	Nests on steep cliff faces or atop tall species of trees with snags	Present in Owens Lake area in previous surveys; Limited potential for utilization at proposed project / proposed action study area are due to low prey base and no habitat for breeding, but low numbers of black-tailed jack rabbits (*Lepus californicus)* do occur on site.
Mohave ground squirrel (*Spermophilus mohavensis*)	BLM	Prefers sandy gravelly soils in open desert scrub, alkali scrub and Joshua tree woodland	Not found during 1995–1996 and 2004 surveys proposed project / proposed action study area; record of occurrence from south of Keeler Dunes along State Highway 136 less than 1 mile from the proposed project / proposed action study area; there is limited suitable habitat in proposed project / proposed action study area north of Highway 136. Species not observed during general wildlife surveys.
Owens Valley vole (*Microtus californicus vallicola*)	BLM	Found in friable soils of wetlands and lush grassy ground in the Owens Valley	There is no suitable habitat in proposed project / proposed action study area. Species not observed during general wildlife surveys.

Key:
BLM = Bureau of Land Management sensitive species
CSC = California species of special concern
FPS = Federally protected species

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[50] California Department of Fish and Wildlife. 2012. *California Natural Diversity Database*. Sacramento, CA.

[51] Great Basin Unified Air Pollution Control District. 2011. *A Summary of the Flora and Fauna Observed in the Keeler Dunes Between 11/2007 and 5/2011*. Bishop, CA.

Golden Eagle. The proposed project / proposed action study area contains limited foraging habitat to support the species. The golden eagle is a BLM sensitive wildlife species and federal protected species that occurs in many habitats and nests on steep cliff faces or atop tall trees with snags. Although foraging habitat is present, a low prey base occurs on the proposed project/ proposed action study area. No breeding habitat occurs within the proposed project / proposed action study area. Golden eagle was not observed during plant community mapping, habitat assessment, and presence/absence surveys. This species was determined unlikely to occur at the proposed project / proposed action study area due to the presence of limited foraging habitat. The nearest CNDDB occurrence of a golden eagle nest is located approximately 16 miles to the south of the proposed project / proposed action study area in the Coso Mountains.

California Species of Special Concern

California species of special concern include all species designated as such by CDFW and exclude species which are listed under the federal ESA or CESA.

The above-described review identified 10 sensitive wildlife species as having the potential to occur within the region of the proposed project / proposed action study area. These 10 species were therefore targeted for directed surveys and habitat assessments: American peregrine falcon (*Falco peregrinus anatum*), California horned lark (*Eremophila alpestris actia*), Le Conte's thrasher *(Toxostoma lecontei*), Loggerhead shrike (*Lanius ludovicianus*), merlin (*Falco columbarius*), northern harrier (*Circus cyaneus*), prairie falcon (*Falco mexicanus*), American badger (*Taxidea taxus*), Owens Valley vole (*Microtus californicus vallicola*), and Southern grasshopper mouse (*Onychomys torridus ramona*) (Table 3.3.3.4-5, *California Species of Special Concern and Fully Protected Species with the Potential to Occur in the Region of the Proposed Project / Proposed Action Study Area*).

TABLE 3.3.3.4-5
CALIFORNIA SPECIES OF SPECIAL CONCERN WITH THE POTENTIAL TO OCCUR IN THE REGION OF THE PROPOSED PROJECT / PROPOSED ACTION STUDY AREA

Species	Status	Habitat	Occurrence
Wildlife			
American peregrine falcon (*Falco peregrinus anatum*)	CSC	Scarce migrants may occur at sites in the desert where suitable avian prey is concentrated, such as shorebird populations at flooded areas on Owens Lake	Not observed on the proposed project / proposed action study area. Very limited potential for utilization at proposed project / proposed action study area due to low prey base and absence of suitable habitat.
California horned lark (*Eremophila alpestris actia*)	CSC	Nests on open grassland areas with exposed surfaces	Observed in proposed project / proposed action area. There is suitable habitat in the proposed project / proposed action area.
Le Conte's thrasher (*Toxostoma lecontei*)	CSC	Resides in desert habitats; primarily in open desert wash, desert scrub, alkali desert scrub, desert succulent scrub	Limited/low-grade suitable habitat in proposed project / proposed action study area. Observed breeding on the proposed project / proposed action study area.
Loggerhead shrike (*Lanius ludovicianus*)	CSC	Nests and resides in desert scrub and savannah woodland habitats	Good potential for utilization at proposed project / proposed action study area due to adequate

TABLE 3.3.3.4-5
CALIFORNIA SPECIES OF SPECIAL CONCERN WITH THE POTENTIAL TO OCCUR IN THE REGION OF THE PROPOSED PROJECT / PROPOSED ACTION STUDY AREA, *CONTINUED*

Species	Status	Habitat	Occurrence
			perches for hunting and moderate prey base, but no habitat for breeding. Observed foraging on the western portion of the proposed project / proposed action study area.
Merlin (*Falco columbarius*) (wintering)	CSC	Migrant and winter visitor found in areas in the desert where suitable avian prey is concentrated, such as shorebirds	Not observed on the proposed project / proposed action study area. Very limited potential for utilization at proposed project / proposed action study area due to low prey base and absence of suitable habitat.
Northern harrier (*Circus cyaneus*) (Nesting)	CSC	Nests in riparian habitats and forages over open grasslands, marshes, and wetland areas	Observed foraging over the western portion of the proposed project / proposed action study area. Very limited potential for utilization at proposed project / proposed action study area due to low prey base and absence of suitable habitat.
Prairie falcon (*Falco mexicanus*)	CSC	Regular visitor to Owens Valley, nests on cliff faces	Limited potential for utilization at proposed project / proposed action study area are due to low prey base and little suitable habitat. Observed flying over the western portion of the proposed project / proposed action study area.
American badger (*Taxidea taxus*)	CSC	Most numerous in California in the Great Basin region; fluctuating with populations of squirrels and pocket gophers; in open areas, including deserts	Foraging habitat found in proposed project / proposed action study area. Occasional badger sign in proposed project / proposed action study area; no den sites observed during on-site surveys, one previous visual observation in proposed project / proposed action study area.
Owens Valley vole (*Microtus californicus vallicola*)	BLM, CSC	Found in friable soils of wetlands and lush grassy ground in the Owens Valley	There is no suitable habitat in proposed project / proposed action study area. Species not observed during general wildlife surveys.
Southern grasshopper mouse (*Onychomys torridus ramona*)	CSC	Present in prairies and deserts in grass, sagebrush, greasewood with sandy or gravelly soil	Limited potential habitat found in proposed project / proposed action study area.

Key: BLM = Bureau of Land Management sensitive species
CSC = California species of special concern
FPS = federally protected species

American Peregrine Falcon. The habitat assessment and plant community mapping found low-grade suitable foraging habitat for American peregrine falcon throughout the proposed project / proposed action study area, primarily in the western areas closer to marsh habitats and shallow flooding areas of the Owens Lake bed. American peregrine falcon is a California species of special concern. CNDDB records for this species are suppressed. The American peregrine falcon was listed as endangered under CESA. The entire proposed project / proposed action study area was determined to be of very limited use for foraging by the American peregrine falcon.

California Horned Lark. California horned lark has been determined to be present in the proposed project / proposed action study area as a result of detailed field surveys and literature review. Observations of the California horned lark were made during Sapphos Environmental, Inc. conducted surveys, in the proposed project / proposed action study area. Suitable habitat for the species is present on the proposed project / proposed action site.

Le Conte's Thrasher. Le Conte's thrasher has been determined to be present in the proposed project / proposed action study area as a result of detailed field surveys and literature review. Observations of the Le Conte's thrasher and their nests were made during Sapphos Environmental, Inc. conducted surveys in the proposed project / proposed action study area. Suitable habitat for the species is present on the proposed project / proposed action site.

Loggerhead Shrike. Loggerhead shrike has been determined to be present in the proposed project / proposed action study area as a result of detailed field surveys and literature review. Observations of loggerhead shrike on the western portion of the proposed project / proposed action study area have been made. Suitable habitat for the species is present on the proposed project / proposed action site.

Merlin. The habitat assessment and plant community mapping found low-grade suitable foraging habitat for merlin throughout the proposed project / proposed action study area, primarily in the western areas closer to marsh habitats and shallow flooding areas of the Owens Lake bed. Merlin is a California species of special concern. CNDDB records for this species are suppressed. The entire proposed project / proposed action study area was determined to be of very limited use for foraging by merlin.

Northern Harrier. Directed surveys identified no suitable breeding habitat for northern harrier breeding within the proposed project / proposed action study area. The proposed project / proposed action study area lacks riparian habitats and open grasslands. Northern harriers, California species of special concern, have occasionally been seen foraging on the western portion of the proposed project / proposed action study area. Northern harriers nest on the ground in well-concealed locations, often near low shrubs or in tall clumps of vegetation. Nesting locations are usually in abandoned fields, wet meadows, and coastal and inland marshes. CNDDB records for this species are suppressed. Northern harriers were not observed during plant community mapping, habitat assessment, and presence/absence surveys. This species was determined unlikely to occur at the proposed project / proposed action study area due to the absence of habitat suitable to support this species.

Prairie Falcon. Prairie falcon is a California species of special concern that is frequently been seen foraging to the west the proposed project / proposed action study area over the bed of Owens Lake and may utilize the proposed project / proposed action study area for hunting. CNDDB records for this species are suppressed. Prairie falcon is a desert and grassland species that nests in cliffs and preys mainly on birds and squirrels. The entire proposed project / proposed action study area was determined to be of limited use for foraging by the prairie falcon.

American Badger. American Badger is a California species of special concern. As a result of directed field investigations, the American badger was determined to be present in the proposed project / proposed action study area. Although no dens or evidence of on-site breeding was recorded, American badger is known to occasionally frequent the proposed project / proposed action site, most likely for foraging. The American badger is a wide-ranging species that occurs throughout most of the western United States, except for humid coastal plains. Reduction in numbers is primarily attributed to the conversion of grassland habitats to farmland.

Owens Valley Vole. Owens Valley vole is a California species of special concern that is found in friable soils of wetlands and lush grassy ground in the Owens Valley. Based on the review of the CNDDB, four of the closest occurrences are located approximately 500 feet east of Highway 395 in Olancha. Marginally suitable habitat occurs in the Owens Lake bed, but not within the boundary of the proposed project / proposed action study area due to the lack of friable soils. Owens Valley vole has been found during focused surveys in other parts of the Owens Lake bed.

Southern Grasshopper Mouse. Southern grasshopper mouse is a California species of special concern that is found in in prairies and deserts in grass, sagebrush, and greasewood with sandy or gravelly soil. Based on the review of the CNDDB, there are no occurrences located within Inyo County. Suitable habitat occurs within the boundary of the proposed project / proposed action study area. Southern grasshopper mouse has been found during focused surveys in other parts of the Owens Lake bed.

Locally Important Species

Locally important species are rare, unusual, or key species that are not listed as threatened or endangered under the federal or state ESA, are not designated as a sensitive by BLM or a species of special concern by CDFW.

Seven locally important wildlife species were determined to have the potential to occur within the proposed project / proposed action study area and therefore were targeted for directed surveys and habitat assessments: *Tescalsia gulianiata*, alkali flats tiger beetle (*Cicindela willistoni pseudosenilis*), alkali skipper (*Pseudocopaeodes eunus*), Owens dune weevil (*Trigonoscuta owensii*), Owens Valley tiger beetle (*Cicindela tranquebarica inyo*), slender girdled tiger beetle (*Cicindla tenuicincta*), and Bell's sparrow (*Amphispiza belli canensis*). Directed surveys and habitat assessments were guided by information on the distribution, description, habitat requirements, and reproduction of listed plant species gathered from the CNDDB and the District's summary list of flora and fauna observed in the Keeler Dunes[52,53] (Table 3.3.3.4-6, *Locally Important Species with the Potential to Occur in the Region of the Proposed Project / Proposed Action Study Area*).

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[52] California Department of Fish and Wildlife. 2012. *California Natural Diversity Database*. Sacramento, CA.

[53] Great Basin Unified Air Pollution Control District. 2011. *A Summary of the Flora and Fauna Observed in the Keeler Dunes between 11/2007 and 5/2011*. Bishop, CA.

Table 3.3.3.4-6
Locally Important Species with the Potential to Occur in the Region of the Proposed Project / Proposed Action Study Area

Species	Status	Habitat	Occurrence
Wildlife			
Alkali flats tiger beetle (*Cicindela willistoni pseudosenilis*)	Locally rare	Dune and alkali meadow habitats	There is suitable habitat in proposed project / proposed action study area. Species not observed during directed surveys in 2011/2012.
Alkali skipper (*Pseudocopaeodes eunus*)	Locally rare	Dune and alkali meadow habitats	There is suitable habitat in proposed project / proposed action study area. Species not observed during directed surveys in 2011/2012.
Moth (no common name) (*Tescalsia guilianata*)	Locally rare	Dune and alkali meadow habitats	Suitable habitat found in dunes and sand hummocks present within proposed project / proposed action study area. Species not observed during directed surveys in 2011/2012.
Owens dune weevil (*Trigonoscuta owensii*)	Locally rare	Dune and alkali meadow habitats	Found at Olancha Dunes and dunes northwest of Keeler during 1995–1996 surveys; found during 2003 surveys in the Owens Lake area; potential habitat found within dunes; determined present as a result of presence/absence surveys in 2011 and 2012.
Owens Valley tiger beetle (*Cicindela tranquebarica inyo*)	Locally rare	Dune and alkali meadow habitats	There is suitable habitat in proposed project / proposed action study area. Species not observed during directed surveys in 2011/2012.
Slender-girdled tiger beetle (*Cicindla tenuicincta*)	Locally rare	Dune and alkali meadow habitats	There is suitable habitat in proposed project / proposed action study area. Species not observed during directed surveys in 2011/2012.
Bell's sparrow (*Amphispiza belli canensis*) (desert populations only)	BCC, WL	Found in sagebrush, arid bushland, and chaparral habitats; desert populations breed during winter in the Owens Valley	There is no suitable breeding habitat, observed as a result of general wildlife surveys in 2011 or 2012.

Key:
BCC = Designated as birds of conservation concern by the USFWS.
WL = Designated as species on the CDFW watch list.
Locally rare = Designated as locally important by Inyo County, the Audubon Society, CDFW, and/or the 1997 Environmental Impact Report.
Source: ^ Martinson, Sharon J. May 2012. *Summary of Services Provided & Results*.

Tescalsia Gulianiata. Literature review, agency coordination, consultation with experts, and detailed field surveys determined *Tescalsia giulianiata* to be potentially present in the proposed project / proposed action study area. *Tescalsia giulianiata* have only been recorded from a few locations, with most of the insects collected around dunes at Deep Spring, within the Alabama Hills, and around Owens Lake. However, the proposed project / proposed action study area has suitable habitat for *Tescalsia giulianiata*, and the entomology collection at the Essig Museum has a specimen collected 9 miles northwest of Keeler. This species is very cryptic and has not been well described. For example, the larval food plant for *Tescalsia giulianiata* is unknown. It is best to assume that this species is potentially present at the proposed project / proposed action study area because of the absence of detailed habitat-related information for this species, its limited flight period each year, and the known records of occurrence around Owens Lake.[54]

Owens Dune Weevil. Detailed field surveys determined Owens dune weevil, also known as the Owens sand dune snout beetle, to be present in the proposed project / proposed action study area. Owens dune weevil was observed seven times during May 2011 surveys and once during May 2012 surveys. These individuals were observed in sandy, barren areas (two individuals), and in Parry's Saltbush (three individuals) and Parry's Saltbush/Greasewood (one individual) vegetation type areas. Prior to May 2011, two additional incidental observations of the species were made in sandy, barren areas along the dunes.

The genus *Trigonoscuta* is a valid classification, and the individuals observed were of this genus; however, the scientific validity of the species *owensii* is unconfirmed, and the entire *Trigonoscuta* genus needs taxonomic reclassification and revision. It is possible that species within individual dune groupings represent different species or subspecies because many *Trigonoscuta* weevils have limited mobility, are mainly confined to patchy dunes, and may have evolved within different populations despite proximity to other dunes. Review of the insect collection at the Southern Inyo Museum in the town of Lone Pine revealed that *Trigonoscuta owensii* has been collected from many locations in and around Lone Pine, suggesting that this weevil species may be a generalist and is found in many places in the Owens Valley.[55]

Alkali Flats Tiger Beetle, Alkali Skipper, Owens Valley Tiger Beetle, and Slender-Girdled Tiger Beetle. Literature review, agency coordination, consultation with experts, and detailed field surveys determined Alkali Flats Tiger Beetle, Alkali Skipper, Owens Valley Tiger Beetle, and Slender-Girdled Tiger Beetle to be potentially present in the proposed project / proposed action study area. Suitable habitat for the four species is described as dune and alkali meadow habitats and is present for all four species on the proposed project / proposed action study area. However, these species were not observed during detailed field surveys in the proposed project / proposed action study area.

Bell's Sparrow. Bell's sparrow has been determined to be present in the proposed project / proposed action study area as a result of detailed field surveys and literature review. Observations of Bell's sparrow on the proposed project / proposed action study area have been made. Suitable foraging habitat for the species is present on the proposed project / proposed action site.

C. Riparian Habitat or Sensitive Natural Communities

There are no wetlands, riparian habitat, or any other state-designated sensitive habitats present within the proposed project / proposed action area. There is a main, active drainage in the proposed project / proposed action study area brings water that is captured by the southern diversion berm and directs it through a series of channels that cross through the Keeler Dunes. Neither the main active drainage nor its series of channels contain riparian habitat. Additionally, the drainage and channels occur outside proposed project / proposed action impact areas.

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[54] Martinson, Sharon J. May 2012. "Summary of Services Provided & Results." Prepared for: Sapphos Environmental, Inc., Pasadena, CA.

[55] Martinson, Sharon J. May 2012. "Summary of Services Provided & Results." Prepared for: Sapphos Environmental, Inc., Pasadena, CA.

D. Jurisdictional Waters

USACOE Jurisdictional Waters

The NWI map was reviewed for the proposed project / proposed action study area.[56] One wetland area was identified within the proposed project / proposed action study area as potentially subject to the regulatory jurisdiction of the USACOE pursuant to Section 404 of the federal Clean Water Act (Figure 3.3.1.2-1). According to the NWI, the identified wetland area is classified as freshwater emergent wetland. However, no federally protected wetlands were identified in proposed project / proposed action study area. Subsequent wetlands mapping conducted by Jones and Stokes Associates, Inc. in this area in 1995 identified a wetland located at the 3,600 feet above mean sea level regulatory shoreline.[57] The District has indicated that this area was a former wetland that has been covered by sand migration.[58]

The determination of absence of federally protected wetlands within impact areas of the proposed project / proposed action was based on ground-truthing and review of the NWI and Jones and Stokes maps. The southeast corner of the proposed project / proposed action study area was indicated as a wetland on the most recent (circa 1980s) NWI map and the subsequent 1995 wetlands delineation[59,60] (Figure 3.3.1.2-1). However, no apparent wetland features were identified where the NWI record exists.

Although both species of commonly occurring plants on site, Parry's saltbush (*Atriplex parryi*) and greasewood (*Sarcobatus vermiculatus*), can occur as a hydrophyte, they are facultative species that can either occur as an uplands species or wetlands species.[61] The proposed project / proposed action study area does not appear to exhibit wetlands hydrology, as much of the site is sandy and will not hold water. No direct indications of wetlands were noted during surveys based on the absence of the three key criteria at any given point in the proposed project / proposed action study area: hydrophytic vegetation, hydric soils, and wetland hydrology.

CDFW Jurisdictional Waters

CDFW generally takes jurisdiction of all stream features including drains and canals. The CDFW jurisdiction extends from the top of bank to the opposite top of bank on these features or the limits of riparian vegetation if this vegetation extends beyond the top of the banks. Wetlands need to only fulfill one of the three aforementioned USACOE criteria (hydrology, hydric soils, wetland vegetation) to be considered CDFW jurisdictional wetlands.

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[56] U.S. Fish and Wildlife Service. 2012. *National Wetlands Inventory*. Available at: http://www.fws.gov/wetlands/index.html

[57] Jones & Stokes Associates, Inc. 1996. *Delineation of Waters of the United States for the Owens Lake Playa* (JSA 95-330). Prepared for: U.S. Army Corps of Engineers, Los Angeles District, Ventura, CA. Prepared by: Jones & Stokes Associates, Inc., Sacramento, CA; and Great Basin Unified Air Pollution Control District, Bishop, CA.

[58] Holder, G., Great Basin Unified Air Pollution Control District, Bishop, CA. 28 September 2011. Email to D. Grotzinger, Sapphos Environmental, Inc., Pasadena, CA.

[59] Jones & Stokes Associates, Inc. 1996. *Delineation of Waters of the United States for the Owens Lake Playa* (JSA 95-330). Prepared for: U.S. Army Corps of Engineers, Los Angeles District, Ventura, CA. Prepared by: Jones & Stokes Associates, Inc., Sacramento, CA, and Great Basin Unified Air Pollution Control District, Bishop, CA.

[60] U.S. Fish and Wildlife Service. 2012. *National Wetlands Inventory*. Available at: http://www.fws.gov/wetlands/index.html

[61] U.S. Department of Agriculture Natural Resources Conservation Service. 2012. *2012 National Wetland Plant List*. Available at: http://plants.usda.gov/wetland.html

Under Section 1600 of the State Fish and Game Code, CDFW jurisdiction includes "bed, channel or bank of any river, stream or lake designated by the department in which there is any time an existing fish or wildlife resource or from which these resources derive benefit." Canals, aqueducts, irrigation ditches, and other means of water conveyance can also be considered streams if they support aquatic life, riparian vegetation or stream dependent terrestrial benefit.

One wetland area, as described in USACOE Jurisdictional Waters, was identified within the proposed project / proposed action study area as potentially subject to the regulatory jurisdiction of the CDFW pursuant to Section 1600 of the State Fish and Game Code. No direct indications of wetlands were noted during surveys as indicated above due to the lack of vegetation and presence of sand migration.

E. Habitat Connectivity and Wildlife Corridors

Wildlife movement corridors and habitat linkages are areas that connect suitable wildlife habitat areas in a region otherwise fragmented by rugged terrain, changes in vegetation, or human disturbance. Corridors are generally local pathways connecting short distances usually covering one or two main types of vegetation communities. Linkages are landscape level connections between very large core areas and generally span several thousand feet and cover multiple habitat types. Natural features such as canyon drainages, ridgelines, or areas with vegetation cover provide corridors and linkages for wildlife travel. The habitat connectivity provided by corridors and linkages is important in providing access to mates, food, and water, allowing the dispersal of individuals away from high-density areas, and facilitating the exchange of genetic traits between populations.

The Owens Valley is a known wildlife corridor for avifauna. As a result of the studies documented in the Biological Resources Technical Report, the following resources were reviewed with regards to habitat connectivity and wildlife corridors: the USGS 7.5-minute, Dolomite, California, topographic quadrangle, and consultation with local experts on biological resources. Documented, known, or potential wildlife corridors or breeding areas were determined to be absent within the proposed project / proposed action study area. Additionally, wildlife species are able to move freely throughout the survey area and are not restricted to a specific corridor or linkage.

F. Fisheries

As a result of the studies documented in the Biological Resources Technical Report; review of the USGS 7.5-minute, Dolomite, California, topographic quadrangle; and consultation with local experts on biological resources within the region of the Keeler Dunes, no documented, known, or potential fisheries or essential fish habitat were determined to be present within or adjacent to the proposed project / proposed action study area. Essential fish habitat is defined as those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity. The proposed project / proposed action study area lacks aquatic habitat. The nearest habitat capable of sustaining fish populations is located at the Owens River approximately 4 miles to the west of the proposed project / proposed action site.

3.4 CULTURAL RESOURCES

This section provides a background discussion of the regulatory framework and the affected environment that govern cultural resources. The regulatory framework discussion focuses on the federal, state, and local regulations. The affected environment discussion focuses on the Area of Potential Effect (APE), the cultural setting, records search results, field survey results, and Native American cultural and religious concerns.

The information that is presented in this section is based on the cultural resource records searches, inventories, and Native American scoping conducted by Sapphos Environmental, Inc. and as discussed in the proposed project / proposed action's Cultural Resources Technical Report in August 2013, which is included as Appendix E of this document. This section also includes data that have resulted from extensive fieldwork, research, and monitoring conducted by the BLM within the proposed project / proposed action area between 2005 and 2013, as well as information related to formal Native American consultation conducted by BLM pursuant to Section 106 of the National Historic Preservation Act (NHPA). Due to the confidential nature of the location of cultural resources, this report does not include maps or location descriptions.

3.4.1 REGULATORY FRAMEWORK

The EIR/EA was prepared as a joint state/federal environmental document. The EIR portion of the document has been prepared pursuant to CEQA[1] and the CEQA Guidelines.[2] The EA portion of this joint EIR/EA has been prepared pursuant to NEPA[3] and the Council on Environmental Quality's NEPA regulations[4] and reflects coordination with Section 106 of the NHPA. As such, both federal and state regulatory frameworks with regard to cultural resources are relevant to the proposed project / proposed action; additional explanation of the joint nature of this document is provided in Subsection 1.6.

3.4.1.1 FEDERAL

National Historic Preservation Act[5]

Enacted in 1966 and amended most recently in 2006, the NHPA declared a national policy of historic preservation and instituted a multifaceted program, administered by the Secretary of the Interior, to encourage the achievement of preservation goals at the federal, state, and local levels. The NHPA authorized the expansion and maintenance of the NRHP, established the position of State Historic Preservation Officer (SHPO) and provided for the designation of State Review Boards, set up a mechanism to certify local governments to carry out the purposes of the NHRA, assisted Native American tribes to preserve their cultural heritage, and created the Advisory Council on Historic Preservation (ACHP). Its implementing regulations, 36 CFR 800, are described below as Section 106.

1 California Public Resources Code Section 21000 et seq.

2 California Code of Regulations, Title 14, Section 15000 et seq.

3 42 U.S.C.§ 4321 et seq.

4 40 CFR § 1500-1508.

5 *United States Code*, Title 16, Section 470: "National Historic Preservation Act."

Section 106

Section 106 of the NHPA requires that federal agencies with direct or indirect jurisdiction over federally funded, assisted, or licensed undertakings "take into account the effects of their undertakings on historic properties" (i.e., any property that is included in, or eligible for inclusion in, the NRHP; see below).[6] The ACHP may choose to participate in the Section 106 process if the undertaking would have adverse impacts on important historic properties, presents important questions of policy or interpretation, has the potential for presenting procedural problems, or presents issues of concern to Native American tribes.[7] The Section 106 process involves establishing if the project constitutes an undertaking; identification of historic properties within an APE; determination if the undertaking will cause an adverse effect on historic resources; and resolution of those adverse effects through consultation, avoidance, project redesign, and the execution of a Memorandum of Agreement or Programmatic Agreement.

In addition to the ACHP, the California Office of Historic Preservation (OHP), federally recognized Native American Tribes, and applicants for federal permits/leases/funds participate in the process with the federal agency. Other interested members of the public—including individuals, organizations, and state-recognized Native American Tribes—are provided with opportunities to participate in the process. It should be noted that the Section 106 process has been streamlined for undertakings under the statutory or regulatory authority of the California BLM. Section 106 compliance for the proposed project / proposed action follows the process outlined in the *State Protocol Agreement among the California State Director of the Bureau of Land Management and the California State Historic Preservation Officer and the Nevada State Historic Preservation Officer*,[8] which was executed in 2007, extended in 2012, and revised in 2014, BLM is authorized to act on the SHPO's behalf on undertakings that culminate in "no historic properties affected" (36 CFR 800.4(d)(1)) and "no adverse effect" findings (36 CFR 800.5(b)).

National Register of Historic Places

The National Register of Historic Places (NRHP) was established by the NHPA of 1966 as "an authoritative guide to be used by Federal, State, and local governments, private groups and citizens to identify the Nation's cultural resources and to indicate what properties should be considered for protection from destruction or impairment."[9] The NRHP recognizes properties that are significant at the national, state, and local levels. To be eligible for listing in the NRHP, a resource must be significant in American or regional/local history, architecture, archaeology, engineering, or culture. Districts, sites, buildings, structures, and objects of potential significance must also possess integrity of location, design, setting, materials, workmanship, feeling, and association. A property is eligible

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[6] 36 CFR Part 800.1(a)

[7] Appendix A to 36 CFR Part 800

[8] USDI Bureau of Land Management. 2012 *State Protocol Agreement among the California State Director of the Bureau of Land Management and the California State Historic Preservation Officer and the Nevada State Historic Preservation Officer Regarding the Manner in which the Bureau of Land Management will meet its Responsibilities under the National Historic Preservation Act and the National Programmatic Agreement among the BLM, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers*. Agreement Document on file, California State Office, Bureau of Land Management, Sacramento, California.

[9] *Code of Federal Regulations*, Title 36, Part 60.2: "Effects of Listing under Federal Law."

for the NRHP if it meets one or more of the four established criteria and possesses integrity of location, design, setting, materials, workmanship, feeling, and association:[10]

(A) It is associated with events that have made a significant contribution to the broad patterns of our history;

(B) It is associated with the lives of persons who are significant in our past;

(C) It embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction; and/or

(D) It has yielded, or may be likely to yield, information important in prehistory or history.

Ordinarily cemeteries, birthplaces, or graves of historical figures, properties owned by religious institutions or used for religious purposes, structures that have been moved from their original locations, reconstructed historic buildings, and properties that are primarily commemorative in nature are not considered eligible for the NRHP unless they satisfy certain conditions. In general, a resource must be 50 years of age to be considered for the NRHP, unless it satisfies a standard of exceptional importance.[11]

National Environmental Policy Act

NEPA requires federal agencies to consider and report the potential environmental impacts of proposed federal actions. Projects likely to have major effects on the environment require the sponsoring agency to develop an Environmental Impact Statement that considers the environmental consequences of alternative project designs; projects likely to have minor effects require Environmental Assessments. "Environment" is defined broadly, and includes cultural resources, social values, and various aspects of the natural environment. Compliance with Section 106 of the NHPA is interlinked with NEPA compliance with respect to historic properties (i.e., historic structures, archaeological sites, traditional cultural properties). The BLM's regulations regarding NEPA are set forth in the NEPA BLM Handbook H-1790-1.[12] Treatment of cultural resources by the BLM is detailed in its Manual Series 8100, *et seq.*[13]

Native American Graves Protection and Repatriation Act of 1990

The Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 sets provisions for the intentional removal and inadvertent discovery of human remains and other cultural items from federal and tribal lands. It clarifies the ownership of human remains and sets forth a process for repatriation of human remains and associated funerary objects and sacred religious objects to the Native American groups claiming to be lineal descendants or culturally affiliated with the remains

[10] *Code of Federal Regulations*, Title 36, Part 60.4: "Criteria for Evaluation."

[11] U.S. Department of the Interior, National Park Service. 2002. *How to Apply the National Register Criteria for Evaluation*. National Register Bulletin 15. Washington, DC.

[12] Bureau of Land Management. 25 October 1988. *National Environmental Policy Act BLM Handbook H-1790-1*. Available at: http://www.blm.gov/nhp/efoia/wo/handbook/h1790-1.pdf

[13] Bureau of Land Management. 3 December 2004. *Manual Series 8100*. Available at: www.blm.gov

or objects. It requires any federally funded institution housing Native American remains or artifacts to compile an inventory of all cultural items within the museum or with its agency, and to provide a summary to any Native American tribe claiming affiliation.

American Indian Religious Freedom Act

The American Indian Religious Freedom Act (AIRFA) of 1978 was enacted to protect and preserve the traditional religious rights and cultural practices of Native Americans. These rights include, but are not limited to, access of sacred sites, freedom to worship through ceremonial and traditional rights and use, and possession of objects considered sacred. The AIFRA requires that federal agencies evaluate their actions and policies to determine if changes are needed to ensure that Native American religious rights and practices are not disrupted by agency practices. Such evaluations are made in consultation with native traditional religious leaders.

Executive Order 13007 (Indian Sacred Sites)

In managing federal lands, agencies shall, to the extent practicable, permitted by law, and not inconsistent with agency functions, accommodate Indian religious practitioners' access to and ceremonial use of Indian sacred sites. Agencies are to avoid adversely affecting the physical integrity of these sites, maintaining the confidentiality of such sites, and informing tribes of any proposed project / proposed actions that could restrict access to, ceremonial use of, or adversely affect the physical integrity of, sacred sites.

Federal Land Policy and Management Act of 1976

Legislation establishes public land policy and guidelines for the administration, management, protection, development, and enhancement of public lands. Regulations under the Federal Land Policy and Management Act (FLPMA) (43 USC 1701 *et seq.*) established the procedures that the BLM follows in managing public lands. These lands are to be managed in a manner that protects the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, archaeological, and paleontological values that, where appropriate, will preserve and protect certain public lands in their natural conditions, provide food and habitat for fish and wildlife and domestic animals, and provide for outdoor recreation and human occupancy and use by encouraging collaboration and public participation throughout the planning process.

3.4.1.2 STATE

California Environmental Quality Act

CEQA, encoded in Sections 21000 et seq. of the Public Resources Code with Guidelines for implementation codified in the California Code of Regulations, Title 14, Chapter 3, Sections 15000 et seq., requires state and local public agencies to identify the environmental impacts of proposed discretionary activities or projects to determine if the impacts will be significant and identify alternatives and mitigation measures that will substantially reduce or eliminate significant impacts to the environment. In this instance, the matter under consideration involves the implementation, operation, and maintenance of the proposed dust control project for the purpose of attaining the state and federal air quality standards for PM_{10}. Attainment is compulsory under the requirements of the Federal Clean Air Act. The project components associated with implementing this mandatory action to achieve attainment, including issuance of a Federal Right of Way permit, constitute discretionary actions pursuant to NEPA and CEQA. In this instance, all feasible solutions to achieve attainment of the air quality standards would require issuance of a Right of Way permit by the BLM. Failure to attain the standards may trigger federal sanctions that can include withholding California's federal highway funds.

Pursuant to CEQA, a historical resource is a resource listed in, or eligible for listing in, the CRHR. In addition, resources included in a local register of historical resources or identified as significant in a local survey conducted in accordance with state guidelines are also considered historical resources under CEQA, unless a preponderance of the facts demonstrates otherwise. According to CEQA, the fact that a resource is not listed in or determined eligible for listing in the CRHR or is not included in a local register or survey shall not preclude a lead agency, as defined by CEQA, from determining that the resource may be an historical resource as defined in California Public Resources Code (PRC) Section 5024.1.[14] Pursuant to CEQA, a project with an effect that may cause a substantial adverse change in the significance of an historical resource may have a significant effect on the environment.[15]

CEQA also applies to effects on archaeological sites. Archaeological sites may be eligible for the CRHR, and thus would qualify as historical resources under CEQA. If an archaeological site does not satisfy the criteria as an historical resource, but does meet the definition of a "unique archaeological resource," it is also subject to CEQA. A unique archaeological resource is defined as an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:[16]

(1) It contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information

(2) It has a special and particular quality such as being the oldest of its type or the best available example of its type

(3) It is directly associated with a scientifically recognized important prehistoric or historic event or person

California Register of Historical Resources

Created in 1992 and implemented in 1998, the CRHR is "an authoritative guide in California to be used by state and local agencies, private groups, and citizens to identify the state's historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change."[17] Certain properties, including those listed in or formally determined eligible for listing in the NRHP and California Historical Landmarks numbered 770 and higher, are automatically included in the CRHR. Other properties recognized under the California Points of Historical Interest program, identified as significant in historical resources surveys, or designated by local landmarks programs may be nominated for inclusion in the CRHR. A resource, either an individual property or a contributor to a historic district, may be listed in the CRHR if the

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[14] *California Code of Regulations*, Title 14, Chapter 3, CEQA Guidelines, Section 15064.5(a).

[15] *California Code of Regulations*, Title 14, Chapter 3, CEQA Guidelines, Section 15064.5(b).

[16] *California Public Resources Code*, Section 21083.2(g).

[17] *California Public Resources Code*, Section 5024.1(a).

State Historical Resources Commission determines that it meets one or more of the following criteria, which are modeled on NRHP criteria:[18]

(1) It is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage

(2) It is associated with the lives of persons important in our past

(3) It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values

(4) It has yielded, or may be likely to yield, information important in history or prehistory

Resources nominated to the CRHR must retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance.[19] It is possible that a resource whose integrity does not satisfy NRHP criteria may still be eligible for listing in the CRHP. Similarly, resources that have achieved significance within the last 50 years may be eligible for inclusion in the CRHR provided that enough time has lapsed to obtain a scholarly perspective on the events or individuals associated with the resource.[20]

Native American Heritage Commission

Section 5097.91 of the PRC established the Native American Heritage Commission (NAHC), whose duties include the inventory of places of religious or social significance to Native Americans and the identification of known graves and cemeteries of Native Americans on private lands. Section 5097.98 of the PRC specifies a protocol to be followed when the NAHC receives notification of a discovery of Native American human remains from a county coroner.

Health and Safety Code, Sections 7050 and 7052

Health and Safety Code, Section 7050.5 declares that, in the event of the discovery of human remains outside of a dedicated cemetery, all ground disturbance must cease and the county coroner must be notified. Section 7052 establishes a felony penalty for mutilating, disinterring, or otherwise disturbing human remains, except by relatives.

Penal Code, Section 622.5

Penal Code, Section 622.5 provides misdemeanor penalties for injuring or destroying objects of historic or archaeological interest located on public or private lands, but specifically excludes the landowner.

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[18] *California Public Resources Code*, Section 5024.1(c).

[19] Office of Historic Preservation. n.d. "Technical Assistance Bulletin 6: California Register and National Register, A Comparison (for Purposes of Determining Eligibility for the California Register)." Available at: www.ohp.parks.ca.gov

[20] Office of Historic Preservation. n.d. "Technical Assistance Bulletin 6: California Register and National Register, A Comparison (for Purposes of Determining Eligibility for the California Register)." Available at: www.ohp.parks.ca.gov

Public Resources Code, Section 5097.5

Public Resources Code, Section 5097.5 defines as a misdemeanor the unauthorized disturbance or removal of archaeological, historic, or paleontological resources located on public lands.

3.3.1.3 LOCAL

County of Inyo General Plan

The Land Use Element and Conservation and Open Space Element of the Inyo County General Plan set forth the following goal in relation to cultural resources: "Preserve and promote the historic and prehistoric cultural heritage of the County."[21] They include the following policies related to the preservation and promotion of Inyo County's cultural heritage that have relevance to the proposed project / proposed action:

> *Policy CUL-1.3, Protection of Cultural Resources:* Preserve and protect key resources that have contributed to the social, political, and economic history and prehistory of the area, unless overriding considerations are warranted.
>
> *Policy CUL-1.4, Regulatory Compliance:* Development and/or demolition shall be reviewed in accordance with the requirements of CEQA and the National Historic Preservation Act.

3.4.2 AFFECTED ENVIRONMENT

The affected environment addressed in this portion of the analysis includes the area defined by the District for the possible implementation of dust control measures (DCMs). The proposed project / proposed action study area measures approximately 870.6 acres and is located on BLM- and LADWP-administered lands in Inyo County, California. Not all portions of the proposed project / proposed action study area will be subjected to DCMs.

3.4.2.1 AREA OF POTENTIAL EFFECT

The APE for cultural resources measures 295.4 acres and consists of the portions of the proposed project / proposed action area that have been designated for DCMs, staging areas, and temporary access routes (Figure 3.4.2.1-1, *Area of Potential Effects for Cultural Resources*). These areas have the potential to be subjected to direct effects, such as ground disturbance resulting from the planting and establishment of native vegetation, construction of temporary access routes, and a temporary water delivery system. The APE includes a 100-foot buffer area surrounding the areas that are subject to direct ground disturbance that will account for indirect effects such as dust, foot traffic, and so forth.

[21] Inyo County Planning Department. December 2001. *Inyo County General Plan*. Independence, CA.

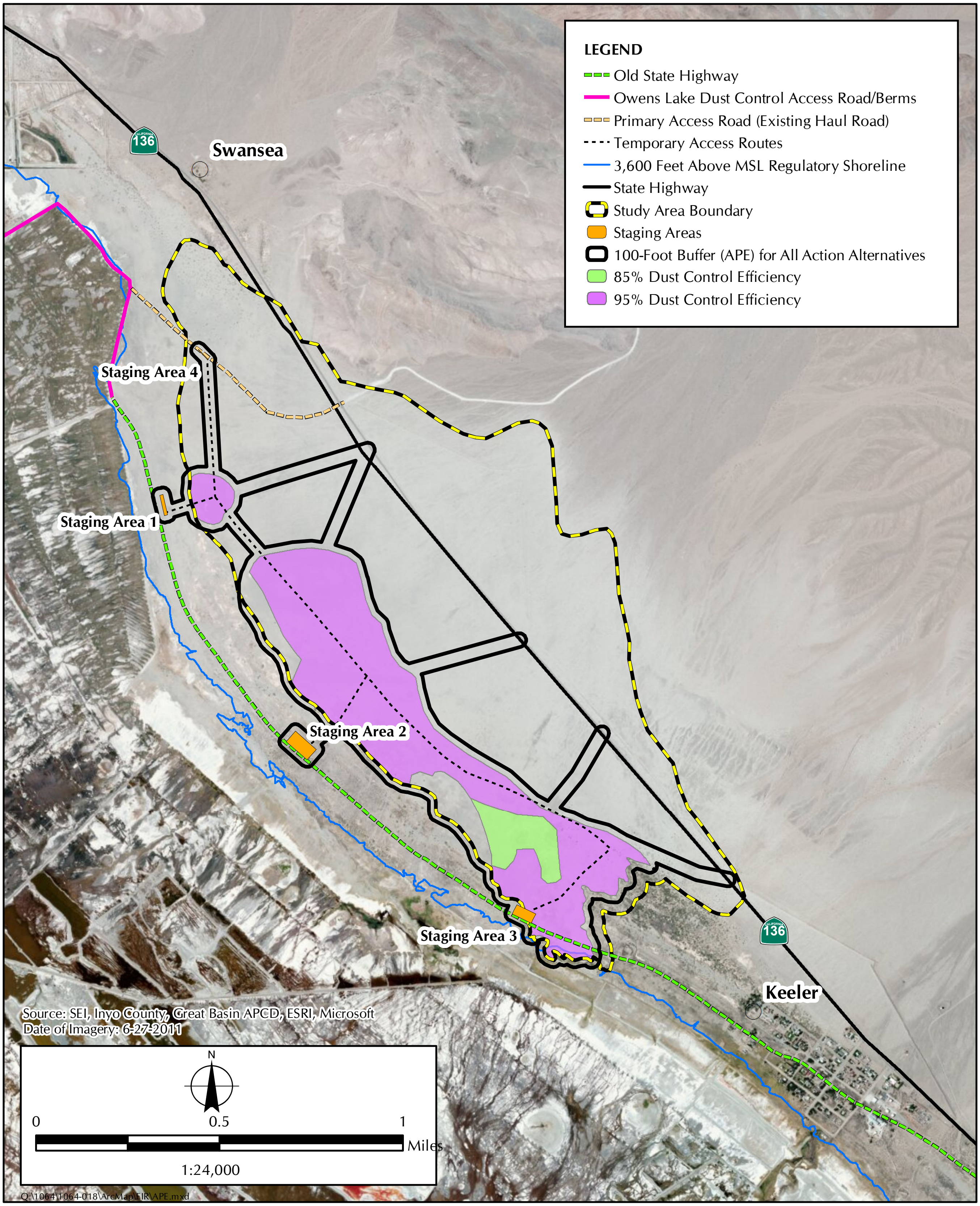

FIGURE 3.4.2.1-1
Area of Potential Effects for
Cultural Resources for All Action Alternatives

3.4.2.2 CULTURAL SETTING

A. Prehistoric Context

Archaeological data indicate that the Owens Valley has been inhabited for at least 11,000 years. The earliest sites in the area date to the Paleoindian Period (circa 12,000 years before present [BP] to 10,000 BP) and are largely recognized by the presence of fluted projectile points. Several examples of fluted Paleoindian projectile points have been found at Owens Lake.[22]

The quantity of archaeological sites and associated materials within the Owens Valley increased throughout the Holocene, beginning about 10,000 years BP, suggesting a growth in population of prehistoric people in the area. The Holocene can be divided into five major time periods including: Lake Mojave (circa 10,000 BP to 7,000 BP), Little Lake (7,000 BP to 3,500 BP), Newberry (circa 3,150 BP to 1,350 BP), Haiwee (circa 1,350 BP to 650 BP), and Marana (circa 650 BP to Contact AD 1770). Each period is characterized by a series of temporally distinct projectile point types.

Archaeological evidence indicates that during the Lake Mojave period, settlement in the Owens Valley was concentrated along the shorelines of inland lakes or playas. Little is known about the subsistence strategies during this period, although it is assumed that hunting was a primary focus. The presence of projectile points and the relative lack of ground stone tools indicative of plant processing lend credence to this view. Faunal assemblages at several sites of this period have also supported this assumption, with evidence for both small (e.g., lagomorph) and large (e.g., artiodactyl) animal exploitation.[23,24] As with the Paleoindian period, however, the presence of Lake Mojave period sites near Pleistocene and Early Holocene lakes suggest a diverse range of plant and animal resources may have been utilized.

Dramatic environmental changes occurred in the region in the following Little Lake period. Owens Lake cores and surface data indicate that drought conditions were prevalent in the Owens Lake basin during this period and the lake itself was shallow and saline.[25] The few Little Lake period sites that have been recorded in the Owens Valley indicate temporary or seasonal occupations by small groups of people that practiced a more generalized subsistence strategy focused on the hunting of large and small game and the collection on plant resources.

Use of the Owens Valley area by prehistoric peoples intensified in the Newberry and Haiwee periods. Archaeological data indicate the establishment of large seasonally occupied villages in the Newberry period, with a corresponding increase in population and social complexity. Although

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[22] Dillon, B.D. 2002. "California Palaeoindians: Lack of Evidence, or Evidence of a Lack?" In *Essays in California Archaeology: A Memorial to Franklin Fenenga*, ed. W.J. Wallace and F.A. Riddell, pp. 110–128. Berkeley, CA: Contributions of the University of California Archaeological Research Facility No. 60, Table 1.

[23] Basgall, M.E. 2000. "The Structure of Archaeological Landscapes in the North-Central Mojave Desert." In *Archaeological Passages: A Volume in Honor of Claude Nelson Warren*, ed. J.S. Schneider, R.M. Yohe II, and J.K. Gardner. Hemet, CA: Western Center for Archaeology and Paleontology, Publications in Archaeology.

[24] Basgall, M.E., and M.C. Hall. 1994. "Perspectives on the Early Holocene Archaeological Record of the Mojave Desert." In *Kelso Conference Papers 1987–1992, A Collection of Papers and Abstracts from the First Five Kelso Conferences on the Prehistory of the Mojave Desert*, ed. G. Dicken Everson and Joan S. Schneider. Occasional Papers in Anthropology 4. Bakersfield, CA: California State University, Bakersfield, Museum of Anthropology.

[25] Bacon, S, N., R. M. Burke, S. K. Pezzopane, and A. S. Jayko. 2006. Last Glacial Maximum and Holocene Lake Levels of Owens Lake, eastern California, U.S.A. *Quaternary Science Reviews* 25:1264-1282.

hunting continued to be an important economic pursuit, the proliferation in the occurrence and diversity of ground stone artifacts at Newberry and Haiwee period sites suggest the more intensive use and processing of plant foods.[26,27] Introduction of the bow and arrow occurred during the Haiwee period around AD 500,[28] which may also mark the expansion of the Numic-speaking groups emanating from southeastern California. Finally, the Marana period is marked by a decrease in the size of annual foraging ranges, with the inhabitants of the Owens Valley adopting a more sedentary way of life. This is evidenced by the appearance of continuously occupied, valley-floor villages; these are often associated with satellite villages that served as bases for the procurement of specific resources such as pinyon, ricegrass, or alpine plants.[29]

B. Historic Context

The earliest Euro-Americans to visit the Owens Valley were probably mountain men and prospectors. Peter Skene Ogden, a Canadian fur trapper, traveled into Owens Valley and south along the eastern edge of the Sierra Nevada Mountains while exploring for the Hudson's Bay Company in 1829.[30] Joseph Reddeford Walker, also a fur trapper, traveled to the Owens Valley in 1834. During a later expedition through California in 1845, John Fremont named the Owens Valley after his traveling companion, Dick Owens.[31] One of the earliest surveys of the Owens Valley was conducted in 1855–1856 by Henry Washington and A.W. von Schmidt, who were sent by the United States Land Office and the State of California Surveyors Office.[32]

Substantial settlement of the Owens Lake region by Euro-Americans began in 1861 when Barton and Alney McGee introduced a small herd of cattle and built a log cabin in the area that would later become the town of Lone Pine.[33] In the following decade, the establishment of mining and soda extraction industries caused a number of towns, including Keeler, to spring up around Owens Lake. Silver mining was one of the earliest industries established in the Owens Valley. By the turn of the century, however, precious metal mining had given way to the large-scale commercial production and extraction of mineral resources from Owens Lake. In 1885, the Inyo Development Company established a soda ash plant in an area located approximately 1 mile northwest of the

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[26] Basgall, M.E., and K.R. McGuire. 1988. *The Archaeology of CA-INY-30: Prehistoric Culture Change in the Southern Owens Valley, California*. Prepared by: Far Western Anthropological Research Group, Inc., Davis, CA. Prepared for: California Department of Transportation, Bishop, CA.

[27] Bettinger, Robert L. 1999. From traveler to processor: Regional trajectories of hunter–gatherer sedentism in the Inyo-Mono region, California. In *Settlement Pattern Studies in the Americas, Fifty Years Since Viru,* ed. Billman, B. R., and Feinman, G. M. Smithsonian Institution Press, Washington, DC, pp. 39–55.

[28] Yohe, R.M. 1998. "The Introduction of the Bow and Arrow and Lithic Resource Use at Rose Spring (CA-INY-372)." *Journal of California and Great Basin Anthropology*, *20*: 26–52.

[29] Bettinger, Robert L. 1999. From traveler to processor: Regional trajectories of hunter–gatherer sedentism in the Inyo-Mono region, California. In *Settlement Pattern Studies in the Americas, Fifty Years Since Viru,* ed. Billman, B. R., and Feinman, G. M. Smithsonian Institution Press, Washington, DC, pp. 39–55.

[30] Dictionary of Canadian Biography. 2013. Peter Skene Ogden. Accessed online on September 4, 2013 at: http://www.biographi.ca/en/bio.php?id_nbr=4109

[31] Wilke, P.J., and H.W. Lawton, eds. 1976. *The Expedition of Capt. J. W. Davidson from Fort Tejon to the Owens Valley in 1859*. Socorro, NM: Ballena.

[32] Wilke, P.J., and H.W. Lawton, eds. 1976. *The Expedition of Capt. J. W. Davidson from Fort Tejon to the Owens Valley in 1859*. Socorro, NM: Ballena.

[33] Jones and Stokes. 2007. *Cultural Resources Inventory of Two Parcels in the Moat and Row Testing Area, Owens Lake Dust Mitigation Program, Inyo County, California*, pp. 12. Prepared for: City of Los Angeles Department of Water and Power.

town of Keeler.[34] At their height, the facilities produced 20 tons of soda ash per day. The company was dissolved in 1920, with the plant sold to the California Alkali Company.[35]

In 1865, a Mexican-American named Pablo Flores discovered the largest silver strike in California at Cerro Gordo (Fat Hill). The Cerro Gordo mines were located on the western slope of Buena Vista Peak in the southern Inyo Mountains, overlooking the eastern shore of Owens Lake.[36] In 1866, Mortimer W. Belshaw, a mining engineer, and his partner Adbner B. Elder came from San Francisco and started the Union Mining Company by staking claims at Cerro Gordo.[37] Ultimately, the Cerro Gordo mines produced over 15 million dollars' worth of silver ore.

Several distinct transportation industries, including trams, mule teams, boats, and railroads, played important roles in the industrial and economic histories of the Owens Lake region. The first three modes of transportation were needed to efficiently move raw ore from the silver mines in the Inyo Mountains to smelting facilities situated along the lakeshore. The fourth mode included the Southern Pacific and Carson & Colorado railroads, which served to transport silver bullion and other mining products from the Owens Valley to commercial centers in California and Nevada.[38,39] The construction of the Carson & Colorado Railroad was completed in 1883 with the rail line running from Mound House, Nevada to Keeler. The Carson & Colorado Railroad Company controlled the line until its sale to the Southern Pacific Railroad in 1900.

Salt was also an important resource in the history of the region. Extensive salt deposits were located in the Saline Valley east of the Inyo Mountains, approximately 13 miles northeast of the community of Swansea and 50 miles by dirt road from the community of Keeler. The property was originally operated by the Saline Salt Company, formed in 1911 by White Smith, and continued to operate under that name until 1913. From 1915 to 1919, the deposit was operated by the Owens Valley Salt Company. From 1926 through 1930, the property was operated by Sierra Salt Corporation with G.W. Russell as president and A.S. Henderson as the company's secretary.[40]
The salt was transported from the Saline Valley to the mill by an aerial tramway. The tramway was completed in 1913 and, in 1929, the tramway was refurbished by the Sierra Salt Corporation and extended 13 miles to the Tramway Station.[41] The Tramway Station was located northwest of Keeler adjacent to the Carson & Colorado Railroad siding, later operated by the Southern Pacific Railroad. The station included employee housing and a mill, which contained driers, vibrating screens,

[34] Jones and Stokes. 2007. *Cultural Resources Inventory of Two Parcels in the Moat and Row Testing Area, Owens Lake Dust Mitigation Program, Inyo County, California*, Figure 8. Prepared for: City of Los Angeles Department of Water and Power, Los Angeles, CA.

[35] Hamilton, F. 1920. *Seventeenth Annual Report of the State Mineralogist*. Volume XVII. Sacramento, CA: California State Mining Bureau.

36 DeDecker, M. 1966. *Mines of Eastern Sierra*, pp. 57. Glendale, CA: La Siesta Press.

37 Nadeau, R. 1958. *Ghost Towns and Mining Camps of California*, pp. 88. Los Angeles, CA: The Ward Ritchie Press.

[38] Kahrl, W. 1982. *Water and Power*. Berkeley, CA: University of California Press.

[39] Due, J. 1951. "The Carson and Colorado Railroad." *Economic Geography*, *27*(3): 251–267.

40 Bradey, W. 1938 *Thirty-fourth Annual Report of the State Mineralogist*. Volume XXXIV. California State Mining Bureau, Sacramento, CA.

41 Bradey, W. 1938 *Thirty-fourth Annual Report of the State Mineralogist*. Volume XXXIV. California State Mining Bureau, Sacramento, CA.

packing equipment and automated weight scales.[42] Due to high operating costs, the tramway ceased operations in 1933.[43]

Another important development in the history of the Owens Valley area was the construction of the Los Angeles Aqueduct. In the early 1900s, city leaders recognized that the water needs of the growing population of Los Angeles had exceeded the capacity of local sources. In 1904, the Owens Valley was identified as a likely source for additional water. After obtaining necessary water and land rights and approving a bond measure to fund construction, the City of Los Angeles began work in 1908 on the 233-mile-long aqueduct. Becoming the country's largest municipal water system at the time, the Los Angeles Aqueduct was completed in 1913. In order to divert the full amount of authorized water, the City of Los Angeles later constructed a second aqueduct, completed in 1970, which largely parallels the course of the First Los Angeles Aqueduct.

The diversion of water from the Owens River and other tributary creeks by the Los Angeles Aqueduct caused a rapid drop in the water level of Owens Lake. By 1924, the lake was virtually dry, resulting in the exposure of large deposits of solids salts, brines, and other minerals on the playa.

C. Regional Ethnography

The Owens Valley area was primarily inhabited by the Owens Valley Paiute during prehistoric times; by the time of Euro-American contact, Western Shoshone populations were also present in the area. Currently, descendants of both groups still live in the valley, mostly within the reservations. Four reservations are located in the Owens Valley north of Owens Lake—Lone Pine, Big Pine, Fort Independence, and Bishop. One of the earliest references to the Owens Valley Paiute and the Shoshone is that by Kroeber;[44] however, later ethnographic works by Steward[45,46,47] and Driver[48] have become the standard reference for these groups.

3.4.2.3 Records Search

A. Prior Research

A search for previously recorded cultural resources and investigations was conducted within a one mile buffer of the APE. The search included a literature review and a records search at the Eastern

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42 Bradey, W. 1938 *Thirty-fourth Annual Report of the State Mineralogist*. Volume XXXIV. California State Mining Bureau, Sacramento, CA.

43 Jones and Stokes. 1997. *Cultural Resources Inventory and Evaluation of Historic Resources on the Eastern Side of Owens Lake for the Great Basin Unified Air Pollution Control District*. Prepared by: Jones and Stokes, Sacramento, CA, pp. 19. Prepared for: Great Basin Unified Air Pollution Control District.

44 Kroeber, A.L. 1925. *Handbook of the Indians of California*. New York, NY: Dover, p. 556.

45 Steward, J.H. 1934. "Two Paiute Ethnographies." *University of California Publications in American Archaeology and Ethnology*, *33*(5): 423–438.

46 Steward, J.H. 1937. "Linguistic Distributions and Political Groups of the Great Basin Shoshoneans." *American Anthropologist*, *39*(4): 625–634.

47 Steward, J.H. 1938. "Basin Plateau Aboriginal Sociopolitical Groups." *Bureau of American Ethnology Bulletin*, *120*. Washington, DC.

48 Driver, H.E. 1937. "Cultural Element Distributions, VI: Southern Sierra Nevada." *University of California Anthropological Records*, *1*(2): 53–154.

Information Center (EIC) records search. Additional research was completed by BLM archaeologist Mr. Greg Haverstock, who conducted a search of the site files housed at the BLM Bishop Field Office and provided information on the cultural resources on BLM-administered portions of the proposed project / proposed action study area. Results of the record searches indicate that nine cultural resource inventories and one Phase II testing project have been previously undertaken within the project study area. A summary of each of these work efforts is provided below (Table 3.4.2.3-1, *Cultural Resources Investigations within the Study Area*).

TABLE 3.4.2.3-1
CULTURAL RESOURCES INVESTIGATIONS WITHIN THE STUDY AREA

Report No.	Year	Report Title	Author
IN-00063	1978	California Desert Program – Archaeological Sample Unit Records for Owens Valley Planning Unit	BLM
IN-00293	2003	Cultural Resource Survey for 2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan, Vols. I and II	Wells, Helen, Ancient Enterprises, Inc., Santa Monica, CA, for Sapphos Environmental, Inc., Pasadena, CA
IN-00563	1997	Cultural Resources Inventory and Evaluation of the Historic Resources on the Eastern Side of Owens Lake for the Great Basin Unified Air Pollution Control District	Jones and Stokes Associates
IN-00592	2002	Inventory and Evaluation of 18 Sites on the Eastern Margin of the Owens Lake Playa, Inyo County, California	Jones and Stokes Associates
IN-00639	2004	Cultural Resources Inventory Report	McCormick, Erica D., BLM, Bishop, CA
IN-00641	2002	Archaeological Survey Report for a Monument on State Route 136, Inyo County, California	Jones and Stokes Associates
IN-00642	2005	Cultural Resources Inventory of a Proposed Temporary Road at Swansea, Inyo County, California	Burton, Jeffry F., Trans-Sierran Archaeological Research
IN-00658	2003	Research Design for Limited Phase II Testing at the Keeler Dunes Sites, Owens Valley, California	Halford, F. Kirk, BLM, Bishop, CA
IN-00735	2005	Results of Limited Phase II Testing at the Keeler Dunes Sites, Owens Valley, California	Halford, F. Kirk, and Kim Carpenter, Far Western Anthropological Research Group, Inc.
IN-00834	2008	Cultural Resources Inventory Report	Haverstock, Greg, BLM, Bishop, CA
IN-00928	2010	Cultural Resources Inventory of Caltrans District 9 Rural Conventional Highways in Inyo, Eastern Kern, Mono, and Northern San Bernardino Counties	Seil, Libby, Bryan Larson, Joseph Freeman, Jill Braden, Lindsay Hartman, Laura Leach-Palm, Paul Brandy, and Jay King, Far Western Anthropological Research Group, Inc.

Note: IN-00658 and IN-00735 reports are part of the same Phase II testing project.

B. Previously Recorded Resources

A total of 39 cultural resources were previously identified within the study area. These include 27 archaeological sites, 10 archaeological isolates, and 2 buildings/structures (Table 3.4.2.3-2, *Previously Recorded Cultural Resources Located within the Proposed Project / Proposed Action Study Area*). Only two of these cultural resources—P-14-7840/CA-INY-6503 and P-14-7841/CA-INY-6502—are located within the APE of the proposed project / proposed action. Recorded in 2003 as part of a cultural resource survey for the LADWP Keeler Dunes Mining project, the remains consist of concentrations of rock cairns surrounded by a diffuse flaked stone scatter; several cairns had associated artifact assemblages that contained flaked and ground stone tools, pottery, shells, and animal bone.[49] A small number of historic artifacts were also noted, including a bullet, bottle glass fragments, clothing debris, and butchered animal bone; these remains range in date from the late 1800s to modern times.

Limited Phase II testing was completed on the cairn features at CA-INY-6502 and CA-INY-6503 by BLM and Far Western Anthropological Research Group, Inc.[50] Given the form of the cairns and associated artifacts, it was originally postulated that the features may mark human burials. To determine if the cairns were used as grave markers, seven rock piles were excavated at the sites (six at CA-INY-6502 and one at CA-INY-6503). Only one cairn at CA-INY-6503 was found to be in direct association with human remains. Archaeological work at the sites was halted in response to the discovery of the human remains and concerns by local Native American groups. Due to their cultural and archaeological value, both sites were determined as eligible for listing on the NRHP.[51]

Sand movement within the Keeler Dunes area since 2003 has revealed additional archaeological deposits associated with CA-INY-6502 and CA-INY-6503. Exposure of these previously undocumented cultural remains prompted a revisit in 2009 by BLM archaeologist Mr. Greg Haverstock.[52] An additional 63 cairn features, which were concentrated in several discrete loci, were identified in the dune complex during the revisit. As a result, the site boundaries of CA-INY-6502 and CA-INY-6503 were expanded and merged into one large site (referred to as CA-INY-6502). During subsequent visits to the site, Mr. Haverstock noted cremated and articulated human skeletal remains eroding out of the dune complex, suggesting that the site was used as a prehistoric mortuary location. Mr. Haverstock has hypothesized that CA-INY-6502 may be part of a series of such mortuary sites that line the prehistoric shore of Owens Lake, collectively referred to as the Southern Owens Valley Mortuary Complex.[53] This complex also includes the site of P-14-7843/CA-INY-6505, which is located just outside of the proposed project / proposed action study area.

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[49] Halford, F. Kirk, and Kim Carpenter. 2005. *Results of Limited Phase II Testing at the Keeler Dunes Sites, Owens Valley, California*. Cultural Resource Project CA-170-03-11. Prepared by: Far Western Anthropological Research Group, Inc., Davis, CA.

[50] Halford, F. Kirk, and Kim Carpenter. 2005. *Results of Limited Phase II Testing at the Keeler Dunes Sites, Owens Valley, California*. Cultural Resource Project CA-170-03-11. Prepared by: Far Western Anthropological Research Group, Inc., Davis, CA.

[51] Halford, F. Kirk, and Kim Carpenter. 2005. *Results of Limited Phase II Testing at the Keeler Dunes Sites, Owens Valley, California*. Cultural Resource Project CA-170-03-11. Prepared by: Far Western Anthropological Research Group, Inc., Davis, CA.

[52] Primary Site Record for CA-INY-6502 and CA-INY-6503 (Update). n.d. Record on file at the Bureau of Land Management, Bishop Field Office, Bishop, CA.

[53] Haverstock, Greg. 17–20 March 2010. "Stones and Bones: The Southern Owens Valley Mortuary Complex." Paper presented at the Society for California Archaeology, 2010 annual meeting, Riverside, CA.

TABLE 3.4.2.3-2
PREVIOUSLY RECORDED CULTURAL RESOURCES LOCATED WITHIN THE PROPOSED PROJECT / PROPOSED ACTION STUDY AREA

Primary No.	Trinomial	Resource Type	Description	Within APE	Within Project Area	Within 1 Mile
P-14-273	CA-INY-273	Site	Prehistoric artifact scatter			X
P-14-320	CA-INY-320	Site	Prehistoric ceramic and lithic scatter			X
P-14-321	CA-INY-321	Site	Prehistoric artifact scatter			X
P-14-432	CA-INY-432	Site	Prehistoric petroglyph with bedrock mortar			X
P-14-451	CA-INY-451	Site	Prehistoric artifact scatter			X
P-14-452	CA-INY-452	Site	Prehistoric flaked and ground stone scatter			X
P-14-4820	CA-INY-4820H	Building	Historic Sierra Talc Mill			X
P-14-8421	CA-INY-6661H	Site	Historic Owens Lake Silver-Lead Company mill and smelter		X	
P-14-4822	CA-INY-4822H	Structure (Furnace)	Historic Owens Lake Silver-Lead Company furnace			X
P-14-5194	CA-INY-5058H	Site	Historic "End of Line" of the Carson & Colorado Railroad			X
P-14-5926		Isolate	Historic section of pipeline			X
P-14-5927		Isolate	Prehistoric lithic flakes			X
P-14-7147	CA-INY-6076	Site	Prehistoric lithic scatter			X
P-14-7148	CA-INY-6077	Site	Prehistoric lithic scatter			X
P-14-7567	CA-INY-6361	Site	Prehistoric lithic and ground stone scatter			X
P-14-7568	CA-INY-6362	Site	Prehistoric basalt quarry complex			X
P-14-7569	CA-INY-6363H	Site	Historic utility line			X
P-14-7570	CA-INY-6364	Site	Prehistoric lithic scatter			X
P-14-7571	CA-INY-6365	Site	Prehistoric lithic scatter and rock ring feature			X
P-14-7572	CA-INY-6366	Site	Prehistoric lithic and ground stone scatter			X
P-14-7573	CA-INY-6367	Site	Prehistoric lithic scatter			X
P-14-7603		Isolate	Prehistoric small lithic scatter			X
P-14-7604		Isolate	Prehistoric obsidian scraper			X
P-14-7605		Isolate	Prehistoric obsidian scraper			X
P-14-7606		Isolate	Three pieces of prehistoric obsidian debitage			X
P-14-7608		Isolate	Historic glass bottle fragment			X
P-14-7640		Isolate	Historic metal horseshoe			X

TABLE 3.4.2.3-2
PREVIOUSLY RECORDED CULTURAL RESOURCES LOCATED WITHIN THE PROJECT STUDY AREA, *CONTINUED*

Primary No.	Trinomial	Resource Type	Description	Within APE	Within Project Area	Within 1 Mile
P-14-7641		Isolate	Historic ceramic fragment			X
P-14-7840	CA-INY-6503	Site	Rock cairns with associated prehistoric and historic artifact scatters	X	X	
P-14-7841	CA-INY-6502	Site	Rock cairns with associated prehistoric and historic artifact scatters	X	X	
P-14-7842	CA-INY-6504	Site	Prehistoric lithic and ground stone scatter			X
P-14-7843	CA-INY-6505	Site	Rock cairns with associated prehistoric and historic artifact scatters			X
P-14-7851	CA-INY-6513H	Site	Historic Carson & Colorado Railroad			X
P-14-7852		Isolate	Historic glass bottle		X	
P-14-8281	CA-INY-6599	Site	Prehistoric lithic scatter			X
P-14-8385	CA-INY-6658H	Site	Historic Swansea Pier			X
P-14-8419	CA-INY-6659	Site	Prehistoric lithic scatter			X
P-14-8420	CA-INY-6660	Site	Prehistoric lithic scatter			X
P-14-10344		Site	Prehistoric lithic scatter			X

Note: P-15-7840/CA-INY-6503 and P-14-7841/CA-INY-6502 are now considered one cultural resource (CA-INY-6502).

3.4.2.4 FIELD SURVEY AND SITE RECORDATION RESULTS

The archaeological field investigations resulted in the recording of four archaeological sites and 17 isolates within the APE. These include a multicomponent site (KD Site 1), a section of the Old State Highway (KD Site 2), a small lithic scatter (BLM Site 1), and a previously undocumented section of the Carson & Colorado Railroad (P-14-7851/CA-INY-6513H). Additionally, Site CA-INY-6502 was recently updated in 2009 by BLM and was confirmed during the pedestrian survey. Additionally, the 17 isolates and one prehistoric lithic scatter site were also recorded by BLM Archaeologist (Mr. Greg Haverstock) during the February 2014 survey. Descriptions of each of these cultural resources are provided to support the characterization of the existing conditions and facilitate avoidance and minimization of impacts.

A. KD Site 1

KD Site 1 is a multicomponent site that measures 775 feet by 400 feet in area. The site consists of six historic period artifact concentrations, a historic road alignment, and two possible prehistoric cairns. The artifact concentrations are dominated by culinary artifacts with structural- and industrial-related items comprising relatively small proportions of the total artifact counts. Temporally diagnostic materials recovered from the concentrations indicate that the area was used as a trash dump beginning in the late 1800s with continued use into the 1960s. A 550-foot-long section of an abandoned dirt road was located in the western and central portions of KD Site 1. While an exact date of construction is not known, examination of historic maps of the area indicates that the road was likely built sometime between 1941 and 1951.[54,55]

The lack of evidence of residential structures in the immediate vicinity, as well as proximity of the area to historic roads, indicates that the historic period remains were the product of secondary dumping, in which accumulated trash from residential loci were transported to another location for deposition. The large quantity of artifacts found at the site suggests that the accumulated refuse was the result of multiple dumping episodes that took place over a relatively long period of time. Based on the potential of KD Site 1 to contribute important information about early-20th century life in the Owens Valley, KD Site 1 is recommended as eligible for inclusion on the NRHP under Criterion D.

The possible prehistoric cairn features consist of small clusters of rock, each of which contained at least one piece of ground stone. Although no other artifacts were associated with these features, a basalt core was found in close proximity. Based on the cultural and archaeological value of the possible cairn features, the prehistoric component of the site is also recommended as eligible for inclusion on the National Register under Criterion D.

B. KD Site 2

KD Site 2 consists of a section of the Old State Highway that runs from a point south of Keeler to a point north of Swansea along the northwestern edge of Owens Lake. Although most of the alignment is located outside of the proposed project / proposed action area, a short section of the road traverses the southwestern portion of the APE. The historic road segment is aligned in the southwest-to-northwest direction and measures appropriately 5.0 miles in length with an average width of 18 feet. An exact date of the construction of the road could not be ascertained. However, a historic map of the area dating to 1913 depicts a road running along this portion of the lakeshore between Lone Pine and Keeler just west of the Carson & Colorado Railroad line.[56]

Within the proposed project / proposed action area, the site is largely covered by active sand dunes and is no longer visible on the ground surface. Farther to the north, portions of the road have also been severely damaged by flooding that has resulted in the deposition of silt over the roadbed. Finally, a 0.5-mile-long section of the original road north of the proposed project / proposed action study area has been incorporated into the dust control measures on the lake bed.

The Old State Highway was once a significant transportation corridor within the Owens Valley. As such, it may be eligible for inclusion on the National Register under Criterion A, for its association with important events and trends that have contributed to the broad patterns of our history. However, the site's integrity has been significantly compromised by erosional processes and the realignment of portions of the roadway. Due to the loss of integrity of KD Site 2, the portion of this cultural resource within the proposed project / proposed action property is recommended ineligible for listing on the NRHP or CRHR.

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[54] Automobile Club of Southern California. 1941. *US395 US6 Map Section from Automobile Club of Southern California Mojave & Colorado Deserts*. Available at: http://www.historicalroadmaps.com/CaliforniaPage/DeathValleyPage/image2.html

[55] U.S. Geological Survey. 1951. *15-Minute Topographic Map of Keeler, CA*. Denver, CO.

[56] U.S. Geological Survey. 1913 (reprinted 1921) 1:250,000 Series Ballarat, California, Topographic Quadrangle.

C. BLM Site 1

This site consists of a small lithic scatter that measure roughly 3 meters in diameter. The cultural constituents of this site include several pieces of cryptocrystalline silicate lithic materials (two cores, flakes, and shatter). This site is contained entirely within the buffer of Staging Area 3. Due to the limited data potential this site provides, this cultural resource within the proposed project / proposed action property is recommended as ineligible for listing on the NRHP or CRHR.

D. P-14-7851/CA-INY-6513H

The update to this historic archaeological Department of Parks and Recreations (DPR) site form consists of a previously unrecorded segment of the Carson & Colorado Railroad located in the southwestern portion of the proposed project / proposed action area and APE. A 706-foot-long segment of the railroad berm was initially recorded in 2005 in the area southeast of Swansea.[57] Three additional segments of the Carson & Colorado Railroad, totaling 669 feet in length, were recorded in the proposed project / proposed action area and APE. While the railroad line was, in the past, a continuous alignment the surrounding dunes have now covered portions of the alignment and buried segments under several feet of sand. The portions of CA-INY-6513H located within the project area consist of a raised rail bed covered with gravel and small cobbles. The berm in these areas measures approximately 14 feet in width with a height ranging from 1 to 2 feet above the surrounding ground surface. Associated artifacts include rusted railroad spikes, metal ties, and fragments of wooden rail ties.

The Carson & Colorado narrow gauge railway was constructed between 1880 and 1883 and ran from Mound House, Nevada to Keeler. Although the railway was primarily built for ore transport, other cargo was also hauled on the line including timber, fuel, and agricultural goods.[58] The Carson & Colorado Railroad Company controlled the line until its sale to the Southern Pacific Railroad in 1900. The railroad saw regular use until 1920s, when the construction of the Los Angeles Aqueduct and diversion of water from Owens Lake took a significant toll on agricultural production in the area and salt mining on Owens Lake. Use of the rail line steadily decreased in the following decades until the line was abandoned and the rails were pulled in 1960.[59]

A previous evaluation of CA-INY-6513H conducted in 2006 by JRP Historical Consulting determined that the site did not meet the criteria for listing either on the NRHP or the CRHR due to a lack of integrity.[60] The three segments of the railroad recorded by Sapphos Environmental, Inc. within the proposed project / proposed action area exhibit a similar level of integrity as the previously documented sections of the railroad alignment. Given this, the portion of the site located within the proposed project / proposed action area is recommended not eligible for listing on the NHRP or CRHR.

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[57] Burton, Jeffery F. 2005. *Cultural Resources Inventory of a Proposed Temporary Road at Swansea, Inyo County, California*. Manuscript on file, Barnard Construction, Inc., Bozeman, Montana.

[58] California Department of Parks and Recreation. 2006. Update to Primary Record for CA-INY-6513H. Site form on file at the Eastern Information Center, University of California, Riverside, CA.

[59] Turner, George. 1965. *Narrow Gauge Nostalgia*. Harbor City, CA: J-H Publications.

[60] California Department of Parks and Recreation. 2006. Update to Primary Record for CA-INY-6513H. Site form on file at the Eastern Information Center, University of California, Riverside, CA.

E. P-14-7841/CA-INY-6502 and P-14-7841/6502

The sites were recorded in 2003 as part of a cultural resource survey for the LADWP Keeler Dunes Mining project. The remains consist of concentrations of rock cairns that are surrounded by a diffuse flaked stone scatter; several cairns had associated artifact assemblages that contained flaked and ground stone tools, pottery, shell, and animal bone.[61] A small number of historic artifacts were also noted at the two sites including a bullet, bottle glass fragments, clothing debris, and butchered animal bone; these remains range in date from the late 1800s to modern times. Subsurface testing has been conducted at CA-INY-6502 and CA-INY-6503 by BLM and Far Western Anthropological Research Group, Inc. (Far Western).[62] One cairn at CA-INY-6503 was found to be in direct association with sensitive cultural materials. Due to their cultural and archaeological value, both sites were determined to be eligible for listing under Criterion D on the NRHP.[63]

Sand movement within the Keeler Dunes area since 2003 has revealed additional archaeological deposits associated with CA-INY-6502 and CA-INY-6503. The exposure of these previously undocumented cultural remains prompted a revisit to the sites in 2009 by BLM archaeologist Mr. Greg Haverstock.[64] At which time, an additional 63 cairn features, which were concentrated in several discrete loci, were identified in the dune complex during the revisit. As a result of these findings, the site boundaries of CA-INY-6502 and CA-INY-6503 were expanded and merged into one large site (therein referred to as CA-INY-6502). During subsequent visits to the site, Mr. Haverstock sensitive cultural materials eroding out of the dune complex, suggesting that the site was used as a prehistoric mortuary location. Mr. Haverstock has hypothesized that CA-INY-6502 may be part of a series of such mortuary sites that line the prehistoric shore of Owens Lake, collectively referred to as the Southern Owens Valley Mortuary Complex.[65] This complex also includes the site of P-14-7843/CA-INY-6505, which is located just outside of the proposed project / proposed action area.

F. ISOLATES

Seventeen (17) archaeological isolates were identified during field surveys conducted under the supervision of BLM Archaeologist (Mr. Greg Haverstock). Sixteen (16) historic isolates were recorded within the area of Staging Area 3 and one prehistoric isolate was recorded in a proposed access route to Staging Area 2. Mr. Greg Haverstock recorded all resources in the field and copies of his findings are on file at the BLM Bishop Field Office. The 16 historical isolated listed below are associated with the railroad, which has been determined ineligible through Section 106 (per Mr. Greg Haverstock). As a result, these 16 historical isolates are ineligible for NRHP and CRHR.

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[61] Halford, F. Kirk and Kim Carpenter. 2005. *Results of Limited Phase II Testing at the Keeler Dunes Sites, Owens Valley, California*. Cultural Resource Project: CA-170-03-11. Report prepared by Far Western Anthropological Research Group, Inc., Davis, CA.

[62] Halford, F. Kirk and Kim Carpenter. 2005. *Results of Limited Phase II Testing at the Keeler Dunes Sites, Owens Valley, California*. Cultural Resource Project: CA-170-03-11. Report prepared by Far Western Anthropological Research Group, Inc., Davis, CA.

[63] Halford, F. Kirk and Kim Carpenter. 2005. *Results of Limited Phase II Testing at the Keeler Dunes Sites, Owens Valley, California*, pp. 1. Cultural Resource Project: CA-170-03-11. Report prepared by Far Western Anthropological Research Group, Inc., Davis, CA.

[64] Primary Site Record for CA-INY-6502 and CA-INY-6503 (Update). Record on file at the Bureau of Land Management, Bishop Field Office, Bishop, California.

[65] Haverstock, Greg. March 17-20, 2010. Stones and Bones: The Southern Owens Valley Mortuary Complex. Paper presented at the Society for California Archaeology, 2010 Annual Meeting. Riverside, CA.

ISO-017 is an elongated rock feature, which is recommended ineligible for NRHP and CRHR. A summary of the isolates is provided below in Table 3.4.2.4-1

TABLE 3.4.2.4-1
BLM RECORDED ARCHAEOLOGICAL ISOLATES WITHIN THE APE

Resource ID	Period	Description	Eligibility Recommendations
BLM ISO-1	Historic	Brown colored, thick walled, mold blown bottle	Recommended Not Eligible
BLM ISO-2	Historic	2 fragments of broken ceramic electrical insulator	Recommended Not Eligible
BLM ISO-3	Historic	Metal fragments, log bolt, large bolt	Recommended Not Eligible
BLM ISO-4	Historic	Sheet metal	Recommended Not Eligible
BLM ISO- 5	Historic	Steel pipe, 6 fragments,	Recommended Not Eligible
BLM ISO-6	Historic	2 fragments of broken ceramic electrical insulator	Recommended Not Eligible
BLM ISO-7	Historic	Steel sheet with bolt holes and opening, riveted	Recommended Not Eligible
BLM ISO- 8	Historic	Steel wire, 2 gauges, fragments, 9 segments	Recommended Not Eligible
BLM ISO-9	Historic	Ceramic electrical insulator fragments	Recommended Not Eligible
BLM ISO-10	Historic	Telephone pole cross member with insulated post	Recommended Not Eligible
BLM ISO-11	Historic	Karo syrup bottle fragment, clear glass (1968-present)	Recommended Not Eligible
BLM ISO-12	Historic	Gallon and 1/2 gallon wine jugs clear glass	Recommended Not Eligible
BLM ISO-13	Historic	Solarized brown Clorox bottle neck and rim (1958-present), and glass ketchup bottle, octagonal with solarized clear glass	Recommended Not Eligible
BLM ISO-14	Historic	Brown Duraglas been bottle(1947)	Recommended Not Eligible
BLM ISO-15	Historic	Brown Duraglas been bottle(1941)	Recommended Not Eligible
BLM ISO-16	Historic	Wire sand fence (8 strands)	Recommended Not Eligible
BLM ISO-17	Prehistoric	Elongated rock cairn	Recommended Not Eligible

3.4.2.5 NATIVE AMERICAN COORDINATION

Native American coordination was undertaken to fulfill the District's requirements, pursuant to CEQA, for consideration of Native American cultural resources. Records searches for the proposed project / proposed action included a request for a search of the Sacred Lands File maintained by the NAHC. This request was made of the NAHC early in the planning process in August 2011.[66] The results of the search would be an indication of the presence of known Native American cultural resources in the proposed project / proposed action's study area. A written response to the District's inquiry was received by Sapphos Environmental, Inc. on August 31, 2011, advising that the Sacred Lands File indicated that no Native American cultural resources have been identified within one mile of the proposed project / proposed action area.[67] However, the NAHC did indicate that the Keeler Dunes locale is known as a culturally sensitive area and recommended that additional coordination be undertaken with local Native American groups and individuals on the matter. As a result of this recommendation, Sapphos Environmental, Inc., acting on behalf of the District, sent letters to 10 Native American contacts classified by the NAHC as potential sources of information related to the presence of sacred sites or human remains in the vicinity of the project study area. This outreach resulted in responses from Matthew Nelson, a Tribal Historic Preservation Officer and NAGPRA Coordinator of the Bishop Paiute Tribe, who noted that the Keeler Dunes and foothills of the Inyo Mountains east of Owens Lake contained extremely culturally sensitive areas.[68] A second response was received from Kathy Fabunan, a tribal administer for the Lone Pine Paiute-Shoshone Tribe, who forwarded the request for information to the tribe's Cultural Committee for comment. Sapphos Environmental, Inc. Native American Coordination efforts was completed at this stage and transferred to BLM, who is responsible for formal Section 106 consultation with the Tribes. Refer to Section 3.4.2.6, *Native American Consultation* (below), for details regarding the Section 106 consultation process to date.

Although a review of the available historic maps for the area indicate that no formal cemeteries are located within the proposed project / proposed action study area,[69,70,71,72] documentation on file at the EIC and at the BLM Bishop Field Office indicate Native American burials are present in the proposed project / proposed action study area at archaeological site P-14-7841/CA-INY-6502 (originally recorded as P-14-7841/CA-INY-6502 and P-14-7840/CA-INY-6503).

As stated previously, limited Phase II testing of the rock cairns at CA-INY-6502 identified one feature that was associated with human remains.[73] The results of the archaeological investigation conducted at CA-INY-6502 suggest that the site was used as a prehistoric burial locale and could

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[66] Backes, Clarus, Sapphos Environmental, Inc., Pasadena CA. 24 August 2011. Letter to Larry Myers, Native American Heritage Commission, Sacramento, CA.

[67] Singleton, Dave, Native American Heritage Commission, Sacramento, CA. 31 August 2011. Letter response to Clarus Backes, Sapphos Environmental, Inc., Pasadena, CA

[68] Nelson, Matthew, Tribal Historic Preservation Officer and NAGPRA Coordinator, Bishop Paiute Tribe, Bishop, CA. 8 December 2011. Email response to Clarus Backes, Sapphos Environmental, Inc., Pasadena, CA.

[69] U.S. Geological Survey. 1987. *7.5-Minute Series, Dolomite, California, Topographic Quadrangle*. Denver, CO.

[70] U.S. Geological Survey. 1987. *7.5-Minute Series, Owens Lake, California, Topographic Quadrangle*. Denver, CO.

[71] U.S. Geological Survey. 1987. *7.5-Minute Series, Keeler, California, Topographic Quadrangle*. Denver, CO.

[72] U.S. Geological Survey. 1987. *7.5-Minute Series, Cerro Gordo Peak, California, Topographic Quadrangle*. Denver, CO.

[73] Halford, F. Kirk, and Kim Carpenter. 2005. *Results of Limited Phase II Testing at the Keeler Dunes Sites, Owens Valley, California*. Cultural Resource Project: CA-170-03-11. Prepared by: Far Western Anthropological Research Group, Inc., Davis, CA.

be part of a larger mortuary complex that lined the prehistoric shore of Owens Lake. According to BLM (Mr. Greg Haverstock) there have been two other discoveries (on file with BLM), in which human remains were identified, and found to be eroding out of the dunes, within this site.[74] See Section 3.4.2.3 B *Previously Recorded Resources* for more details regarding the investigation efforts and results.

3.4.2.6 NATIVE AMERICAN CONSULTATION

The BLM is responsible for formal consultation with interested Native American tribes and individuals pursuant to Section 106, consistent with the requirements of NEPA. The Section 106 consultation process was initiated by the BLM in October 2011, and at that time included BLM, SHPO, and Tribal representatives as consulting parties. In November 2013, new irrigation alternatives were identified by the District and discussed with BLM. As a result of these discussions, the BLM reinitiated the Section 106 consultation process (December 2013) to then include the BLM, SHPO, Tribal representatives, and the District. Alternatives 4 and 5 were developed as a result of the second Section 106 consultation efforts. Alternative 4 was added to eliminate the need for water tanks and provide direct delivery of water to the temporary irrigation system. Alternative 5 was added to eliminate water tanks and water trucks, by providing water delivery directly from the Keeler Community Service District well via pipeline. Alternatives 3, 4, and 5 provide for hand watering areas with cultural sensitivity (less 15 percent). Additionally, the proposed project / proposed action description was revised to include Native American participation in vegetation planting within cultural sensitive areas. As part of the Section 106 consultation process, the BLM sent letters and organized meetings and field visits with tribal representatives to discuss the proposed project / proposed action and alternatives to obtain their comments and concerns about the proposed project / proposed action and alternatives. A summary of the tribal consultation efforts undertaken by the BLM is provided in Table 3.4.2.6-1, *Summary of Native American Consultation Efforts for the Proposed Project / Proposed Action*).

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[74] Haverstock, Greg, Bureau of Land Management Bishop Field Office, Bishop, CA. 14 March 2014. Comment at galley proof meeting with Sapphos Environmental, Inc. and the Great Basin Unified Air Pollution Control District, Pasadena, CA, and Bishop, CA.

TABLE 3.4.2.6-1
SUMMARY OF NATIVE AMERICAN CONSULTATION EFFORTS FOR THE PROPOSED PROJECT / PROPOSED ACTION

Native American Group	Point of Contact	Date	Method of Consultation	Topic of Consultation
Lone Pine	Chair: Joseph	10/24/11	Cert letter	Keeler Dunes—District proposal for dust control
Independence	Chair: Naylor	10/24/11	Cert letter	Keeler Dunes–District proposal for dust control
Big Pine	Chair: Moose	10/24/11	Cert letter	Keeler Dunes—District proposal for dust control
Timbisha	Chair; Gholson	10/18/11	Phone	Keeler Dunes—District proposal for dust control
Timbisha	Chair; Gholson	10/17/11	Letter	Keeler Dunes—District proposal for dust control
Lone Pine	THPO, CR Committee	11/5/2011	Meeting	Keeler Dunes—District proposal for dust control, DRECP
Lone Pine	Acting Chair, Mary Wuester, Kathy Bancroft, THPO	1/20/2012	Meeting and Field Trip to ODL cairns	DRECP, Keeler Dunes—District proposal for dust control
Big Pine	Bill Helmer, THPO; Danielle Gutteriez, T. Sec. The rest of the council did not attend.	2/21/2012	Meeting	Solar PEIS, DRECP, CASSP, Digital 395, Keeler Dunes Test, Owens Lake Planning, Bodie Vegetation Update
Lone Pine	Acting Chair, Mary Wuester, Kathy Bancroft, THPO	2/5/2014	Meeting	Keeler Dunes–District and BLM to discuss the proposed irrigation alternatives
Big Pine	Bill Helmer, THPO, Danelle Gutierrez, Vice Chair, Sally Manning, Environmental Director, Jacklyn Velazquez,	2/11/2014	Meeting	Keeler Dunes–District and BLM to discuss the proposed irrigation alternatives

Key: District = Great Basin Unified Air Pollution Control District

3.5 GEOLOGY AND SOILS

The analysis of geology and soils consists of a summary of the regulatory framework that guides the decision-making process and a description of the existing conditions at the proposed project / proposed action study area.

3.5.1 REGULATORY FRAMEWORK

3.5.1.1 FEDERAL

A. Federal Land Policy and Management Act

The Federal Land Policy and Management Act (FLPMA) provides the mandate to the BLM for the management of public lands and resources under its stewardship. The FLPMA authorizes the BLM to manage public lands to protect the quality of scientific, scenic, historical, archeological, and other values, and to develop "regulations and plans for the protection of public land areas of critical environmental concern." The FLPMA also charges the BLM with protecting "life and safety from natural hazards."

B. Bishop Resource Management Plan

The BLM is the predominant land owner in the Keeler Dunes area. The Keeler Dunes are located within the Owens Lake Management Area and South Inyo Management Area, two of nine management areas managed by the BLM pursuant to the Bishop Resource Management Plan (RMP).[1] The proposed DCMs would be implemented within the Owens Lake Management Area, with the exception of the KCSD well tank (Alternative 5), which is located within the South Inyo Management Area. The RMP provides planning direction for the future use of land in the Bishop Resource Area.

The BLM has standard operating procedures, consisting of specific guidelines that apply to soil resources:

- Limit vegetation removal and other surface disturbing activities to minimum required for project implementation. Require soil retaining structures or other special methods as needed to control erosion on steep slopes and unstable soils.
- Avoid the use of soil disturbing equipment or vehicles on wet, poorly drained or erosive soils.

3.5.1.2 STATE

The State of California Geological Survey (CGS; formerly California Division of Mines and Geology [CDMG]) identifies several earth resource issues that should be taken into consideration when evaluating whether the proposed project / proposed action would likely be subject to geologic hazards, particularly related to earthquake damage. These considerations include both the potential for existing geologic and soil conditions to pose a risk to the proposed project / proposed action and the

[1] U.S. Department of the Interior, Bureau of Land Management, Bakersfield District. 1993. *Bishop Resource Management Plan Record of Decision*. Bakersfield, CA.

potential for the proposed project / proposed action to result in an impact to the existing geologic and soils conditions by creating or exacerbating a geologic hazard.

The CGS establishes regulations related to geologic hazards (e.g., faulting, liquefaction, seismically induced landslides, and ground shaking) as they affect people and structures. These regulations include the Alquist-Priolo Earthquake Fault Zone (APEFZ) Act and Seismic Hazards Mapping Program (SHMP).

A. Alquist-Priolo Earthquake Fault Zoning Act of 1972

The CGS has delineated special study zones along known active or potentially active faults in California pursuant to the APEFZ Act of 1972.[2] The APEFZ Act (Chapter 7.5, Division 2, Public Resources Code, State of California, effective May 4, 1975) provides a statewide mechanism for reducing losses from surface fault rupture. The APEFZ Act promotes public safety by prohibiting siting of most structures for human occupancy across traces of active faults that constitute a hazard to structures from surface faulting or fault creep. In accordance with the APEFZ Act, the Office of State Geologist delineated Special Study Zones that encompass potentially and recently active. The state delegates the authority to local government to regulate development within APEFZs. Construction of habitable structures is not permitted over potential rupture zones. The proposed project / proposed action is not located within an identified APEFZ. There are three APEFZs within the Owens Lake area (Bartlett Quadrangle,[3] Lone Pine Quadrangle,[4] and Olancha Quadrangle[5]), all of which are located along the Owens Valley Fault Zone along the western side of Owens Lake. The closest APEFZ is over 5 miles from the proposed project / proposed action study area.

B. Seismic Hazards Mapping Act of 1990, PRC Section 2690–2699

The CGS has also identified Seismic Hazard Zones that are delineated in accordance with the SHMP of the Seismic Hazards Act of 1990.[6] The Seismic Hazards Mapping Act is "to provide for a statewide seismic hazard mapping and technical advisory program to assist cities and counties in fulfilling their responsibilities for protecting the public health and safety from the effects of strong ground shaking, liquefaction, landslides, or other ground failure and other seismic hazards caused by earthquakes." The proposed project / proposed action is not included on any existing Seismic Hazard Zone Maps.[7]

3.5.1.3 LOCAL

A. Inyo County General Plan

One of the five policies related to Geologic and Seismic Hazards in the Public Safety Element in the Inyo County General Plan and one policy from the Conservation / Open Space Element are applicable to the proposed project / proposed action:

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[2] *California Public Resources Code*, § 2621 et seq.: "Alquist-Priolo Earthquake Fault Zoning Act."

[3] State of California Special Studies Map. 1 January 1990. *Bartlett Quadrangle*. Revised Official Map. Sacramento, CA.

[4] State of California Special Studies Map. 1 January 1990. *Lone Pine Quadrangle*. Revised Official Map. Sacramento, CA.

[5] State of California Special Studies Map. 1 January 1990. *Olancha Quadrangle*. Revised Official Map. Sacramento, CA.

[6] *California Public Resources Code*, § 2690 et seq.: "Seismic Hazards Mapping Act."

[7] California Department of Conservation. Accessed 16 December 2011. *Seismic Hazards Zonation Program*. Available at: http://www.conservation.ca.gov/cgs/shzp/Pages/Index.aspx

- Policy S-2.1 Soil Erosion. Minimize soil erosion from wind and water related to new development

3.5.2 AFFECTED ENVIRONMENT

3.5.2.1 GEOLOGY

Inyo County is characterized by large mountain ranges and deep basins formed by successive tectonic episodes of uplift and downward movements. One of the prominent basins, the Owens Valley is a pull-apart, strike-slip basin formed by the relative uplift of the surrounding mountains and subsidence of the valley floor.[8] There are four major fault zones present in the southern portion of the Owens Valley: two of the fault systems underlie the Owens Valley floor, while the other two systems are generally located along the base of the Sierra Nevada and Inyo-White Mountains.[9] Movement along these faults can result in hazards such as liquefaction, ground shaking, landslides, and unstable soils. The Owens Valley forms the westernmost basin of the Great Basin physiographic province and collects a variety of sediments transported from the Sierra Nevada Mountains to the west and the Inyo Mountains to the east.[10]

Owens Lake has had a dynamic geologic history with open basin conditions and basin overflow prevalent during much of the Late Pleistocene with high stands reaching between approximately 3,756 feet (1,145 meters) and 3,805 feet (1,160 meters) above mean sea level (MSL).[11] Lower lake levels and closed-basin conditions have prevailed throughout most of the lake's past 15,000 years, such that there has been no natural transport of material out of the basin, either water or sediment, except through evaporation or wind transport.[12]

Geological research indicates that Owens Lake had a number of natural oscillations between approximately 27,000 calibrated years before present (cal yr BP) to the late 1800s resulting from climate changes.[13] Studies indicate the lake reached high stands between 24,000 and 23,730 cal yr BP; 15,700 and 15,000 cal yr BP; and 7,860 and 7,650 cal yr BP.[14,15] Drier periods were recorded between approximately 18,920 and 15,590 cal yr BP; at 11,200 cal yr BP; and between 6,500 and 4,400 cal yr BP.[16] Lake oscillations continued throughout the Late Holocene, and between 350 and 230 cal yr BP,

[8] Johnson et al. June 1999. *Characterization of the Owens Lake Basin Hydrology System Inyo County, California*. Prepared for: Great Basin Unified Air Pollution Control District. Bishop, CA. Available at: ftp://gbuapcd.org/HydroReports/Hydrology%20Summary%20Report.pdf

[9] Slemmons, D.B., Vittori, E., Jayko, A.S., Carver, G.A., Bacon, S.N. 2008. *Quaternary Fault and Lineament Map of Owens Valley, Inyo County, Eastern California*. Geological Society of America. Boulder, Colorado.

[10] Hunt, C.B. 1967. *Physiography of the United States*. San Francisco, CA: W.H. Freeman and Company.

[11] Bacon, S.N., R.M. Burke, S.K. Pezzopane, and A.S. Jayko. 2006. "Last Glacial Maximum and Holocene Lake Levels of Owens Lake, Eastern California, USA." *Quaternary Science Reviews*, 1–19.

[12] Soil and Water West, Inc. 25 September 2001. *Owens Lakebed Survey (Revised)*. Prepared by: Soil and Water West, Inc., P.O. Box 44666, Rio Rancho, NM. Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA.

[13] Bacon, S.N., R.M. Burke, S.K. Pezzopane, and A.S. Jayko. 2006. "Last Glacial Maximum and Holocene Lake Levels of Owens Lake, Eastern California, USA." *Quaternary Science Reviews*, 1–19.

[14] Bacon, S.N., R.M. Burke, S.K. Pezzopane, and A.S. Jayko. 2006. "Last Glacial Maximum and Holocene Lake Levels of Owens Lake, Eastern California, USA." *Quaternary Science Reviews*, 1–19.

[15] Orme, A.R, and A.J. Orme. 1993. "Late Pleistocene Oscillations of Lake Owens, Eastern California." *Geological Society of America Abstracts with Programs*, *25*: 129–130.

[16] Benson, L., Kashgarian, M., Rye, R., Lund, S., Paillet, F., and Smoot, J. 2002. "Holocene Multidecadal and Multicentennial Droughts Affecting Northern California and Nevada." *Quaternary Science Review*, *21*: 659–682.

records indicate that the lake may have dried into a playa.[17] The lake began its most recent desiccation period in the late 1800s due to water diversions within the Owens Valley and then complete desiccation by 1924 associated with diversion of the entire flow of the Owens River and its tributaries in to the Los Angeles Aqueduct.[18] By the mid-1920s, Owens Lake had become a dry playa, only to receive water intermittently from 1938 through 1986.[19]

The geomorphology of the proposed project / proposed action is characterized by aeolian, alluvial, lacustrine, and anthropogenic features (Figure 2.1.5.1-3, *Geomorphic Map of the Keeler Dunes Area*). The proposed project / proposed action study area consists mainly of active aeolian sand sheets and dunes and coppice and vegetated dunes overlying alluvial surfaces. Many of the geomorphologic features are modern, with aeolian and alluvial features formed as recent as the late 20th century.[20]

3.5.2.2 SEISMICITY

The proposed project / proposed action is located within a seismically active region. Potential hazards that can result from seismic activities include surface rupture, ground shaking, liquefaction, and landslides. According to surveys of the region, numerous faults cut across near-surface and surface material and are considered active or potentially active. Of the four national earthquake zones, ranging from 1 to 4 with 4 posing the largest danger, the Owens Valley is classified as a Seismic Zone 4.[21]

Four major fault zones occur in the Owens Lake area, trending roughly north-south to northwest-southeast. The Sierra Nevada Frontal Fault System, the westernmost fault zone, exists along the east side of the Sierra Nevada Mountains and includes the Keough, Birch Creek, Shepard Creek, Whitney Portal, Olancha, and Haiwee Sections.[22] This fault zone is not continuous along the entire length of the Sierra front, but is a complex system of faults and down-dropped blocks.

The second fault zone (from west to east) is the Owens Valley Fault Zone, in the middle of the Owens Valley north of the Alabama Hills, extending south along the west side of Owens Lake and terminating near the town of Olancha.[23] The third fault system, the Owens River Fault, is largely a strike-slip fault

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[17] Li, H-C., Bischoff, J.L., Ku, T.L., Lund, S.P., and Stott, L.D. 2000. "Climate Variability in East Central California during the Past 1000 Years Reflected by High Resolution Geochemical and Isotopic Records from Owens Lake Sediments." *Quaternary Research*, *54*: 189–197.

[18] Smith, G.I., and Bischoff, J.L., Editors. 1993. "Core O.L. 92 from Owens Lake, Southeast California." U.S. Department of the Interior, U.S. Geological Survey, Open File Report 93-683. Menlo Park, CA.

[19] Stine, S. 1994. *Late Holocene Fluctuations of Owens Lake, Inyo County, California*. Prepared for: Far Western Anthropological Research Group, Inc., Davis, CA.

[20] Bacon, S, and N. Lancaster. November 2012. Late Holocene Stratigraphy and Chronology of Keeler Dunes Area Final Report by the Desert Research institute to the Great Basin Unified Air Pollution Control District. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20E%20-%20Stratigraphy%20Chronology%20and%20Sand%20Source%20Analysis/Lancaster%20and%20Bacon%202012a_Late%20Holocene%20stratigraphy%20and%20chronology_Final20121116.pdf

[21] California Seismic Safety Commission. 2005. *Homeowner's Guide to Earthquake Safety*. Sacramento, CA. Available at: http://www.seismic.ca.gov/pub/CSSC_2005-01_HOG.pdf

[22] Slemmons, D.B., Vittori, E., Jayko, A.S., Carver, G.A., Bacon, S.N. 2008. *Quaternary Fault and Lineament Map of Owens Valley, Inyo County, Eastern California*. Geological Society of America. Boulder, Colorado.

[23] Slemmons, D.B., Vittori, E., Jayko, A.S., Carver, G.A., Bacon, S.N. 2008. *Quaternary Fault and Lineament Map of Owens Valley, Inyo County, Eastern California*. Geological Society of America. Boulder, Colorado.

zone that extends south-southeast along the Owens River north of Owens Lake through the Owens River delta and the center of Owens Lake Bed.[24]

The eastern side of Owens Valley is bounded by the Inyo-White Mountain Fault Zones along the western margin of the Inyo and White Mountains.[25] Both the Sierra Nevada and Owens Valley Fault Zones are capable of generating earthquakes with a magnitude of 8.0 or greater, which would impact the proposed project / proposed action study area. Historic earthquakes in this region include the 1872 Owens Valley earthquake along the Owens Valley Fault, with a magnitude of 7.6–8.0,[26] and the earthquake swarms of May 1980 in the Long Valley Caldera, which resulted in four magnitude 6.0 earthquakes in quick succession.[27,28]

Although there are three APFEZs designated along the western side of Owens Lake, there are no APEFZ faults mapped within the proposed project / proposed action study area.[29,30,31] Furthermore, the proposed project / proposed action study area is not delineated by the CGS under the Seismic Hazards Zonation Program (SHZP). This program assesses the effects of strong ground shaking, liquefaction, landslides, or other ground failure to provide a statewide program to assist cities and counties in fulfilling their responsibilities for protecting the public health and safety from the effects of strong seismic shaking and related ground failure.

3.5.2.3 GROUND SHAKING

Ground shaking is a potential seismic danger resulting from earthquakes that may occur in the region. Several factors contribute to the significance of ground shaking during an earthquake, including the proximity of the area to a fault or fault system, the depth of earthquake, the location of the epicenter, the magnitude of the earthquake, and the geologic substrate. Movement along any of the four fault zones in the region could result in ground shaking within the proposed project / proposed action study area. The study area is closest to the Inyo Mountain and Owens River Fault Zones, approximately 1.5 miles west of the Inyo Mountain Fault Zone and 3 miles east of the Owens River Fault Zone.[32]

All of California is at risk from seismic ground shaking, and as described previously, the Sierra Nevada and Owens Valley Fault Zones are both capable of generating earthquakes with a magnitude of 8.0 or greater. Despite this, the proposed project / proposed action study area is not delineated by the CGS as

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[24] Johnson et al. June, 1999. *Characterization of the Owens Lake Basin Hydrology System Inyo County, California*. Prepared for: Great Basin Unified Air Pollution Control District. Bishop, CA. Available at: ftp://gbuapcd.org/HydroReports/Hydrology%20Summary%20Report.pdf

[25] Slemmons, D.B., Vittori, E., Jayko, A.S., Carver, G.A., Bacon, S.N. 2008. *Quaternary Fault and Lineament Map of Owens Valley, Inyo County, Eastern California*. Geological Society of America. Boulder, Colorado.

[26] The true magnitude of the 1872 earthquake is not known but based on reports of the damage caused in buildings and landforms near the epicenter and the geographic extent of displacement along the fault strands and noticeable ground movement, the Richter scale magnitude is estimated to be between 7.6 to 8.0.

[27] Hill, D.P., Bailey, R.A., Sorey, M.L., Hendley, J.W., Stauffer, P.H. "Living With a Restless Caldera—Long Valley, California" U.S. *Geological Survey Fact Sheet 108-96*. Revised May 2000. Available at: http://pubs.usgs.gov/fs/fs108-96/

[28] California Seismic Safety Commission. 2005. *Homeowner's Guide to Earthquake Safety*. Sacramento, CA. Available at: http://www.seismic.ca.gov/pub/CSSC_2005-01_HOG.pdf

[29] State of California Special Studies Map. 1 January 1990. *Bartlett Quadrangle*. Revised Official Map. Sacramento, CA.

[30] State of California Special Studies Map. 1 January 1990. *Lone Pine Quadrangle*. Revised Official Map. Sacramento, CA.

[31] State of California Special Studies Map. 1 January 1990. *Olancha Quadrangle*. Revised Official Map. Sacramento, CA.

[32] Slemmons, D.B., Vittori, E., Jayko, A.S., Carver, G.A., Bacon, S.N. 2008. *Quaternary Fault and Lineament Map of Owens Valley, Inyo County, Eastern California*. Boulder, CO: Geological Society of America.

an APEFZ.[33] The proposed project / proposed action study area is not delineated by the CGS under the SHZP.[34]

3.5.2.4 SURFACE RUPTURE

Where earthquakes are large enough, or shallow enough, surface rupture can occur along the fault plane where it intersects the earth's surface. Geophysical surveys have revealed numerous fault strands on the bed of Owens Lake and surrounding areas, with most roughly following a northwest-southeast trend.[35] Despite the presence of faults in the region, the proposed project / proposed action study area is not delineated by the CGS as an APEFZ.[36] There are no recorded fault scarps in the proposed project / proposed action study area.[37]

3.5.2.5 LIQUEFACTION

Liquefaction occurs when saturated, cohesionless (low relative density) materials (usually sand or silty sand) are transformed from a solid to a near liquid state due to the increase in pore water pressure that can be caused by moderate to severe seismic ground shaking. In order for liquefaction to occur, the groundwater table must be close to the surface, the soil must be loosely packed, and ground shaking needs to be powerful enough to cause the soil to liquefy. The depth to groundwater in the proposed project / proposed action study area ranges from approximately 196 feet on the eastern border, east of SR 136, to within a few feet of the surface along the southwestern study area border. The soils in the proposed project / proposed action study area vary from loose gravels and sands to compact clays.[38] The conditions for liquefaction may be present along the historic shoreline, in the extreme southern portion of the proposed project / proposed action study area where the soils are finer texture and the groundwater is close to the surface. Due to the presence of coarse alluvial material over most of the rest of the proposed project / proposed action study area and the overall depth of the groundwater, the conditions for liquefaction over the rest of the proposed project / proposed action study area is considered to be low.

3.5.2.6 SUBSIDENCE

Subsidence is the gradual sinking of the earth's surface in a particular region. The ground in the Owens Valley is naturally subsiding through tectonic processes, but subsiding may also result from subsurface

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[33] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Alquist-Priolo Earthquake Fault Zone Maps. Available at: http://www.quake.ca.gov/gmaps/ap/ap_maps.htm

[34] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Seismic Hazard Zonation Program. Available at: http://www.conservation.ca.gov/cgs/shzp/Pages/index.aspx

[35] Neponset Geophysical and Aquilla Geosciences, 1997, Final Report, Phase 3 and 4Seismic Program, Owens Lake, Inyo County, California, prepared for the Great Basin Unified Air Pollution Control District. Bishop, CA.

[36] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Alquist-Priolo Earthquake Fault Zone Maps. Available at: http://www.quake.ca.gov/gmaps/ap/ap_maps.htm

[37] Slemmons, D.B., Vittori, E., Jayko, A.S., Carver, G.A., Bacon, S.N. 2008. *Quaternary Fault and Lineament Map of Owens Valley, Inyo County, Eastern California*. Geological Society of America. Boulder, Colorado.

[38] Bacon and Lancaster, 2012. Geomorphic Mapping of the Keeler Dunefield and Surrounding Areas Final Report. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20D%20-%20Geomorphology/Bacon%20and%20Lancaster%202012_FINAL_REPORT_Geomorphic_Mapping_of_the_Keeler_Dunefield_and_Surrounding_Areas20121114.pdf

resource extraction, such as gas or water extraction.[39] The depressurizing and dewatering of the clays resulting from possible groundwater extraction in the Owens Lake area are considered to be the primary mechanism for potential ground surface subsidence.[40] Subsidence may occur on the lake bed with large-scale groundwater development but not within the proposed project / proposed action study area.

3.5.2.7 GROUNDWATER

The District has conducted an analysis of groundwater beneath the Keeler Dunes utilizing available data from the existing groundwater wells in the area and ground surface elevation data.[41] The groundwater elevation is approximately 3,614 feet above MSL within the proposed project / proposed action study area. Depth to groundwater from the ground surface across the proposed project / proposed action study area ranges from approximately 196 feet on the eastern border, east of SR 136, to within a few feet of the surface along the southwestern border. The depth to groundwater in the dust control areas is estimated to range from less than 70 feet to less than 10 feet. There are no surface water bodies within the proposed project / proposed action study area.

Regional confined artesian aquifers are present under the lake bed, west of the proposed project / proposed action study area, and display an overall upward movement of water. Groundwater from the alluvial fans along the Inyo Mountains flows to the west toward Owens Lake and supplies many of the springs and seeps near the historic shoreline.[42]

3.5.2.8 LANDSLIDES

Landslides result from unstable slopes that loose cohesion and collapse. Contributing factors to landslides include weakened bedrock, soil erosion, heavy and consistent rainfall, ground shaking from earthquake activity, and fire, as well as by human alteration of the surrounding environment. The proposed project / proposed action study area will not be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the proposed project / proposed action, potentially resulting in on- or off-site landslides or lateral spreading. Although the Sierra Nevada Mountain front and White Mountains have slopes steep enough to initiate a landslide in seismic events, the proposed project / proposed action study area is located on relatively flat land well away from the mountain slopes.

3.5.2.9 SOIL MAP UNITS

The soils in the proposed project / proposed action study area are primarily coarse gravels and silts to sands formed from alluvium from the Inyo Mountains and aeolian sand deposits, respectively.[43] Soil

[39] Johnson, K., Eliason, J., Maddox, G., Brooks, T. June 1999. *Characterization of the Owens Lake Basin Hydrology System, Inyo County, California*. Bishop, CA. Available at: ftp://gbuapcd.org/HydroReports/Hydrology%20Summary%20Report.pdf

[40] Johnson, K., Eliason, J., Maddox, G., Brooks, T. June 1999. *Characterization of the Owens Lake Basin Hydrology System, Inyo County, California*. Bishop, CA. Available at: ftp://gbuapcd.org/HydroReports/Hydrology%20Summary%20Report.pdf

[41] Great Basin Unified Air Pollution Control District, unpublished data analysis, 2012.

[42] Conway, C, 1997.Observation of Ephemeral Flows and Estimation of Recharge from the Inyo and Coso Mountains, Owens Dry Lake, California, Master of Science Thesis, University of Nevada, Reno, Desert Research Institute,

[43] Bacon and Lancaster, 2012. Geomorphic Mapping of the Keeler Dunefield and Surrounding Areas Final Report. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20D%20-

composition varies with depth and can include gravels and silts. Over most of the proposed project / proposed action study area, aeolian sand deposits form thin sand sheets to distinct dune forms. Some of the large dunes in the southern portion of the area can reach heights of 15–20 feet and are actively mobile.

Four geomorphic feature types have been previously mapped for the Keeler Dunefield and Surrounding Areas study, which also overlap with the proposed project / proposed action area and APE: aeolian, alluvial, lacustrine, and anthropogenic (Figure 2.1.5.1-3).[44]

Aeolian features make up the majority (51.3 percent) of the Keeler dune field area and include active dune, active sand sheet, sand sheet with coppice dunes, and vegetated dune landform units.[45] The active sand dunes are generally low in height (2–3 meters; 6–10 feet) and are concentrated in the southwest portion of the proposed project / proposed action area.[46] Active sand sheets are generally flat planar features of sand less than 4 feet (1.2 meters) thick that move across and cover older alluvial surfaces and shoreline features.[47] Sand sheets with coppice dunes are areas of active sand that form low, vegetated sand mounds generally under 3 feet (1 meter) high. [48] Vegetated mounds may reach 10 feet (3 meters) in height, and are found along the western portion of the proposed project / proposed action area. [49] The aeolian sands are typically medium-coarse grained and poorly to moderately sorted.

%20Geomorphology/Bacon%20and%20Lancaster%202012_FINAL_REPORT_Geomorphic_Mapping_of_the_Keeler_Dunefield_and_Surrounding_Areas20121114.pdf

[44] Bacon and Lancaster, Desert Research Institute. November 2012. Geomorphic Mapping of the Keeler Dunefield and Surrounding Areas Final Report. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20D%20-%20Geomorphology/Bacon%20and%20Lancaster%202012_FINAL_REPORT_Geomorphic_Mapping_of_the_Keeler_Dunefield_and_Surrounding_Areas20121114.pdf

[45] Bacon and Lancaster, Desert Research Institute. November 2012. Geomorphic Mapping of the Keeler Dunefield and Surrounding Areas Final Report. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20D%20-%20Geomorphology/Bacon%20and%20Lancaster%202012_FINAL_REPORT_Geomorphic_Mapping_of_the_Keeler_Dunfield_and_Surrounding_Areas20121114.pdf

[46] Lancaster and Bacon, Desert Research Institute. November 2012. Late Holocene *S*tratigraphy and *C*hronology of Keeler Dunes *A*rea FinalReport. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20E%20-%20Stratigraphy%20Chronology%20and%20Sand%20Source%20Analysis/Lancaster%20and%20Bacon%202012a_Late%20Holocene%20stratigraphy%20and%20chronology_Final20121116.pdf

[47] Lancaster and Bacon,Desert Research Institute. November 2012. Late Holocene *S*tratigraphy and *C*hronology of Keeler Dunes *A*rea FinalReport. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20E%20-%20Stratigraphy%20Chronology%20and%20Sand%20Source%20Analysis/Lancaster%20and%20Bacon%202012a_Late%20Holocene%20stratigraphy%20and%20chronology_Final20121116.pdf

[48] Lancaster and Bacon, Desert Research Institute. November 2012. Late Holocene *S*tratigraphy and *C*hronology of Keeler Dunes *A*rea FinalReport. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20E%20-%20Stratigraphy%20Chronology%20and%20Sand%20Source%20Analysis/Lancaster%20and%20Bacon%202012a_Late%20Holocene%20stratigraphy%20and%20chronology_Final20121116.pdf

[49] Lancaster and Bacon, Desert Research Institute. November 2012. Late Holocene *S*tratigraphy and *C*hronology of Keeler Dunes *A*rea FinalReport. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20E%20-%20Stratigraphy%20Chronology%20and%20Sand%20Source%20Analysis/Lancaster%20and%20Bacon%202012a_Late%20Holocene%20stratigraphy%20and%20chronology_Final20121116.pdf

The ***alluvial features*** mapped in the Keeler dune field area include four alluvial fan units of varying age and a flood deposit unit. Generally, the alluvial fans consist of coarse-grained poorly sorted sedimentary deposits that are overlain by younger aeolian units throughout the Keeler dune field area.[50] Flood deposits are mostly composed of silt and fine sand sediments deposited as laterally restricted units along the base of the alluvial fan.[51]

The ***lacustrine features*** mapped in the Keeler dune field area include four lake plain units, two beach ridge units, and two terrace units of varying form and age. The lake plain units are found primarily along the western portion of the area and are sediments deposited on the former lake bottoms with surface cover ranging from a gravely desert pavement to tufa.[52] Beach ridges are sandy ridges parallel to former shorelines that formed through wave action.[53] The terrace units are the oldest units mapped in the Keeler dune field area and consist of well-developed ridges reaching heights of 6–10 feet (2–3 meters).[54] These older unites are found along the southeastern portion of the area outside of the proposed project / proposed action study area.

Anthropomorphic features are areas of significant human disturbance to the natural landscape, such as those that result from road construction.[55] These features are mainly present on the northeastern edge of the Keeler dune field area.

The active dune field deposits overlay older sediment. The northern part of the dune field overlies early to late Holocene (approximately 12,000 years ago to present) alluvial fan deposits, while the southern part of the dune field also overlies late Holocene deposits, alluvial fan deposits, as well as Holocene lacustrine (lake) deposits associated with ancient Owens Lake. Between the dune field and

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[50] Bacon and Lancaster, Desert Research Institute. November 2012. Geomorphic Mapping of the Keeler Dunefield and Surrounding Areas Final Report. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20D%20-%20Geomorphology/Bacon%20and%20Lancaster%202012_FINAL_REPORT_Geomorphic_Mapping_of_the_Keeler_Dunfield_and_Surrounding_Areas20121114.pdf

[51] Bacon and Lancaster, Desert Research Institute. November 2012. Geomorphic Mapping of the Keeler Dunefield and Surrounding Areas Final Report. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20D%20-%20Geomorphology/Bacon%20and%20Lancaster%202012_FINAL_REPORT_Geomorphic_Mapping_of_the_Keeler_Dunfield_and_Surrounding_Areas20121114.pdf

[52] Bacon and Lancaster, Desert Research Institute. November 2012. Geomorphic Mapping of the Keeler Dunefield and Surrounding Areas Final Report. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20D%20-%20Geomorphology/Bacon%20and%20Lancaster%202012_FINAL_REPORT_Geomorphic_Mapping_of_the_Keeler_Dunfield_and_Surrounding_Areas20121114.pdf

[53] Bacon and Lancaster, Desert Research Institute. November 2012. Geomorphic Mapping of the Keeler Dunefield and Surrounding Areas Final Report. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20D%20-%20Geomorphology/Bacon%20and%20Lancaster%202012_FINAL_REPORT_Geomorphic_Mapping_of_the_Keeler_Dunfield_and_Surrounding_Areas20121114.pdf

[54] Bacon and Lancaster, Desert Research Institute. November 2012. Geomorphic Mapping of the Keeler Dunefield and Surrounding Areas Final Report. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20D%20-%20Geomorphology/Bacon%20and%20Lancaster%202012_FINAL_REPORT_Geomorphic_Mapping_of_the_Keeler_Dunfield_and_Surrounding_Areas20121114.pdf

[55] Bacon and Lancaster, Desert Research Institute. November 2012. Geomorphic Mapping of the Keeler Dunefield and Surrounding Areas Final Report. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20D%20-%20Geomorphology/Bacon%20and%20Lancaster%202012_FINAL_REPORT_Geomorphic_Mapping_of_the_Keeler_Dunfield_and_Surrounding_Areas20121114.pdf

the exposed historic lake bed, the surface soil is predominately clays and silts associated with Late Holocene Owens Lake. In places within the dune field, there are scattered areas of thin (up to 20 centimeters) laminated silt deposits that overlie horizontally laminated or cross-bedded sand of aeolian origin.[56] Mineralogical analyses indicate that sand that composes the dune field was derived from the Owens River system.[57] The mineral composition of the sand in the Keeler Dunes is dominated by quartz and feldspar.[58]

3.5.2.10 EXPANSIVE SOILS

Soils that expand and contract in volume ("shrink-swell" pattern) are considered to be expansive and may cause damage to above ground structures as a result of density changes that shift overlying materials. Fine-grain clay sediments are most likely to exhibit shrink-swell patterns in response to changing moisture levels. As described above, the majority of soils in the proposed project / proposed action study area are gravels to coarse sands. These types of soils do not exhibit shrink-swell patterns and are not considered expansive soils.

3.5.2.11 DIFFERENTIAL SETTLEMENT

Differential settlement is the uneven settlement of a foundation due to unequal compaction of the surrounding soil. The conditions for differential settlement may be present along the historic shoreline, in the extreme southern portion of the proposed project / proposed action study area where the soils are finer-texture and the groundwater is close to the surface. Due to the presence of coarse alluvial material over most of the rest of the proposed project / proposed action study area and the overall depth of the groundwater, the conditions for differential settlement over the rest of the proposed project / proposed action study area is considered to be low.

3.5.2.12 MINERAL RESOURCES

Inyo County is rich in mineral resources. Mineral resources identified in the Inyo Mountains east of the proposed project / proposed action study area include gold, silver, lead, zinc, tungsten, talc, and bismuth.[59] The proposed project / proposed action study area is located on an alluvial fan extending west from the Inyo Mountains. Trace amounts of valued mineral resources may have been transported into the proposed action study area through the alluvial fan, but there are no mineable mineral resources identified within the proposed project / proposed action study area since any potential material is dispersed through alluvial action.

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[56] Desert Research Institute. 9 March 2012. Development of the Keeler Dunefield, Part 1 – "Analysis of Aerial Photographs and Satellite Images." Reno, NV.

[57] Desert Research Institute. 9 March 2012. Development of the Keeler Dunefield, Part 1 – "Analysis of Aerial Photographs and Satellite Images." Reno, NV.

[58] Desert Research Institute. 9 March 2012. Development of the Keeler Dunefield, Part 1 – "Analysis of Aerial Photographs and Satellite Images." Reno, NV.

[59] Conrad, J., Kilburn, J., Blakely, R. 1987. "Mineral Resources of the Southern Inyo Wilderness Study Area, Inyo County, California." *U.S. Geological Survey Bulletin 1705-B*. Washington D.C.

3.6 PALEONTOLOGICAL RESOURCES

Paleontological resources, or fossils, are the remains and/or traces of prehistoric plant and animal life (typically older than 10,000 years old). This section describes federal, state, and local regulations applicable to paleontological resources. It also describes the environmental setting with regard to geologic deposits on the proposed project / proposed action site and potential for these deposits to contain paleontological resources. Information contained in this section is summarized from the Keeler Dunes Dust Control Project Paleontological Survey Report (Appendix F of this EIR/EA).

3.6.1 REGULATORY FRAMEWORK

3.6.1.1 FEDERAL

Paleontological Resources Preservation Act (Omnibus Act)

The intent of the federal Paleontological Resources Preservation Act of 2009 (PRPA) is to regulate the collection of vertebrate fossils and other rare and scientifically significant fossils. Under the PRPA, collection should be conducted by qualified researchers who obtain a permit from the appropriate state or federal agency and agree to donate any materials recovered to recognized public institutions where they will remain accessible to the public and to other researchers. All federal land management agencies are required to develop regulations that satisfy the stipulations of the PRPA.

3.6.1.2 STATE

California Environmental Quality Act

Paleontological resources are afforded protection by environmental legislation set forth under CEQA. Appendix G (part V) of the CEQA Guidelines provides guidance relative to significant impacts on paleontological resources, indicating that a proposed project would have a significant impact on paleontological resources if it will disturb or destroy a unique paleontological resource or site or unique geologic feature. Section 5097.5 of the California Public Resources Code specifies that any unauthorized removal of paleontological remains is a misdemeanor. Furthermore, California Penal Code Section 622.5 sets the penalties for damage or removal of paleontological resources.

Public Resources Code, Section 5097.5

Public Resources Code, Section 5097.5 defines as a misdemeanor the unauthorized disturbance or removal of archaeological, historic, or paleontological resources located on public lands.

3.6.2 AFFECTED ENVIRONMENT

The affected environment addressed in this portion of the analysis is defined as the proposed project / proposed action study area. The proposed project / proposed action study area, measuring approximately 870.6 acres, is located on BLM- and LADWP-owned and administered lands in Inyo

County, California. Not all portions of the proposed project / proposed action study area will be subjected to DCM implementation.

3.6.2.1 AREA OF POTENTIAL EFFECT

The Area of Potential Effect (APE) for paleontological resources measures 295.4 acres and consists of the portions of the proposed project / proposed action study area that have been designated for DCM implementation, staging areas, and temporary access routes (see Figure 3.4.2.1-1, *Area of Potential Effects for Cultural Resources*). The APE has the potential to be subjected to direct effects, such as minimal ground disturbance resulting from the planting and establishment of native vegetation, construction of temporary access routes, and a temporary water delivery system. The APE includes a 100-foot buffer area surrounding the area of dust control implementation that will account for indirect effects such as dust, foot traffic, and so forth.

3.6.2.2 PALEONTOLOGICAL SETTING

Paleontological Context

The geologic stratigraphy of the White-Inyo Range encompasses a period of approximately 700 million years, with deposits dating from the Precambian to the Holocene.[1] The Owens Valley forms the westernmost basin of the Great Basin physiographic province and collects a variety of sediments transported from the Sierra Nevada Mountains to the west and the White and Inyo Mountains to the east.[2]

During most of the Late Pleistocene, Owens Lake was an open-basin lake reaching high stands between approximately 3,756 feet (1,145 meters) and 3,805 feet (1,160 meters) above mean sea level. The Owens Lake basin has been closed from about 15,000 years ago through the Holocene to the present.[3] During closed-basin conditions there is no transport of material, either water or sediment, except through evaporation or wind transport.[4] The closed-basin conditions and multiple lake level oscillations at Owens Lake combined with tectonic subsidence of the valley floor make for a unique lacustrine paleontological environment.

Paleoenvironmental analyses indicate that the level of Owens Lake has varied substantially (oscillated) over the past approximately 27,000 calibrated years before present (cal yr BP).[5] Studies indicate the lake reached high stands between about 24,000 and 23,730 cal yr BP, 15,700 and 15,000 cal yr BP, and 7860 and 7650 cal yr BP.[6,7] Period of low lake level were recorded between

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[1] Nelson, Clemens A., Clarence A. Hall, Jr., and W.G. Ernst. 1991. Geologic History of the White-Inyo Range. In *Natural History of the White Inyo-Range Eastern California*, edited by Clarence A. Hall, Jr., pp. 42-74. University of California Press, Berkeley.

[2] Hunt, C.B. 1967. *Physiography of the United States*. San Francisco, CA: W.H. Freeman and Company.

[3] Bacon, S.N., R.M. Burke, S.K. Pezzopane, and A.S. Jayko. 2006. "Last Glacial Maximum and Holocene Lake Levels of Owens Lake, Eastern California, USA." *Quaternary Science Reviews*, 1–19.

[4] Soil and Water West, Inc. 25 September 2001. *Owens Lakebed Survey (Revised)*. Prepared by: Soil and Water West, Inc., P.O. Box 44666, Rio Rancho, NM. Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA.

[5] Bacon, S.N., R.M. Burke, S.K. Pezzopane, and A.S. Jayko. 2006. "Last Glacial Maximum and Holocene Lake Levels of Owens Lake, Eastern California, USA." *Quaternary Science Reviews*, 1–19.

[6] Bacon, S.N., R.M. Burke, S.K. Pezzopane, and A.S. Jayko. 2006. "Last Glacial Maximum and Holocene Lake Levels of Owens Lake, Eastern California, USA." *Quaternary Science Reviews*, 1–19.

approximately 18,920 and 15,590 cal yr BP, at 11,200 cal yr BP, and between 6500 and 4400 cal yr BP.[8] Lake oscillations continued throughout the Holocene.[9]

3.6.2.3 RECORDS SEARCH

A. Prior Research

The potential for paleontological resources within the proposed project / proposed action study area was assessed using data obtained from record searches at the Natural History Museum of Los Angeles County (NHMLAC)[10] and the San Bernardino County Museum (SBCM).[11] The NHMLAC and the SBCM conducted thorough searches of their respective paleontology collection records for the locality and specimen data for the proposed project / proposed action study area. A detailed geomorphic map of Keeler Dunes was also reviewed to identify the geomorphic units that underlay the proposed project / proposed action study area.[12] The record searches indicate that there are no known vertebrate fossil localities recorded within the proposed project / proposed action study area; however, there are an abundance of known vertebrate fossil localities within the vicinity of the proposed project / proposed action study area.

The areas within the proposed project / proposed action area were evaluated for paleontological resources using the BLM's Potential Fossil Yield Classification System (PFYC).[13] In the PFYC system, geologic units are classified based on the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils and their sensitivity to adverse impacts, with a higher class number indicating a higher sensitivity. Five classes comprise the PFYC system and include: Class 1 – Very Low, Class 2 – Low, Class 3 – Moderate or Unknown, Class 4 – High, and Class 5 – Very High. This classification is applied to the geologic formation, member, or other distinguishable unit, preferably at the most detailed mappable level.

The results of the records searches and map review indicate that the surface geology of the study area primarily consists of aeolian, alluvium, and lacustrine units dating to the Quaternary Period (Pleistocene and Holocene Epochs). Most of the proposed project / proposed action area is characterized by recent aeolian deposits composed of active sand sheets and dunes interspersed

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[7] Orme, A.R, and A.J. Orme. 1993. "Late Pleistocene Oscillations of Lake Owens, Eastern California." *Geological Society of America Abstracts with Programs*, *25*: 129–130.

[8] Benson, L., Kashgarian, M., Rye, R., Lund, S., Paillet, F., and Smoot, J. 2002. "Holocene Multidecadal and Multicentennial Droughts Affecting Northern California and Nevada." *Quaternary Science Review*, *21*: 659–682.

[9] Li, H-C., Bischoff, J.L., Ku, T.L., Lund, S.P., and Stott, L.D. 2000. "Climate Variability in East Central California during the Past 1000 Years Reflected by High Resolution Geochemical and Isotopic Records from Owens Lake Sediments." *Quaternary Research*, *54*: 189–197.

[10] McLeod, Samuel, Natural History Museum of Los Angeles County, Los Angeles, CA. 11 October 2011. Letter response to Clarus Backes, Sapphos Environmental, Inc., Pasadena, CA.

[11] Scott, Eric, San Bernardino County Museum, Redlands, CA. 28 February 2012. Letter response to Tiffany Clark, Sapphos Environmental, Inc., Pasadena, CA.

[12] Bacon, S, and N. Lancaster. November 2012. Late Holocene Stratigraphy and Chronology of Keeler Dunes Area Final Report by the Desert Research institute to the Great Basin Unified Air Pollution Control District. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20E%20-%20Stratigraphy%20Chronology%20and%20Sand%20Source%20Analysis/Lancaster%20and%20Bacon%202012a_Late%20Holocene%20stratigraphy%20and%20chronology_Final20121116.pdf

[13] Bureau of Land Management. 2008–2009. *Guidelines for Determining Paleontological Significance*. Available at: http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/im_attachments/2008.Par.69083.File.dat/IM2008-009_att1.pdf

with coarse quaternary alluvial fan sediments; these alluvial deposits originate from the adjacent Inyo Mountains and typically do not contain significant vertebrate fossils.[14] These geologic units exhibit a Class 2 – Low sensitivity in the PFYC system due to their young age (less than 10,000 years BP). Surficial lacustrine sediments dating to the late Holocene are also located along the western edge of the proposed project / proposed action study area. The Holocene lake sediments were deposited during high stands of Owens Lake during the Holocene and are therefore more likely to contain the fossil remains of vertebrates and invertebrates dating to that epoch.[15] Paleontological resources surveys conducted along the lake margin immediately northwest of Keeler Dunes in 2003 and 2008 identified a number of Late Pleistocene and recent faunal remains in the lacustrine deposits located along the base of the quaternary alluvial fan on the bed of Owens Lake.[16,17] In summary, the surface of the proposed project / proposed action area and APE consist of Class 2 – Low sensitivity dune sand and alluvium and small areas of Class 4 – High sensitive lacustrine deposits. The Class 4 – High sensitive lacustrine deposits generally occur at much greater depths below the Class 2 Low sensitivity surface. However, portions of Staging Area 1, Staging Area 2, and temporary access the Staging Area 3 may be within lacustrine deposits near the surface. Given the known presence of paleontological resource localities associated with lacustrine deposits in the vicinity of the proposed project / proposed action, these areas of the APE have a Class 4 – High paleontological sensitivity.

B. Previously Recorded Resources

Recent paleontological resources surveys conducted along the lake margin immediately northwest of Keeler Dunes have identified a number of Late Pleistocene and recent faunal remains in the lacustrine deposits located along the base of the Keeler alluvial fan.[18,19] Vertebrate fossil specimens identified during this work include artiodactyl, rodent, pocket gopher (*Thomomys bottae*), duck (*Aythya affinis*), and western meadowlark (*Sturnella neglecta*); Holocene shells, consisting of California floater (*Anodonta californiensis*), Ram's horn (*Helisoma newberryi*), and physa (*Physella*), were also found during this work.[20] Located approximately 3 miles northwest of the Keeler Dunes area, fossil localities have been discovered in Quaternary alluvium that contained extinct horse (*Equus*), camel (*Camelops*), and bison (*Bison*).[21] The fossil remains of mammoth

[14] McLeod, Samuel, Natural History Museum of Los Angeles County, Los Angeles, CA. 11 October 2011. Letter response to Clarus Backes, Sapphos Environmental, Inc., Pasadena, CA.

[15] Scott, Eric, San Bernardino County Museum, Redlands, CA. 28 February 2012. Letter response to Tiffany Clark, Sapphos Environmental, Inc., Pasadena, CA.

[16] Gust, S. May 2003. *Paleontological Assessment Report and Mitigation Plan for the Owens Valley Project, Inyo County, California*. Prepared for: Sapphos Environmental, Inc., Pasadena, CA. Prepared by: Cogstone Resource Management, Inc., Santa Ana, CA.

[17] Gust, S., and K. Scott. 2008. *Paleontological Evaluation of 2008 Supplemental Control Requirements for the Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan, Inyo County, California*. Prepared for: Sapphos Environmental, Inc., Pasadena, CA. Prepared by: Cogstone Research Management, Inc., Santa Ana, CA.

[18] Gust, Sherri. 2003. Paleontological Assessment Report and Mitigation Plan for the Owens Valley Project, Inyo County, California. Report prepared for Sapphos Environmental, Inc., Pasadena, CA. Cogstone Resource Management Inc., Santa Ana, CA.

[19] Gust, Sherri, and Kim Scott. 2008. Paleontological Evaluation of 2008 Supplemental Control Requirements for the Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan, Inyo County, California. Report prepared for Sapphos Environmental, Inc., Pasadena, CA. Cogstone Resource Management Inc., Santa Ana, CA.

[20] Gust, Sherri. 2003. *Paleontological Assessment Report and Mitigation Plan for the Owens Valley Project, Inyo County, California*. Prepared by Cogstone Resource Management Inc., Santa Ana, CA.

[21] Streitz, R. and M.C. Stinson. 1974. Geologic Map of California: Death Valley Sheet. Los Angeles, CA: California

(*Mammuthus*) and mountain lion (*Felis concolor*) have also been identified in the Lone Pine region north of Owens Lake along the Owens River.[22,23,24] Finally, a core sample of lake bed sediments taken in the southwestern portion of Owens Lake recovered paleofaunal remains and fossil fish identified as the Owens chub (*Gila bicolor snyderi*) and the Owens sucker (*Catostomus fumeiventris*).[25]

3.6.2.4 FIELD SURVEY AND SITE RECORDATION RESULTS

No paleontological resources were identified during the paleontological surveys of the APE in areas that are subject to ground disturbance by operations of the proposed project / proposed action. However, results of the field visit confirmed the presence of lacustrine deposits in portions the staging areas and along the access routes. These geological units have a high paleontological sensitivity. As a result, should ground disturbances exceed one foot, spot checking / monitoring by a qualified paleontologist is recommended; however, the project is not anticipated to exceed over a foot of ground disturbance. As a result, no further mitigation measures are recommended for this proposed project / proposed action.

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[22] Hayes, OP. 1927. The Pleistocene of the western region of North American and its vertebrate animals. Carnegie Institute of Washington Publication 322(B):1-346.

[23] Jefferson, G.T. 1989. Late Pleistocene and earliest Holocene fossil localities and vertebrate taxa from the western Mojave Desert. In *The West-central Mojave Desert: Quaternary Studies between Kramer and Afton Canyon*, edited by G.T. Jefferson, pp. 27-40. SBCM Association Special Publication, Redlands, CA.

[24] Jefferson, G.T. *A Catalogue of late Quaternary Vertebrates from California: Part Two, Mammals*. Technical Reports No. 7. Natural History Museum of Los Angeles County, Los Angeles.

[25] Sapphos Environmental, Inc. 2008. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Final Subsequent Environmental Impact Report*, p.3.3-9. Prepared for Great Basin Unified Air Pollution Control District. Prepared by: Sapphos Environmental, Inc., Pasadena, CA.

3.7 GREENHOUSE GAS EMISSIONS AND GLOBAL CLIMATE CHANGE

Gases that absorb and reemit infrared radiation in the atmosphere are called greenhouse gases (GHGs), in reference to the fact that greenhouses retain heat. Common GHGs include carbon dioxide (CO_2), water vapor (H_2O), methane (CH_4), nitrous oxide (N_2O), fluorinated gases, and ozone (O_3). Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas CH_4 results from off-gassing associates with agricultural practices and landfills. Man-made GHGs, many of which have greater heat-absorption potential than CO_2, include fluorinated gases such as hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6).

The accumulation of GHGs in the atmosphere regulates Earth's temperature. Without the natural heat-trapping effect of GHGs, Earth's surface would be about 34°C (degrees Celsius) cooler. However, it is believed that emissions from human activities, particularly the consumption of fossil fuels for electricity production and transportation, have elevated the concentration of these gases in the atmosphere beyond the level of naturally occurring concentrations. This phenomenon is commonly referred to as climate change.

3.7.1 REGULATORY FRAMEWORK

3.7.1.1 FEDERAL

In 1988, the United Nations and the World Meteorological Organization established the Intergovernmental Panel on Climate Change (IPCC) to assess "the scientific, technical and socioeconomic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts, and options for adaptation and mitigation." The most recent reports of the IPCC have emphasized the scientific consensus that real and measurable changes to the climate are occurring; that they are caused by human activity; and that significant adverse impacts on the environment, the economy, and human health and welfare are unavoidable.

The United States joined other countries around the world in signing the United Nations Framework Convention on Climate Change (UNFCCC). The UNFCCC was entered on March 21, 1994. Under the convention, governments gather and share information on GHG emissions, national policies, and best practices; launch national strategies for addressing GHG emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries; and cooperate in preparing for adaptation to the impacts of climate change.

On December 7, 2009, the U.S. Environmental Protection Agency (EPA) Administrator signed two distinct findings regarding GHG under Section 202(a) of the Federal Clean Air Act:

- Endangerment Finding: The Administrator finds that the current and projected concentrations of the six key well-mixed GHG (CO_2, CH_4, N_2O, hydrofluorocarbons [HFCs], perfluorocarbons [PFCs], and SF6) in the atmosphere threaten the public health and welfare of current and future generations.

- Cause or Contribute Finding: The Administrator finds that the combined emissions of these well-mixed GHG from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which, threatens public health and welfare.

A. Bureau of Land Management Guidance on Greenhouse Gases

On September 14, 2009, Secretary of the Interior Ken Salazar issued Order No. 3289, addressing the impacts of climate change on domestic water, land, and other natural and cultural resources. The Order establishes an approach for increasing understanding of climate change and responding to potential climate change related impacts as relevant to the resources that the Department of the Interior (DOI) manages. The document specifically identifies potential impact areas including potential changes in flood risk and water supply, sea level rise, changes in wildlife and habitat populations and their migration patterns, new invasions of exotic species, and increased threat of wildland fire. The Order includes Climate Change Response Planning Requirements, which require each bureau and office within the DOI (including BLM) to consider and analyze potential climate change impacts when undertaking long-range planning exercises, setting priorities for scientific research and investigations, developing multiyear management plans, and making major decisions regarding potential use of resources under DOI's purview.

B. Draft National Environmental Policy Act Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions

On February 18, 2010, the White House Council on Environmental Quality (CEQ) released, for public review and comment, a draft Guidance Memorandum for Heads of Federal Departments and Agencies on the consideration of GHG emissions and climate change impacts as part of compliance with NEPA.[1] All federal agency actions requiring NEPA review, except federal land and resource management activities, are covered by this Guidance. The draft Guidance provides formal guidance from CEQ to the federal agencies on the treatment of GHG emissions within NEPA: (1) the treatment of GHG emissions that may directly or indirectly result from a proposed federal action and (2) the analysis of potential climate change impacts upon a proposed federal action. In addition, the draft Guidance proposes several key elements for the examination of GHG emissions and climate change impacts:

- A "reference point" of 25,000 metric tons of direct CO_2-equivalent GHG emissions is proposed as an "indicator" to determine if a proposed federal action's anticipated GHG emissions warrant detailed consideration in a NEPA review. However, for indirect GHG emissions, there is no proposed reference point.

3.7.1.2 STATE

A. Executive Order S-3-05

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05. Recognizing that California is particularly vulnerable to the impacts of climate change, Executive Order S-3-05 establishes statewide climate change emission reduction targets to reduce $CO_{2equivalent}$ (CO_{2e}) to the 2000 level (473 million metric tons) by 2010, to the 1990 level (427 million metric tons of CO_{2e}) by 2020, and to 80 percent below the 1990 level (85 million metric tons of CO_{2e}) by 2050 (Table 3.7.1.2-1, *California Greenhouse Gas Business-as-Usual Emissions and Targets*). In addition, the Cal/EPA

[1] The White House Council on Environmental Quality. 18 February 2010. *Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions*. Available at: http://www.whitehouse.gov/sites/default/files/microsites/ceq/20100218-nepa-consideration-effects-ghg-draft-guidance.pdf

Secretary is responsible for submitting biannual reports to the governor and state legislature that outline: (1) progress made toward reaching the emission targets, (2) impacts of global warming on California's resources, and (3) measures and adaptation plans to mitigate these impacts. To further ensure accomplishment of the targets, the California EPA Secretary created a Climate Action Team composed of representatives from the aforementioned agencies to implement global warming emission reduction programs and report on the progress made toward meeting the statewide GHG targets established in this executive order. In December 2005, the first report was released, which stated, "the climate change emission reduction targets [could] be met without adversely affecting the California economy," and "when all [the] strategies are implemented, those underway and those needed to meet the Governor's targets, the economy will benefit."[2]

TABLE 3.7.1.2-1
CALIFORNIA GREENHOUSE GAS BUSINESS-AS-USUAL EMISSIONS AND TARGETS

Year	1990	2000	2010	2020
Business-as-usual emissions* (million metric tons of CO_{2e})	427	473	532	596
Target emissions (million metric tons of CO_{2e})	—	—	473	427

Note: * Business-as-usual emissions reflect the projected emissions under a scenario without GHG control measures, where California would continue to emit GHGs at the same per capita rate. The California Air Resources Board (CARB) has not yet projected 2050 emissions under a business-as-usual scenario

B. Assembly Bill 32

Assembly Bill 32 (AB 32), also known as the Global Warming Solutions Act of 2006, is a California State Law that addresses climate change by establishing a comprehensive program to reduce greenhouse gas (GHG) emissions from all sources throughout the state. AB 32 requires that the California Air Resources Board (CARB) develop regulations and market mechanisms to reduce California's GHG emissions to 1990 levels by 2020. To achieve this goal, AB 32 mandates that CARB establish a quantified emissions cap; institute a schedule to meet the cap; implement regulations to reduce statewide GHG emissions from stationary sources; and develop tracking, reporting, and enforcement mechanisms to ensure that reductions are achieved.

C. Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California Recommended for Board Consideration

In October 2007, CARB published a list of 44 early action measures to reduce GHG emissions in California pursuant to AB 32. The early action measures identified by the CARB included previously approved discrete early action items, such as low carbon fuel standard, restriction on high global warming potential refrigerants, and landfill methane capture. Additional early actions such as smartway truck efficiency, tire inflation program, and anti-idling enforcement were recommended. This list reflected state guidance on GHG emission reduction measures that warrants consideration by the District.

[2] California Climate Action Team. 3 April 2006. *Climate Action Team Report to Governor Schwarzenegger and the Legislature*. Sacramento, CA.

D. California Air Pollution Control Officers Association

In August 2010, the California Air Pollution Control Officers Association (CAPCOA) published guidance on quantifying GHG emissions mitigation measures. The guidance was a resource tool for local government to assess emission reductions from GHG mitigation measures. The guidance listed various purposes for quantifying GHG emission reduction, including voluntary reductions of GHG emissions, reductions to mitigate current or future GHG emissions at a project level, reductions for regulatory compliance with command and control regulations, permitting programs, cap-and-trade programs, mandatory reporting rule for specified stationary sources, and reductions to obtaining GHG emission credits. In addition, the guidance listed quantification concepts, approaches, and methodologies. Quantification methodologies for a selection of GHG emission reduction measures such as vegetation (including trees), construction equipment, and transportation were discussed. This guidance demonstrated state-recommended methods on how to quantify GHG emission mitigation measures that warrants consideration by the District.

3.7.2 AFFECTED ENVIRONMENT

Information in this section provides a summary of the effects and sources of GHGs and global climate change. Information in this section is derived from CARB sources, as well as data and research conducted by the IPCC. The discussion provided below provides an overview of GHGs currently generated on the proposed project / proposed action site, the carbon sequestration potential of the proposed project / proposed action site, an overview of global climate change, and the impacts that global climate change may have on California's resources.

3.7.2.1 PROPOSED PROJECT / PROPOSED ACTION SITE

The proposed project / proposed action is located on lands administered by the BLM and the LADWP. The proposed project / proposed action site is approximately 194 acres in size and is located within a 1.36-square-mile (870.6-acre) proposed project / proposed action study area. The proposed project / proposed action study area is located on the Keeler alluvial fan situated between the base of the Inyo Mountains to the east-northeast and the dried bed of Owens Lake to the west-southwest. The proposed project / proposed action study area extends approximately 2.5 miles to the northwest from the community of Keeler and is bisected by California State Route 136 (SR 136).

There are limited "point source" quantities of GHGs currently being produced on the proposed project / proposed action site in the form of emissions associated vehicle emissions from traffic on SR 136. These emissions are not considered a major GHG source, and as such, the existing use of the land is not a major or significant generator of GHGs. The existing sparse vegetation has little to no value for biomass carbon sequestration, and do not provide positive impacts related to GHG reductions.

3.7.2.2 GLOBAL CLIMATE CHANGE

Global climate change is a change in the average weather of the earth that is measured by temperature, wind patterns, precipitation, and storms over a long period of time. The baseline, against which these changes are measured, originates in historical records identifying temperature changes that have occurred in the past, such as during previous ice ages. The global climate is continuously changing, as evidenced by repeated episodes of substantial warming and cooling documented in the geologic record. The rate of change has typically been incremental, with warming and cooling trends occurring over the course of thousands of years. The past 10,000 years have been marked by a period of incremental warming, as glaciers have steadily retreated across the globe. However, scientists have observed an unprecedented acceleration in the rate of warming during the past 150 years. Global climate change is a documented effect. Although the degree to which the change is cause by anthropogenic (man-made) sources is still under study, the increase in warming has coincided with the global industrial revolution, which has seen the widespread reduction of forests to accommodate urban centers, agriculture, and the use of fossil fuels—primarily the burning of coal, oil, and natural gas for energy. The majority of scientists agree that anthropogenic sources are a main, if not primary, contributor to the global climate change warming.

The effects of increasing global temperature are far-reaching and extremely difficult to quantify. The scientific community continues to study the effects of global climate change. In general, increases in the ambient global temperatures as a result of increase GHGs is anticipated to result in rising seas levels, which could threaten coastal areas through accelerated coastal erosion, threats to levees and inland water systems and disruption to coastal wetlands and habitat.

If the temperature of the ocean warms, it is anticipated that the winter snow season would be shortened. Snowpack in the Sierra Nevada provides both water supply (runoff) and storage (within the snowpack before melting), which is a major source of supply for the state. According to a California Energy Commission (CEC) report, the snowpack portion of the supply could potentially decline by 70 percent to 90 percent by the end of the twenty-first century.[3] This phenomenon could lead to significant challenges securing an adequate water supply for a growing state population. Furthermore, the increased ocean temperature could result in increased moisture flux into the state; however, since this would likely increasingly come in the form of rain rather than snow in the high elevations, increased precipitation could lead to increased potential and severity of flood events, placing more pressure on California's levee/flood control system.

Sea level has risen approximately seven inches during the last century, and according to the CEC report, it is predicted to rise an additional 22 to 35 inches by 2100, depending on the future GHG emissions levels. If this occurs, resultant effects could include increased coastal flooding, saltwater intrusion, and disruption of wetlands. As the existing climate throughout California changes over time, mass migration of species, or failure of species to migrate in time to adapt to the perturbations in climate, could also result.

A. Public Health

Higher temperatures are expected to increase the frequency, duration, and intensity of conditions conducive to air pollution formation. For example, days with weather conducive to ozone formation are projected to increase from 25 percent to 35 percent under the lower warming range, to 75 percent to 85 percent under the medium warming range. In addition, if global background ozone levels increase as predicted in some scenarios, it may become impossible to meet local air quality standards. Air quality could be further compromised by increases in wildfires, which emit fine particulate matter that can travel long distances depending on wind conditions. The Climate Scenarios report indicates that large wildfires could become up to 55 percent more frequent if GHG emissions are not significantly reduced.

In addition, under the higher warming scenario, there could be up to 100 more days per year with temperatures above 90 degrees Fahrenheit in Los Angeles and 95 degrees Fahrenheit in Sacramento by 2100. This is a large increase over historical patterns and approximately twice the increase projected if

[3] California Energy Commission. 2006. *Scenarios of Climate Change in California: An Overview*. Sacramento, CA.

temperatures remain within or below the lower warming range. Rising temperatures will increase the risk of death from dehydration, heat stroke/exhaustion, heart attack, stroke, and respiratory distress caused by extreme heat.

3.7.2.3 SOURCES AND GLOBAL WARMING POTENTIALS OF GREENHOUSE GASES

The State of California GHG Inventory performed by the CARB compiled statewide anthropogenic GHG emission and sinks. It includes estimates for CO_2, CH_4, N_2O, SF6, HFCs, and PFCs. The current inventory covers the years 1990 to 2004, and is summarized in Table 3.7.2.3-1, *State of California GHG Emissions by Sector*. Data sources used to calculate this GHG inventory include California and federal agencies, international organizations, and industry associations. The calculation methodologies are consistent with guidance from the IPCC. The 1990 emissions level is the sum total of sources and sinks from all sectors and categories in the inventory. The inventory is divided into seven broad categories in the inventory. These sectors include: agriculture, commercial, electricity generation, forestry, industrial, residential, and transportation.

TABLE 3.7.2.3-1
STATE OF CALIFORNIA GHG EMISSIONS BY SECTOR

Sector	Total 1990 Emissions (MMTCO2e)*	Percent of Total 1990 Emissions	Total 2004 Emissions (MMTCO2e)	Percent of Total 2004 Emissions
Agriculture	23.4	5 percent	27.9	6 percent
Commercial	14.4	3 percent	12.8	3 percent
Electricity generation	110.6	26 percent	119.8	25 percent
Forestry (excluding sinks)	0.2	<1 percent	0.2	<1 percent
Industrial	103.0 percent	24 percent	96.2	20 percent
Residential	29.7	7 percent	29.1	6 percent
Transportation	150.7	35 percent	182.4	38 percent
Forestry sinks	(6.7)		(4.7)	

Note: *MMTCO2e = Million metric tons of CO_2 equivalent
Source: California Air Resources Board. Revised 2 December 2009. *Facts about California Greenhouse Gas Emissions Inventory*. Available at: http://www.arb.ca.gov/cc/factsheets/ghginv.pdf

When accounting for GHGs, all types of GHG emissions are expressed in terms of CO_{2e} and are typically quantified in metric tons (MT) or millions of metric tons (MMT). GHGs have varying global warming potential (GWP). The GWP represents how much a given mass of a chemical contributes to global warming over a given time period compared to the same mass of carbon dioxide (CO_2 GWP is defined as 1.0). The other main GHGs that have been attributed to human activity include CH_4, which has a GWP of 21, and N_2O, which has a GWP of 310. Table 3.7.2.3-2, *Global Warming Potentials and Atmospheric Lifetimes of GHGs*, presents the GWP and atmospheric lifetimes of common GHGs.

TABLE 3.7.2.3-2
GLOBAL WARMING POTENTIALS AND ATMOSPHERIC LIFETIMES OF GHGS

GHG	Formula	100-Year Global Warming Potential	Atmospheric Lifetime (Years)
Carbon dioxide	CO_2	1	Variable
Methane	CH_4	21	12 ± 3
Nitrous dioxide	N_2O	310	120
Sulfur hexafluoride	SF_6	23,900	3,200

Source: California Air Resources Board. Revised 2 December 2009. *Facts about California Greenhouse Gas Emissions Inventory*. Available at: http://www.arb.ca.gov/cc/factsheets/ghginv.pdf

Human-caused sources of CO_2 include combustion of fossil fuels (coal, oil, natural gas, gasoline, and wood). Data from ice cores indicate that CO_2 concentrations remained steady prior to the current period for approximately 10,000 years. Concentrations of CO_2 have increased in the atmosphere since the Industrial Revolution.

CH_4 is the main component of natural gas and also arises naturally from anaerobic decay of organic matter. Human-caused sources of natural gas include landfills, fermentation of manure, and cattle farming. Human-caused sources of N_2O include combustion of fossil fuels and industrial processes. According to the Intergovernmental Panel on Climate Change (IPCC), SF_6 is the most potent GHG. SF_6 is a colorless, odorless, nontoxic, nonflammable gas that is used as an insulating agent in electrical equipment. Other GHGs are present in trace amounts in the atmosphere and are generated from various industrial or other uses.

The sources of GHG emissions, GWP, and atmospheric lifetime of GHGs are all important variables to be considered in the process of calculating CO_{2e} for discretionary land use projects that require a climate change analysis. It is anticipated that long-term GHG emissions, particularly PM_{10} emissions, will be reduced as a result of implementing the proposed project / proposed action.

3.8 HYDROLOGY AND WATER QUALITY

This section describes federal, state and local regulations applicable to hydrology and water quality. It also describes the environmental setting of the proposed project / proposed action site with regard to the regional hydrologic setting, existing hydrology/drainage (on-site and off-site), and existing flood hazards in the vicinity of the proposed project / proposed action site. Water quality is also characterized in terms of groundwater beneath the proposed project / proposed action site and surface water hydrology for the southeastern Owens Valley. The characterization of hydrology and water quality is based on information provided by the Inyo County General Plan,[1] past hydrological studies and data from the OVPA studies, and the State of California Regional Basin Plan, Lahontan Region.[2]

3.8.1 REGULATORY FRAMEWORK

3.8.1.1 FEDERAL

A. Section 401 and 402 of the Clean Water Act of 1972

The federal Clean Water Act (CWA) of 1972 sets national goals and policies to eliminate discharge of water pollutants into navigable waters and to achieve a water-quality level that will protect fish, shellfish, and wildlife while providing for recreation in and on the water whenever possible.[3] The CWA regulates point-source and non-point-source discharges to receiving waters with the National Pollutant Discharge Elimination System (NPDES) program. The CWA provides for delegation of certain water-quality control and planning responsibilities to the states. The State of California (State) has been authorized by the U.S. Environmental Protection Agency (U.S. EPA) to administrate and enforce portions of the CWA, including the NPDES program. The State issues NPDES permits through the State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCBs). The proposed project / proposed action is regulated by the Lahontan RWQCB.

Section 401

The Clean Water Act made it unlawful to discharge any pollutant from a point source into navigable waters, unless a permit was obtained as required under Section 401. Per Section 401, any activity that may result in a discharge into waters of the U.S. must be certified by the California State Water Resources Control Board (SWRCB) as administered by the Regional Water Quality Control Boards (RWQCB). This certification ensures that an action does not violate State and/or Federal water quality standards. The proposed project / proposed action site is located in the jurisdiction of the Lahontan RWQCB.

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[1] Inyo County Planning Department. December 2001. *Inyo County General Plan, Conservation and Open Space Element*. Independence, CA.

[2] Lahontan Regional Water Quality Control Board. n.d. *Basin Plan*. Available at: http://www.swrcb.ca.gov/rwqcb6/water_issues/programs/basin_plan/index.shtml

[3] *United States Code*, Title 33, Section 1341: "A Certification."

Section 402 National Pollutant Discharge Elimination System

The CWA was amended in 1987 to expressly prohibit the discharge of pollutants from storm water to waters of the United States, unless the discharge is in compliance with a NPDES permit. The 1987 amendment to the CWA added Section 402(p) and established a framework for regulating industrial, municipal, and construction storm water discharges under NPDES. The 1987 amendment was developed in recognition that storm water runoff, a non-point-source discharge, is a significant source of water pollution. In 1990, the U.S. EPA published final regulations that established application requirements to determine the conditions under which industrial, municipal, and construction activities require an NPDES permit.

To streamline the NPDES permit process, the SWRCB has issued statewide general permits that apply to all storm water discharges from certain industrial and construction activities. Of these, the proposed project / proposed action would be subject to the requirements of the NPDES General Permit for Storm Water Discharges Associated with Construction (General Permit).

Section 404

Section 404 of the Clean Water Act regulates the discharge of dredged, excavated, or fill materials in wetlands, streams, rivers, and other United States waters. The United States Army Corps of Engineers is the federal agency responsible for issuing 404 Permits for certain activities conducted in wetlands or other U.S. waters. Section 404 Permits are not granted without a prior 401 certification.

B. Federal Emergency Management Agency

Inyo County is a participant in the National Flood Insurance Program (NFIP), a federal program administered by the Federal Emergency Management Agency (FEMA). Participants in the NFIP must satisfy certain mandated floodplain management criteria. The National Flood Insurance Act of 1968 has adopted, as a desired level of protection, an expectation that developments should be protected from floodwater damage of the Intermediate Regional Flood (IRF). The IRF is defined as a flood that has an average frequency of occurrence on the order of one in 100 years, although such a flood may occur in any given year. Inyo County is occasionally audited by the Department of Water Resources (DWR) to ensure the proper implementation of FEMA floodplain management regulations. The proposed project / proposed action site is located on Flood Insurance Rate Map (FIRM) Map Number 06027C2225D and 06027C2575D, dated effective August 16, 2011.[4]

C. Bishop Resource Management Plan

The Bishop Resource Management Plan provides planning direction for the future use of land in the Bishop Resource Area.[5] The BLM's responsibilities include managing public land and associated natural resources to provide a variety of uses. The BLM predominantly controls the proposed project / proposed action study area. The proposed project / proposed action study area is located within the Owens Lake Management Area and South Inyo Management Area, two of nine management areas managed by the BLM pursuant to the Bishop Resource Management Plan. The proposed dust control

[4] Federal Emergency Management Agency. Flood Insurance Rate Map Number 06027C2225D and 06027C2575D, dated effective August 16, 2011. Available at: http://map1.msc.fema.gov/idms/IntraView.cgi?KEY=49046611&IFIT=1

[5] U.S. Department of the Interior, Bureau of Land Management, Bakersfield District. April 1993. *Bishop Resource Management Plan, Record of Decision*. Bakersfield, CA.

measures (DCMs) would be implemented within the Owens Lake Management Area only. The proposed project / proposed action has been designed in conformance with BLM standard operating procedures for managing the various resources and activities in the management areas, including construction activities within streams will comply with the State Fish and Game Code as to notification and incorporation of appropriate mitigation measures.

Limit vegetation removal and other surface disturbing activities to the minimum required for project implementation. Require soil retaining structures or other special methods as needed to control erosion on steep slopes or unstable soils

BMPs and appropriate mitigation will be identified during project level environmental review and applied during project implementation for any ground disturbing activity that may reduce soil productivity or cause surface erosion or mass wasting.

3.8.1.2 STATE

A. Porter-Cologne Water Quality Control Act (California Water Code Section 13000 et seq.)

Water quality in California is further regulated under the Porter-Cologne Water Quality Control Act. This law assigns responsibility for protection of water quality to the SWRCB, which is divided into nine statewide RWQCBs that enforce water quality standards. The proposed project / proposed action site is subject to the jurisdiction of the Lahontan RWQCB.

B. Section 13050

Waters of the State are defined in Section 13050 of the Porter-Cologne Water Quality Control Act as "any surface water or groundwater, including saline waters, within the boundaries of the state." Water quality criteria include the identification of beneficial uses, narrative and numerical water quality standards, and implementation procedures.

C. Section 13260 California Water Code

Section 13260 of the California Water Code states that persons discharging or proposing to discharge waste that could affect the quality of the waters of the State, other than into a community sewer system, shall file a Report of Waste Discharge (ROWD) with the appropriate RWQCB. Following the filing of a ROWD, if applicable, the RWQCB adopts Waste Discharge Requirements (WDR) specifying water quality limitations for the reported waste discharge. Pursuant to California Water Code 13267, a Monitoring and Reporting Program may be required by the RWQCB as a condition of the WDR.

D. Section 13263

The RWQCBs are authorized to issue Waste Discharge Requirements specifying conditions for protection of water quality in Section 13263.

State Water Resources Control Board Construction General Permit Order No. 2010-0014-DWQ

The SWRCB regulates storm water discharges from projects during construction in accordance with the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (NPDES No. CAS000002). Dischargers whose projects disturb one or more acres of soil or whose projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit Order 2010-2014-DWQ, effective February 14, 2011) (SWRCB, 2011a).

For projects which disturb an area in excess of one acre, it is generally required to file a Notice of Intent (NOI) with the SWRCB to be covered under the State NPDES General Construction Permit for discharges of storm water associated with construction activity. The proposed project / proposed action would be required to develop and implement a Storm Water Pollution Prevention Plan (SWPPP). A SWPPP describes BMPs the discharger will use to protect storm water runoff and reduce potential impacts to surface water quality through the construction period. The SWPPP must contain the following: a visual monitoring program; a chemical monitoring program for non-visible pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges to a water body listed on the 303(d) list for sediment. A BMP is defined by the Stormwater Quality Task Force as any program, technology, process, siting criteria, operating method, measure, or device that controls, prevents, removes, or reduces storm water pollution. The DCMs for the proposed project / proposed action may disturb an area greater than one acre, and consequently would be required to comply with the General Permit.

E. Lahontan Regional Water Quality Control Board Basin Plan

The CWA is administered and enforced by the SWRCB, which develops regulations to execute water quality control programs mandated at the federal and state levels. As stated above, California has nine RWQCBs that implement these water quality programs. The Lahontan RWQCB has prepared a Water Quality Control Plan that includes a combination and revision of two separate Water Quality Control Plans adopted in 1975 for the North and South Lahontan Basins. The proposed project / proposed action site is located within the South Lahontan Basin Plan. The basin plan, which was established under the requirements of California's 1969 Porter-Cologne Water Quality Control Act, was amended several times between 1975 and 2006, and is currently under public review.[6]

3.8.1.3 LOCAL

A. Inyo County Groundwater Ordinance

In 1991, the County adopted an ordinance requiring that any person proposing to transfer water pursuant to California Water Code Section 1810 et seq. first obtain a conditional use permit (CUP). The ordinance required that no permit could be issued unless the County finds that the transfer would not unreasonably affect the overall economy or environment of the County.

[6] California Regional Water Quality Control Board, Lahontan Region. 1994. *Water Quality Control Plan*. Available at: http://www.swrcb.ca.gov/lahontan/water_issues/programs/basin_plan/references.shtml

In 1997, the ordinance was repealed and replaced by a more comprehensive ordinance that applies to any of the following transfers or transports of water:

- A water transfer from the unincorporated area of Inyo County undertaken pursuant to Water Code Section 1810 et seq.

- A sale to the City of Los Angeles or an acquisition by the City of Los Angeles by means other than a sale of surface water or groundwater extracted or diverted from within Inyo County

The ordinance requires any person proposing to undertake a water transfer or transport first obtain a CUP from the County. The ordinance requires that no permit be issued unless the County finds that the transfer will not unreasonably affect the overall economy or environment of the County. The proposed project / proposed action does not involve a groundwater transfer from Inyo County.

B. Inyo County General Plan

The Inyo County General Plan contains the goal to "protect and preserve water resources for the maintenance, enhancement, and restoration of environmental resources." This goal is supported by the following policy relevant to the proposed project / proposed action:[7]

> Policy WR-2, Restoration. Encourage and support the restoration of degraded water surface and groundwater resources

The Inyo County General Plan also contains the goal to "protect and restore environmental resources from the effects of export and withdrawal of water resources." This goal is supported by the following policies relevant to the proposed project / proposed action:[8]

> Policy WR-3.1, Watershed Management. Protect, maintain and enhance watersheds within Inyo County

> Policy WR-3.2, Sustainable Groundwater Withdrawal. The County shall manage the groundwater resources within the County through ordinances; project approvals and agreements; ensure an adequate, safe and economically viable groundwater supply for existing and future development within the County; protect existing groundwater users; maintain and enhance the natural environment; protect the overall economy of the County; and protect groundwater and surface water quality and quantity

3.8.2 AFFECTED ENVIRONMENT

The proposed project / proposed action is located at the southern end of the Owens Valley, an elongated north-south trending valley that is bounded on the west by the Sierra Nevada Mountains, on east by the Inyo and White Mountains, and on the south by the Coso Mountains. The floor of the Owens Valley ranges in elevation from a low of approximately 3,550 feet above mean sea level (MSL)

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[7] Inyo County Planning Department. December 2001. *Inyo County General Plan, Conservation and Open Space Element*. Independence, CA.

[8] Inyo County Planning Department. December 2001. *Inyo County General Plan, Conservation and Open Space Element*. Independence, CA.

on the Owens Lake bed to the south to a high of approximately 4,100 feet above MSL near Bishop to the north. The Owens Valley is a naturally closed hydrologic basin. The LADWP began withdrawing water from the Owens Valley via the Los Angeles Aqueduct in 1913 for export to southern California and subsequently created the current Owens Lake bed. The Owens Lake bed currently consists of a brine pool and open playa, in addition to dust control areas as specified in the 2008 State Implementation Plan.[9]

3.8.2.1 HYDROLOGIC SETTING

The Keeler Dunes are located to the northeast of the Owens Lake bed and northwest of the community of Keeler. The southwestern boundary of the proposed project / proposed action site abuts the historic shoreline of Owens Lake. The western boundary of the proposed project / proposed action is located almost entirely east of the Old State Highway (Figure 2.1.5.1-3, *Geomorphic Map of the Keeler Dunes Area)*. The Owens River enters Owens Lake from the north approximately 4.5 miles northwest of the Keeler Dunes.

The proposed project / proposed action site consists of sand sheets and sand dunes on top of alluvium and ranges in elevation from approximately 3,600 feet above MSL to approximately 3,885 feet above MSL. There is a 285-foot elevation difference between the highest and the lowest area of the proposed project / proposed action site. The general direction of topographic slope is from the Inyo Mountains on the east towards Owens Lake to the west and southwest. The bed of Owens Lake consists of a brine pool (below an elevation of 3,553.53 above MSL) and the playa (that area between the brine pool and the historic shoreline at 3,600 feet above MSL).[10]

In 1950, as part of the realignment of SR 136 the California Department of Public Works Division of Highways (subsequently called the California Department of Transportation [Caltrans]) installed storm water diversion structures on the Keeler Fan east of SR 136 to divert sheet flow resulting from infrequent high magnitude storms[11] (Figure 2.1.5.1-3). The two blue-line drainages that historically passed through the Keeler Dunes as they descended the alluvial fan to their connection with Owens Lake were rerouted to the northern and southern portions of the Keeler Fan by the Caltrans storm water diversion structures. The flow path from the southern diversion structure goes through the proposed project / proposed action site. The flow path from the northern diversion structure cuts through the proposed project / proposed action study area but does not cross the proposed project / proposed action area.

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[9] Great Basin Unified Air Pollution Control District. January 2008. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan*. Bishop, CA.

[10] Sapphos Environmental, Inc. 2008. *Integrated Subsequent Environmental Impact Report*. Prepared for: Great Basin Unified Air Pollution Control District, Bishop, California. Pasadena, CA.

[11] California Department of Transportation, 1950. Final Report for the Construction of a State Highway in Inyo County, From S.P.R.R. Crossing West of Keeler to Soda Plant, Station "C" 491+00 to Station "D" 38+00, Contract 1-9VC27, Road IX –INY-127-C,D. 5.4 Miles. Report by Rice Brothers INC to the State of California Department of Public Works Division of Highways, District IX, Bishop, California.

3.8.2.2 EXISTING HYDROLOGY / DRAINAGE

There are no perennial surface water inflows to the Owens Lake bed from the proposed project / proposed action site (Figure 2.1.5.1-3). The proposed project / proposed action study area consists of alluvial fan, aeolian, lacustrine, and anthropogenic landforms.[12] The surface hydrology of the study area can be described as a system with multiple channels descending the alluvial fan of Slate Canyon (Keeler Fan). Water flows in the northern channel pass through a culvert that crosses under SR 136 and then to the west-northwest towards the bed of Owens Lake. The central and southern channels become active during significant storm events and flow to the Caltrans water diversion structure located east of SR 136 where it is diverted to the south along the diversion structure and continues across the highway, where the southern terminus of the diversion structure meets the highway, and then continues in the ephemeral drainage that is located on the western side of the highway (Figure 2.1.5.1-3) and then through the Keeler Dunes. The blue-line drainage that is shown on the 100-year flood zone map in the Keeler Dunes between the northern and southern termini of the diversion structure has been rendered inactive by the diversion structure (Figure 3.8.2.2-1, *100-Year Flood Zone)*.

The Federal Emergency Management Agency (FEMA) maps show the entirety of the proposed project / proposed action area as being outside the 100-year flood zone (Figure 3.8.2.2-1). The proposed project / proposed action should not be significantly impacted by flood waters from the main (northern) channel of Slate Canyon as long as the Caltrans water diversion structures are successful at diverting flow. The straw bales are proposed to be placed outside the ephemeral drainage that convey flows from the location where the southern terminus of the diversion structure conveys storm water flows across the highway and through the Keeler Dunes.

The Keeler alluvial fan is characterized by active alluvial and aeolian features. Wind and storm water runoff events may alter the existing surficial features. The fan is covered with aeolian deposits that fill in drainage features. Local runoff on the alluvial fan below the Caltrans water diversion structures does not likely generate enough flow to affect the proposed project / proposed action study area.[13]. The main active drainage in the proposed project / proposed action area brings water that is captured by the southern diversion structure and directs it through a series of channels that cross through the Keeler Dunes. No project elements will be constructed within these defined channels.

A. Springs / Uncontrolled Flowing Artesian Wells

There are several springs in the Keeler area (Figure 3.8.2.2-2, *Springs in Study Area Vicinity)*. The main springs are anthropogenic created by the flow of water from uncontrolled flowing artesian wells. None of these springs are located within the project area. The Keeler Spring is located southwest of the community of Keeler and is approximately 0.75 mile from the southern border of the proposed project / proposed action site. The Keeler Spring has a water source that originates from a free-flowing artesian

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[12] Bacon, S.N. and N. Lancaster, November 2012. Geomorphic Mapping of the Keeler Dunefield and Surrounding Areas. Report by the Desert Research Institute prepared for Great Basin Unified Air Pollution Control District. Available at: *http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20D%20-%20Geomorphology/Bacon%20and%20Lancaster%202012_FINAL_REPORT_Geomorphic_Mapping_of_the_Keeler_Dunfield_and_Surrounding_Areas20121114.pdf*

[13] Bacon, S.N. Desert Research Institute. 6 November 2012. Telephone conversation with D. Grotzinger, Sapphos Environmental, Inc. Pasadena, CA.

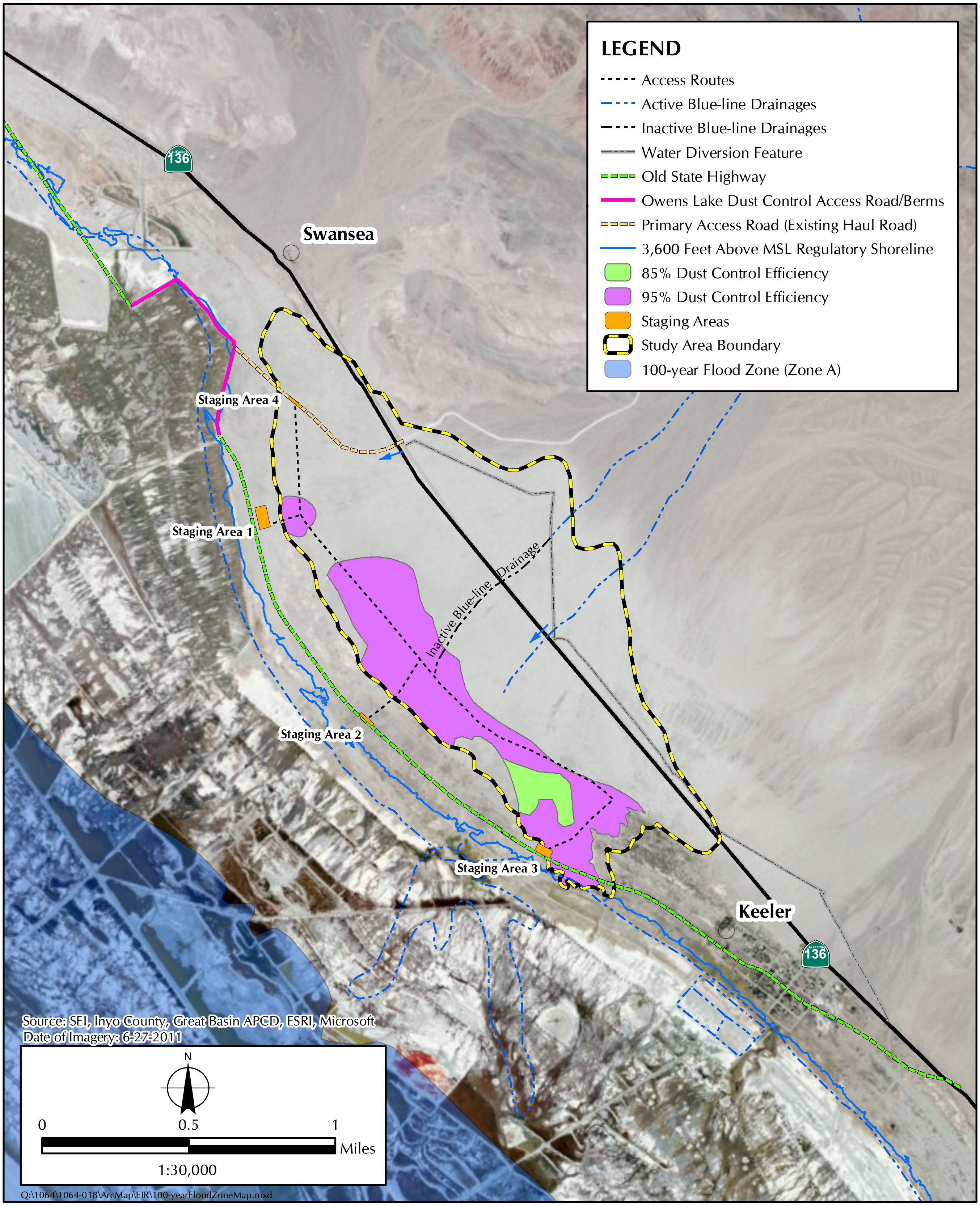

FIGURE 3.8.2.2-1

100-Year Flood Zone Map

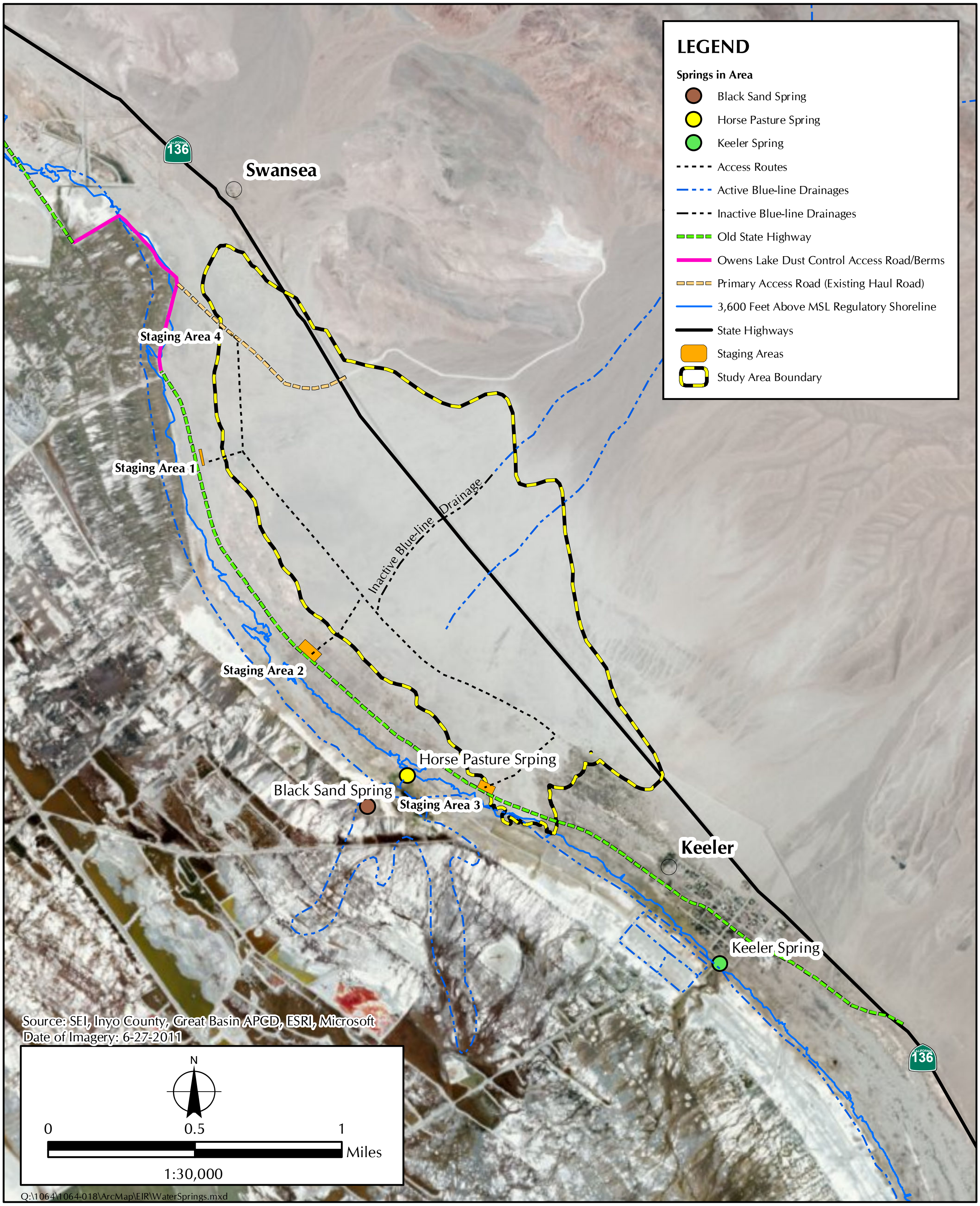

FIGURE 3.8.2.2-2

Springs in Study Area Vicinity

well located adjacent to the old community pool.[14] The exact date of drilling of the Keeler Spring well is unknown but appears to have been in the early 1900s or late 1800s.

In addition to the Keeler Spring, there are two additional spring sites created by human activity that are located outside of proposed project / proposed action site approximately 0.3 mile from the southwestern border and are located within the historic shoreline of Owens Lake. The Black Sand and Horse Pasture springs both result from free-flowing artesian wells that were drilled in the early 1900s.[15]

Beneficial uses listed in the Lahontan RWQCB Basin Plan for the Keeler Spring include municipal and domestic supply, agricultural supply, industrial service supply, groundwater recharge, freshwater replenishment, water contact and noncontact recreation, warm freshwater habitat, cold freshwater habitat, inland saline water habitat, wildlife habitat, and migration of aquatic organisms. Although Owens Lake has been reduced to a dry lake bed and brine pool, the Basin Plan describes beneficial uses for Owens Lake as water contact and non-contact recreation, commercial and sport fishing, warm freshwater habitat, cold freshwater habitat, inland saline water habitat, and wildlife habitat.

3.8.2.3 Existing Flooding

According to the FEMA flood maps, the proposed project / proposed action area is located outside the 100-year flood hazard area (Figure 3.8.2.2-1).[16]

3.8.2.4 Existing Water Quality

The proposed project / proposed action occurs within the Owens Valley Groundwater Basin. The basin inflows are derived from precipitation, surface flows, and subsurface flows and outflows from evaporation, evapotranspiration, spring and seep discharge, surface water diversion, and withdrawal from pumping. Much of the recharge for the basin comes from the Sierras on the west side of the Owens Valley and from the Owens River. The range of overall inflow and outflow in the Owens Valley groundwater basin is estimated to be in the range of 45,000 to 67,500 acre-feet per year.[17] The proposed project / proposed action is located on the northeast side of Owens Lake, west of the Inyo Mountains. Groundwater resources from the Inyo Mountains flow through the sediments of the alluvial fans toward Owens Lake.[18,19]

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[14] Holder, Grace, Great Basin Unified Air Pollution Control District, Bishop, CA. 13 September 2011. Email to Donna Grotzinger, Sapphos Environmental, Inc., Pasadena, CA. Subject: Water Resources in the Keeler Dunes Area.

[15] Records found at the University of Nevada, Reno Special Collection Number 73, reviewed April 2013.

[16] Federal Emergency Management Agency. Flood Insurance Rate Map Number 06027C2225D and 06027C2575D, dated effective August 16, 2011. Available at: http://map1.msc.fema.gov/idms/IntraView.cgi?KEY=49046611&IFIT=1

[17] MWH Americas, Inc. November 2011. "Owens Lake Groundwater Evaluation Project, Updated Conceptual Model Report- FINAL." Prepared for: Los Angeles Department of Water and Power, Los Angeles, CA.

[18] Porter, C. 1984. *Final Environmental Impact Report Inyo Marble*, Appendix E: "Geohydrology Study of the Swansea Alluvial Fan Area for the Proposed Inyo-Marble Development of Dolomite, California." Prepared by: Applied Geotechnical, Reno, NV.

[19] Conway, Chris. 1997. "Observation of Ephemeral Flows and Estimation of Recharge from the Inyo and Coso Mountains, Owens Dry Lake, California." Thesis, University of Nevada, Reno.

The detailed hydrology of the Owens Lake basin has been studied extensively over the past two decades.[20,21,22,23,24,25,26.27,28,29,30] The LADWP initiated the latest investigation, the Owens Lake Groundwater Evaluation Project (OLGEP), in March of 2009 for the purpose of evaluating the groundwater resources below the lake bed as a potential water supply for DCMs on the lake bed. Monitoring well installations were completed by LADWP in 2010 and an updated hydrogeological conceptual model was presented in November 2011. The report concluded that DCMs on the lake bed locally influence shallow groundwater levels but appear to have no effect on the deep wells that were monitored.[31]

The District has conducted an analysis of groundwater beneath the Keeler Dunes utilizing available data from the existing groundwater wells in the area and ground surface elevation data.[32] The results of this analysis indicate that the groundwater elevation does not vary significantly across the study area and is present at an elevation of approximately 3,614 feet above MSL. The depth to groundwater in the dust control areas is estimated to range from a maximum of 70 feet along the eastern side of the proposed project / proposed action to less than 10 feet on the west. The range in groundwater depth across the larger study area is greater ranging from approximately 196 feet on the eastern border (east of SR 136) to within a few feet of the surface along the southwestern border along the historic shoreline.

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[20] Danskin, W.R. 1998. "Evaluation of the Hydrologic System and Selected Water-Management Alternatives in the Owens Valley, California." U.S. Geological Survey Water-Supply Paper 2370. Prepared in cooperation with Inyo County and the Los Angeles Department of Water and Power. Denver, CO: U.S. Geological Survey.

[21] Porter, C. 1984. *Final Environmental Impact Report Inyo Marble*, Appendix E: "Geohydrology Study of the Swansea Alluvial Fan Area for the Proposed Inyo-Marble Development of Dolomite, California." Prepared by: Applied Geotechnical, Reno, NV.

[22] Hollett, K., Danskin, W., McCaffrey, W., and Walti, G. 1991. *Geology and Water Resources of Owens Valley, California*. U.S. Geological Survey Water Supply Paper 2370-B. Denver, CO: U.S. Geological Survey.

[23] Conway, Chris. 1997. "Observation of Ephemeral Flows and Estimation of Recharge from the Inyo and Coso Mountains, Owens Dry Lake, California." Thesis, University of Nevada, Reno.

[24] Schultz, B.W. 1996. *Evaluation of Change in Wetlands at Owens Lake Playa between 1977 and 1992 Using MSS Satellite Imagery and Color Infrared Photography*. Publication No. 41154. Draft Report Submitted to Great Basin Unified Air Pollution Control District, Bishop, CA. Reno, NV: Desert Research Institute.

[25] Wirganowicz, M. 1997. "Numerical Simulation of the Owens Lake Groundwater Basin, California." Unpublished thesis, University of Nevada, Reno.

[26] Great Basin Unified Air Pollution Control District. [2001] Revised 2003. *Archive of Groundwater and Hydrology Data, Owens Lake*. Bishop, CA.

[27] Johnson, K., J. Eliason, G. Maddox, and T. Brooks. 1999. *Characterization of the Owens Lake Basin Hydrology System, Inyo County, California*. Prepared by: Neponset Geophysical Corporation for Great Basin Unified Air Pollution Control District.

[28] Sierra GeoSciences LLC. November, 2002. *Summary of Construction, Analyses and Long Term Monitoring, Keeler/Swansea Site, Owens Lake, Inyo County, California*. Project Number 0211. Final Report prepared for the Great Basin Unified Air Pollution Control District. Bishop, CA..

[29] Great Basin Unified Air Pollution Control District. February 2009. "Owen Lake Shallow Hydrology Monitoring, Data and Chemistry; 1992-2004." Bishop, CA. Available at: http://www.gbuapcd.org/owenslake/hydrology/OwensLakeShallowHydrologyMonitoringDataAndChemistry1992-2004/Final%20Report%20(Compiled%20Text_Figs).pdf

[30] MWH Americas, Inc. November 2011. "Owens Lake Groundwater Evaluation Project, Updated Conceptual Model Report- FINAL." Prepared for: Los Angeles Department of Water and Power, Los Angeles, CA.

[31] MWH Americas, Inc. November 2011. "Owens Lake Groundwater Evaluation Project, Updated Conceptual Model Report- FINAL." Prepared for: Los Angeles Department of Water and Power, Los Angeles, CA.

[32] Great Basin Unified Air Pollution Control District. 2012. Unpublished data. Bishop, CA.

Groundwater pumping from the Owens Valley occurs to supply the potable water needs of nearby communities, as well as the exportation to southern California. The LADWP pumps groundwater from wells located in the Owens Valley. The LADWP's reported total groundwater pumpage in Owens Valley for runoff year April 2011 to April 2012 was 91,728 acre-feet[33]. Although the LADWP has a monitoring well location (DWP-3) within 1-mile of the proposed project / proposed action site, the closest pumped LADWP well is near Lone Pine over 10 miles away from the proposed project / proposed action area[34]. The nearest public water supply well to the proposed project / proposed action site is the Keeler Community Services District Well (KCSDW) located on the east side of SR 136 adjacent to the border of the proposed project / proposed action boundary (Figure 3.8.2.2-2).

An analysis was completed on the groundwater beneath the Keeler Dunes area. This analysis used the elevation of the groundwater beneath the Keeler Fan as estimated from three well sites in the area (Dunn Wells, KCSD Well, and the Keeler-Swansea Well) in comparison to the elevation of the ground surface. Data for the elevation of the ground surface was taken from two sources – the bare earth DEM from the January 2009 LiDAR survey conducted by the LADWP and the 1990's Horizon topographic survey. The vertical resolution on the LiDAR data is 0.5 feet while the resolution on the Horizons data is 5 feet. The more recent higher resolution LiDAR data covers the areas of highest concern and areas that are the most likely to have changed within the past few years due to movement of the dune sands. This high resolution data was not available for the entire area of interest such that in the outlying areas along the north, east and southern portion of the dunes the elevation data from the Horizons survey were used.

From analysis of the available groundwater data it appears that the elevation of the groundwater is essentially constant beneath the study area. A value of 3,614 feet above MSL was used to represent the elevation of the groundwater. A contour map was generated based on the difference in elevation between the surface topography and the elevation of the groundwater with cutoff values of zero and 200 feet.[35]

A. Groundwater Quality

Groundwater quality in the region varies considerably with location. Groundwater directly underlying Owens Lake, west of the proposed project / proposed action, is non-potable due to elevated levels of total dissolved solids (TDS) well above the secondary drinking water standards (1,000 mg/L). Water quality in the springs and seeps that occur along the edges of Owens Lake is of higher quality but is still non-potable.[36] TDS measured in groundwater samples collected from the Fault Test Well located to the northwest of the proposed project / proposed action ranged in value from approximately 761 to

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[33] Jorat, S, Civil Engineer Associate, City of Los Angeles Department of Water and Power. 11 October 2012. Telephone conversation with D. Grotzinger, Sapphos Environmental, Inc., Pasadena, CA.

[34] Final Report of the OLGEP, Available from: www.ladwp.com

[35] Owens Lake Groundwater Evaluation Program. Available from: www.ladwp.com

[36] Great Basin Unified Air Pollution Control District. February 2009. "Owen Lake Shallow Hydrology Monitoring, Data and Chemistry; 1992-2004." Bishop, CA. Available at: http://www.gbuapcd.org/owenslake/hydrology/OwensLakeShallowHydrologyMonitoringDataAndChemistry1992-2004/Final%20Report%20(Compiled%20Text_Figs).pdf. .

1,872 mg/L.[37] Measurements of TDS measured in the nearest public supply well, the KCSDW, average 830 mg/L.[38]

B. Surface Water Quality

As noted above, there are no perennial surface water drainages in the proposed project / proposed action study area. Two surface water bodies within the Lower Owens River Hydrologic Unit, listed in the Basin Plan for the Lahontan Region as having water quality objectives, are located adjacent to the proposed project / proposed action study area. Water quality objectives for the Keeler Spring (0.8 mile south of the proposed project / proposed action) and Owens Lake (Lower Owens River Hydrologic Unit) are listed in the Water Quality Control Plan for the South Lahontan Region (Basin Plan).[39] Specific objectives for these water bodies are included for ammonia, bacteria (Coliform), biostimulatory substances, chemical constituents, chlorine (total residual), color, dissolved oxygen, floating materials, oil and grease, non-degradation of aquatic communities and populations, organochlorine and organophosphate pesticides, pH, radioactivity, sediment, settleable materials, taste and odor, temperature, toxicity, and turbidity.

Electrical conductivity measurements of the Keeler Spring (Figure 3.8.2.2-1) average 1.74 (mS/cm).[40] Electrical conductivity is a measure of water's ability to conduct an electric current and is influenced by the dissolved salts present; therefore, high electrical conductivity measurements indicate a large quantity of dissolved salts. Potable water typically ranges from 0.03 to 1.5 mS/cm.[41] Past measurements of the electrical conductivity of samples from the Black Sand and Horse Pasture springs (Figure 3.8.2.2-2), located southwest of the proposed project / proposed action, average 3.64 and 2.85 mS/cm, respectively.[42]

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[37] Sierra Geosciences, 2002. Summary of Construction, Analyses and Long Term Monitoring. Fault Test Site, Owens Lake, Inyo County, California, prepared for Great Basin Unified Air Pollution Control District. Bishop, CA.

[38] Barton, K., Inyo County Department of Environmental Health Services, Independence, CA. 25 September 2012. Telephone conversation with D. Grotzinger, Sapphos Environmental, Inc., Pasadena, CA.

[39] Lahontan Regional Water Quality Control Board. n.d. *Basin Plan*. Available at: http://www.swrcb.ca.gov/rwqcb6/water_issues/programs/basin_plan/index.shtml

[40] Great Basin Unified Air Pollution Control District. February 2009. "Owen Lake Shallow Hydrology Monitoring, Data and Chemistry; 1992-2004." Bishop, CA. Available at: http://www.gbuapcd.org/owenslake/hydrology/OwensLakeShallowHydrologyMonitoringDataAndChemistry1992-2004/Final%20Report%20(Compiled%20Text_Figs).pdf

[41] Clean Water Team . 2004. "Electrical Conductivity/Salinity Fact Sheet, FS-3.1.3.0(EC)." In *The Clean Water Team Guidance Compendium for Watershed Monitoring and Assessment*, Version 2.0. Sacramento, CA: Division of Water Quality, California State Water Resources Control Board (SWRCB).

[42] Great Basin Unified Air Pollution Control District. February 2009. "Owen Lake Shallow Hydrology Monitoring, Data and Chemistry; 1992-2004." Bishop, CA. Available at: http://www.gbuapcd.org/owenslake/hydrology/OwensLakeShallowHydrologyMonitoringDataAndChemistry1992-2004/Final%20Report%20(Compiled%20Text_Figs).pdf

3.9 LAND USE AND PLANNING

This section describes background discussion of applicable land use plans, policies, regulations, and federal special designations.

3.9.1 REGULATORY FRAMEWORK

3.9.1.1 FEDERAL

A. Federal Land Policy and Management Act, 1976 as Amended

The United States Congress passed the Federal Land Policy and Management Act (FLPMA) in 1976. Title V, "Rights-of-Way," of the FLPMA establishes public land policy, guidelines for administration, provides for management, protection, development, and enhancement of public lands; and provides the BLM authorization to grant right-of-way (ROW).[1] In addition, Section 503 specifically addresses "Right of Way Corridors" and requires common ROWs "to the extent practical."[2] FLPMA, Title V, Section 501(a)(6), states:

> The Secretary with respect to the public lands (including public lands, as defined in section 103(e) of this Act, which are reserved from entry pursuant to section 24 of the Federal Power Act and, the Secretary of Agriculture, with respect to lands within the National Forest System (except in each case land designated as wilderness), are authorized to grant, issue, or renew rights-of-way over, upon, under, or through such lands roads, trails, highways, railroads, canals, tunnels, tramways, airways, livestock driveways, or other means of transportation except where such facilities are constructed and maintained in connection with commercial recreation facilities on lands in the National Forest System.[3]

B. Bishop Resource Management Plan

The BLM's responsibilities include managing its own land and associated natural resources to provide a variety of uses. The Bishop Resource Management Plan (RMP) provides guidance and policies for managing BLM land within nine management areas. The BLM predominantly controls the Keeler Dunes area, which is located within the Owens Lake Management Area and South Inyo Management Area, two of the nine areas managed by the BLM pursuant to the Bishop RMP (Figure 3.9.1.1-1, *Study Area in Relation to the Bishop Resource Management Plan Management Areas*).[4] The proposed DCMs would be implemented within the Owens Lake Management Area, with the exception of the KCSD well tank (Alternative 5), which is located within the South Inyo Management Area. The Bishop RMP's policies and guidelines applicable to the Owens Lake Management Area address preservation and protection of the environment and archaeological artifacts and management of domestic sources of minerals, off-highway vehicle use, grazing, and recreation on public lands.

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[1] *Federal Land Policy and Management Act*. (1976), 43 U.S.C., Title V.

[2] *Federal Land Policy and Management Act*. (1976), 43 U.S.C., Title V, § 503.

[3] *Federal Land Policy and Management Act*. (1976), 43 U.S.C., Title V, § 501(a)(6).

[4] U.S. Department of the Interior, Bureau of Land Management, Bakersfield District. 1993. *Bishop Resource Management Plan Record of Decision*. Bakersfield, CA.

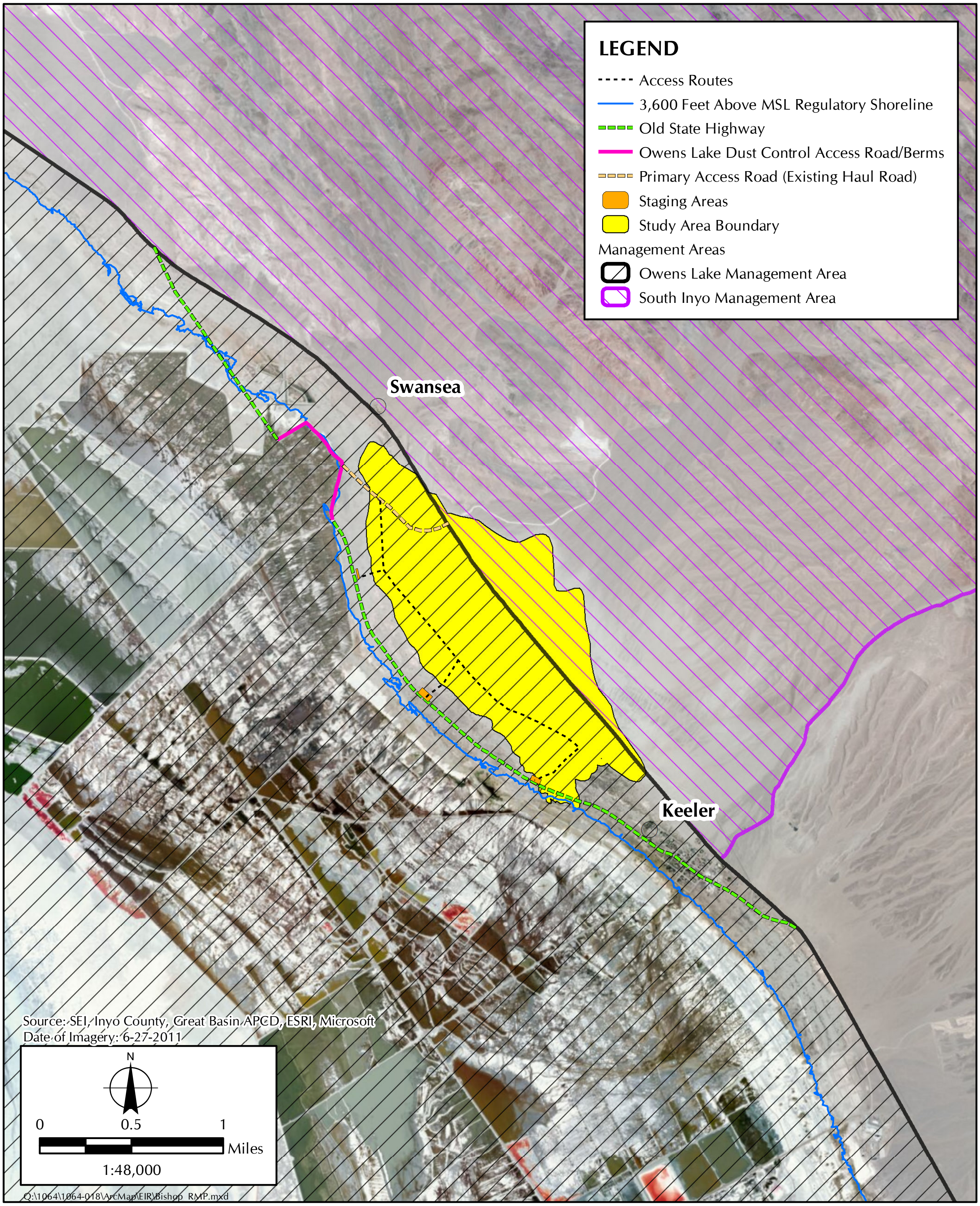

FIGURE 3.9.1.1-1

Study Area in Relation to the Bishop Resource Management Plan Management Areas

3.9.1.2 LOCAL

A. Inyo County General Plan

The Land Use and Conservation and Open Space Elements of the Inyo County General Plan establish goals and policies for the Inyo County land use designations within the proposed project / proposed action study area. The Land Use Element of the Inyo County General Plan designates the proposed project / proposed action study area as State and Federal Lands, Rural Protection, and Natural Resources.[5] These land use designations generally allow for low-intensity agriculture, including grazing, low-impact recreation, and preservation of rural and natural resources.[6] Below are the applicable goals and policies for land use and planning relevant to the proposed project / proposed action.

Land Use Element

Although projects on BLM-administered lands are not required to conform to a locally adopted general plan, the relevant goal and polices from the Land Use Element of the Inyo County General Plan were considered to apprise the District Governing Board of the level of conformance to the general plan. Four policies were considered in the evaluation of land use and planning:

- **Goal LU 5.** Provide adequate public facilities and services for the existing and/or future needs of communities and their surrounding environs, and conserve natural and managed resources.

- **Policy LU 2.95 Rural Protection Designation.** This designation, which is applied to land and water areas that are essentially unimproved and planned to remain open in character, provides for the preservation of natural resources, the managed production of resources, low-intensity agriculture including grazing, parks and other low-intensity recreation, wildlife refuges, hunting and fishing preserves, horse stables, cemeteries, greenbelts, and similar and compatible uses. The minimum parcel size is generally 40 acres. Residential use is limited to one single-family home per 40-acre or larger parcel.

- **Policy LU 5.4 Natural Resources Designation.** This designation, which is applied to land or water areas that are essentially unimproved and planned to remain open in character, provides for the preservation of natural resources, the managed production of resources, and recreational uses.

- **Policy LU 5.6 State and Federal Lands Designation.** This designation applies to those state- and federally owned parks, forests, recreation, and/or management areas that have adopted management plans.

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[5] Inyo County Planning Department. December 2001. *Inyo County General Plan, Land Use Element*. Independence, CA.

[6] Inyo County Planning Department. December 2001. *Inyo County General Plan, Land Use Element*. Independence, CA.

Conservation and Open Space Element

Three goals and five related policies from the Conservation and Open Space Element of the Inyo County General Plan were considered in relation to the proposed project / proposed action:

Soils

- **Goal S-2.** Recognize development limitations of soil types in review and approval of future development projects to protect public health and safety.
- **Policy S-2.1 Soil Erosion.** Minimize soil erosion from wind and water related to new development.

Biological Resources

- **Goal BIO-2.** Provide a balanced approach to resource protection and recreational use of the natural environment.
- **Policy BIO-2.1 Coordination on Management of Adjacent Lands.** Work with other government land management agencies to preserve and protect biological resources while maintaining the ability to utilize and enjoy the natural resources in the County.
- **Policy BIO-2.2 Appropriate Access for Recreation.** Work with other government land management agencies to preserve and protect biological resources while maintaining the ability to utilize and enjoy natural resources in the County.

Recreation

- **Goal REC-1.** Develop a public parks, recreation, and open space system that provides adequate space and facilities to meet the varied needs of County residents and visitors.
- **Policy REC-1.1 Natural Environment as Recreation.** Encourage the use of the natural environment for passive recreational opportunities.
- **Policy REC-1.2 Recreational Opportunities on Federal, State, and the City of Los Angeles Department of Water and Power Lands.** Encourage the continued management of existing recreational areas and open space, and the appropriate expansion of new recreational opportunities on federal, state, and the City of Los Angeles Department of Water and Power (LADWP) lands.

B. Applicable Local Zoning Ordinances

OS-40 Zoning

The County of Inyo Land Use Ordinance provides the physical land use planning criteria, development standards, and zoning regulations for development in the unincorporated areas of the County.

3.9.2 AFFECTED ENVIRONMENT

3.9.2.1 REGIONAL SETTING

The proposed project / proposed action study area is located approximately 10 miles west of the boundary of Death Valley National Park, approximately 11 miles east of the boundary of Sequoia National Park, and approximately 48 miles north of the City of Ridgecrest. The proposed project / proposed action and alternatives are located east of the 110-square-mile (70,000-acre) Owens Lake Bed within the Owens Valley, Inyo County, California (Figure 1.3.1-1, *Regional Vicinity Map*). As described in Section 1.3.1, *Location*, within the 870.6-acre proposed project / proposed action study area, land ownership the majority of land is located on lands administered by the BLM and the balance is located in the unincorporated territory of Inyo County. The DCMs for the proposed project / proposed action and alternatives would occur within the proposed project / proposed action study area limits.

The area to the west of the proposed project / proposed action is largely comprised of lands on the bed of Owens Lake, administered by the California State Lands Commission and being treated with DCMs required pursuant to the 2008 SIP (Figure 3.9.2.1-1, *Existing Land Uses*).[7] The Old State Highway roadbed is also located parallel to the western boundary of the proposed project / proposed action study area, and SR 136 runs through the eastern portion of the proposed project / proposed action study area. One designated Native American reservation (Lone Pine Paiute-Shoshone Indian Reservation) and the town of Lone Pine are approximately 10 miles to the northwest, the community of Swansea is located approximately 1.3 miles to the north, and the community of Keeler is located 1.7 miles to the southeast of the center of the proposed project / proposed action study area.

3.9.2.2 ON-SITE LAND USES

A. Land Ownership

The proposed project / proposed action and action alternatives would be implemented on up to 143.5 acres of Federal land administered by the BLM and 49.5 acres of land owned by the City of Los Angeles, located in the unincorporated portion of Inyo County (Table 3.9.2.2-1, *Summary of Land Ownership in the Proposed Project / Proposed Action Study Area and Dust Control Area*, and Figure 3.9.2.2-1, *Land Ownership in the Study Area*).

TABLE 3.9.2.2-1
SUMMARY OF LAND OWNERSHIP IN THE PROPOSED PROJECT / PROPOSED ACTION STUDY AREA AND DUST CONTROL AREA

Land Owner	Study Area Land Ownership (approximately 870.6 acres)	Dust Control Land Ownership (194 acres)
BLM	778.5	144.5
LADWP	66.7	49.5
Other private/business	1.2	0
State of California ROW	24.1	0

[7] Great Basin Unified Air Pollution Control District. February 2007. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Initial Study*. State Clearinghouse Number 2007021127. Bishop, CA.

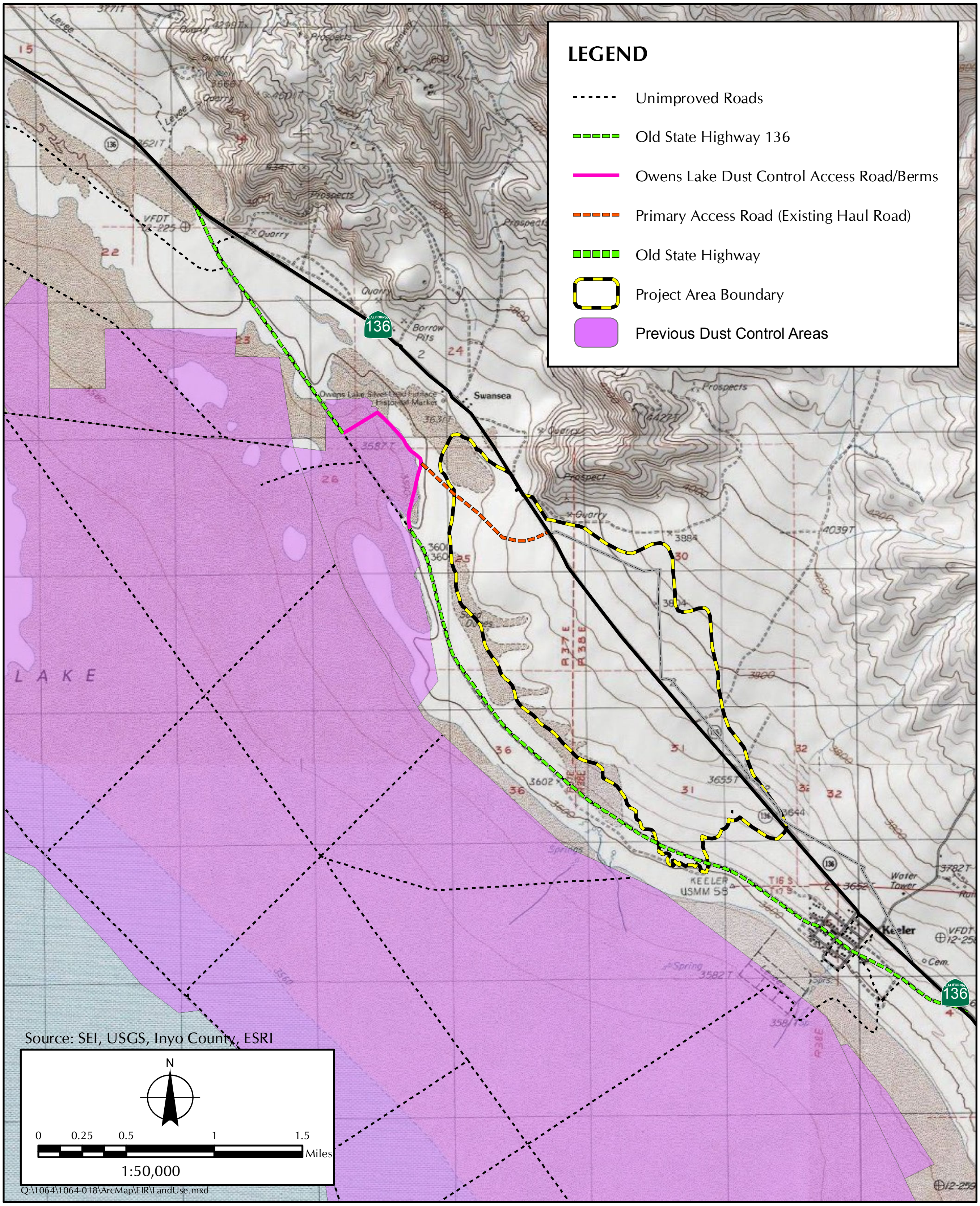

FIGURE 3.9.2.1-1

Existing Land Uses

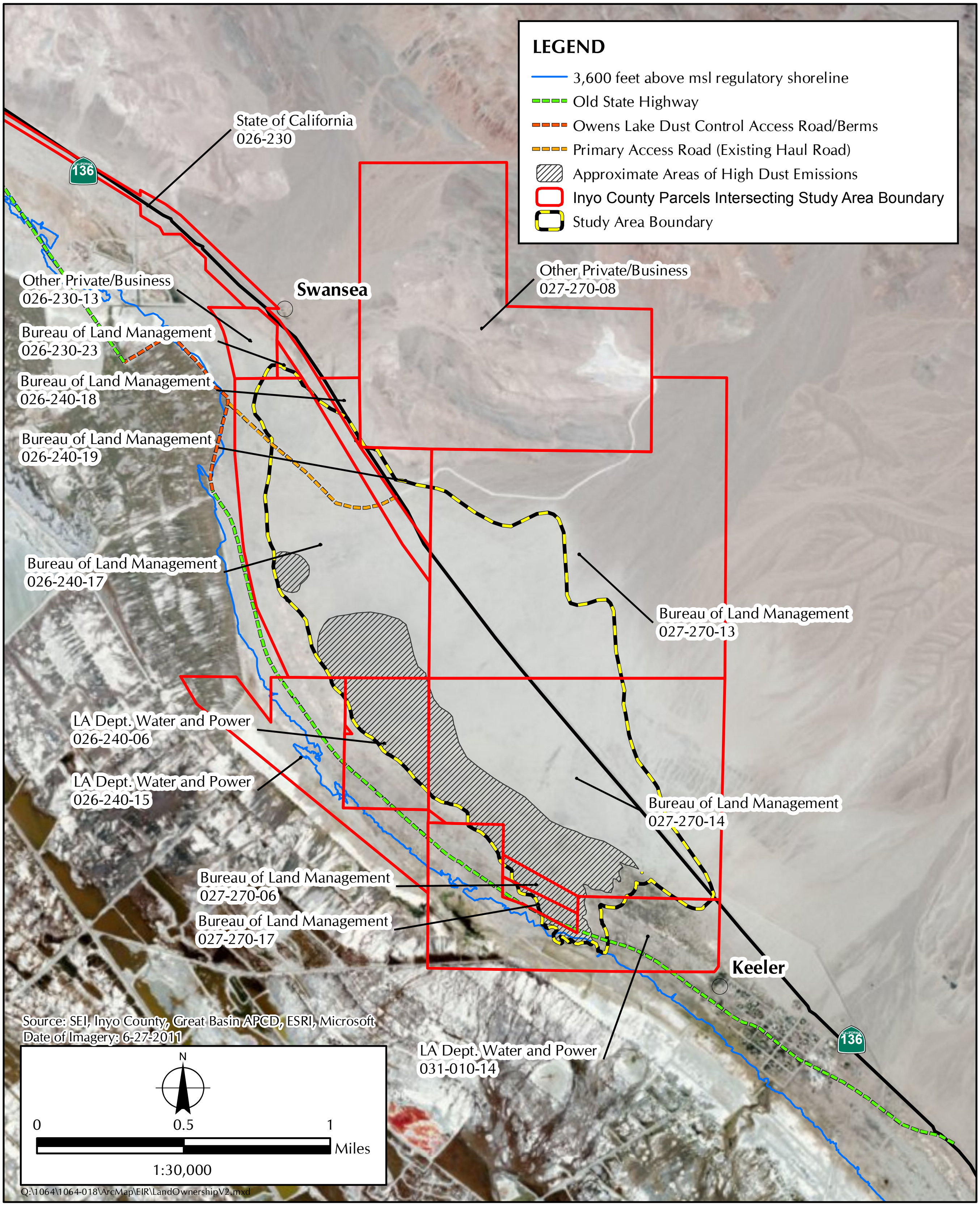

FIGURE 3.9.2.2-1

Land Ownership in the Study Area

B. Inyo County Land Use Designations

While not subject to the local regulatory authority of Inyo County, the Inyo County General Plan recognizes the location of state- and federally owned lands at Keeler Dunes. The Land Use Element of the Inyo County General Plan designates the proposed project / proposed action study area as State and Federal Lands, Natural Resources, and Rural Protection, including the portion administered by BLM.[8]

C. Inyo County Zoning Ordinance

The Inyo County Zoning Ordinance designates the proposed project / proposed action study area as predominantly OS-40, Open Space Zone, and 40-acre minimum lot size.[9] The OS-40 designation encourages the preservation and protection of mountainous, hilly upland, valley, agricultural, potential agricultural, fragile desert areas, and other mandated lands from fire erosion, soil destruction, pollution, and other detrimental effects of intensive land use activities.[10]

D. Existing Land Use

The District has a Sensit network to monitor sand motion, including 16 sand motion monitoring sites located within the proposed project / proposed action study area. District staff collects data and conducts routine maintenance on the Sensit sites. Land use within the proposed project / proposed action study area is characterized by passive recreation use such as walking and wildlife observation by community members from the nearby community of Swansea, community of Keeler, and the Lone Pine Paiute-Shoshone Tribe. The Lone Pine Paiute-Shoshone Tribe uses the area as a sacred site. SR 136 crosses through the study area. Additionally, there are four existing ROWs within the proposed project / proposed action study area consisting of an existing ROW held by LADWP for a 34.5-kilovolt power line (CARI 002605), an existing ROW held by Verizon California Inc. consisting of a telephone line of both aerial and underground cable (CALA 0 087399), a ROW held by the District (CALA 046216) for monitoring sites and activities within the dunes, and a ROW held by the District for the Straw Bale Demonstration Pilot Test Project (CACA 054024). SR 136, held by a Caltrans ROW, is 200 feet from the centerline in width and has been defined on the ground with the concrete edge of ROW monuments. The Southern Pacific Railroad ROW was terminated in 1944 and the management of the land was transferred to the BLM.

[8] Inyo County Planning Department. December 2001. *Inyo County General Plan, Land Use Element*. Independence, CA.

[9] Inyo County. 30 June 2003. "Zoning Ordinance," Title 18, *Inyo County Code*. Independence, CA.

[10] Inyo County. 30 June 2003. "Zoning Ordinance," Title 18, *Inyo County Code*. Independence, CA.

3.10 RECREATION

3.10.1 REGULATORY FRAMEWORK

3.10.1.1 FEDERAL

A. National Environmental Policy Act

The NEPA and its supporting federal regulations establish certain requirements that must be adhered to for any project "financed, assisted, conducted or approved by a federal agency." In making a decision on the issuance of federal grant monies or a permit to conduct work on federal lands for components of the proposed action, the federally designated lead agency pursuant to NEPA is required to "determine whether the proposed action may significantly affect the quality of the human environment." Implementation of the best available control measures under consideration by the District would require a Right-of-Way permit to be issued by the BLM, and thus, an EA has been prepared.

B. Bishop Resource Management Plan

The BLM is the predominant land owner in the Keeler Dunes area. The Keeler Dunes are located within the Owens Lake Management Area and South Inyo Management Area, two of nine management areas managed by the BLM pursuant to the Bishop Resource Management Plan.[1] The proposed DCMs would be implemented within the Owens Lake Management Area, with the exception of the KCSD well tank (Alternative 5), which is located within the South Inyo Management Area. The BLM's responsibilities include managing public land and associated natural resources to provide a variety of uses. Relevant policies include the following:

(1) The Bishop Resource Area will be managed to provide for a variety of dispersed recreation opportunities with an emphasis on primitive, semi-primitive non-motorized and roaded natural experiences.

(2) All BLM lands will be designated as closed, limited, or open to off-highway vehicle (OHV) use. Vehicle use is limited to designated roads and trails.

(3) OHV use will be monitored throughout the resource area. Monitoring efforts will be concentrated in Areas of Critical Environmental Concern, Wilderness Study Areas, other specially designated areas, and areas incurring resource impacts. Mitigation, where needed, will be applied to eliminate or reduce resource problems caused by OHV use.

C. Section 4(f) of the Department of Transportation Act

Section 4(f) of the Department of Transportation Act (recodified at 49 USC 303) analyzes whether a proposed project / proposed action has the potential to result in a "use" of public parks and recreation lands, wildlife and waterfowl refuges, and any historic sites as defined by the Department of

[1] U.S. Department of the Interior, Bureau of Land Management, Bakersfield District. 1993. *Bishop Resource Management Plan Record of Decision*. Bakersfield, CA.

Transportation. Use, within the context of Section 4(f), occurs when a proposed project / proposed action requires a physical taking or other direct control of the land for the purpose of the proposed project / proposed action. Use also includes adverse environmental impacts, also termed constructive use. Constructive use may occur when impacts substantially impair the activities, features, or attributes of the resource that contribute to its significance or its enjoyment. As outlined for the proposed project / proposed action, no such use would be considered applicable for project completion.

3.10.1.2 LOCAL

A. Inyo County General Plan

The Inyo County General Plan contains policies related to recreation in its Conservation and Open Space Element.[2] The Conservation and Open Space Element contains a summary of the existing conditions in the planning area, major issues, and policies designed to aid Inyo County to achieve its goal. Relevant policies include the following:

> **Policy REC-1.1, Natural Environment as Recreation.** Encourage the use of the natural environment for passive recreational opportunities
>
> **Policy REC-1.2, Recreational Opportunities on Federal, State, and LADWP Lands.** Encourage the continued management of existing recreational areas and open space, and appropriate expansion of new recreational opportunities on federal, state, and LADWP lands
>
> **Policy REC-1.5, Distribution of Community Parks.** The County shall ensure that community parks are located to ensure equitable distribution of facilities within the County

B. Lower Owens River Project Plan

Inyo County and the LADWP are actively partnering to create a long-term recreational plan for the Lower Owens River Project (LORP) planning area within a context of ecosystem recovery. The LORP includes land on both sides of the Lower Owens River from the Los Angeles Aqueduct intake north of Independence downstream to the delta leading into Owens Lake, and is one of the largest river ecosystem restoration projects in the nation. The proposed project / proposed action study area is located approximately 3 miles southeast of the eastern boundary of the LORP area.[3] The Draft Lower Owens River Recreation Use Plan was prepared for Inyo County on January 15, 2013, with contributions from LADWP, local residents, tribes, and other stakeholders.[4] The Lower Owens River Recreation Use Plan is intended to "minimize conflicts between recreation users, natural resource conservation, cultural resource protection, water facility operations, and ranching" in the establishment of the Lower Owens River as a recreation destination for local and regional outdoor enthusiasts.[5] The

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[2] Inyo County Planning Department. December 2001. *Inyo County General Plan, Conservation and Open Space Element*. Independence, CA.

[3] Inyo County Water Department. n.d. *Lower Owens River Project*. Available online at: http://www.inyowater.org/LORP/default.htm

[4] Inyo County Water Department. 15 January 2013. *Draft Plan: Lower Owens River Recreation Use Plan*. Available online at: http://www.inyowater.org/LORP/DOCUMENTS/LowerOwensRiver_RecreationUsePlanDRAFT_011513.pdf. Page 27 contains a map, *Preferred Recreation Concept*, for the recreation area.

[5] Inyo County Water Department. January 15, 2013. *Draft Plan: Lower Owens River Recreation Use Plan*. Available online at: http://www.inyowater.org/LORP/DOCUMENTS/LowerOwensRiver_RecreationUsePlanDRAFT_011513.pdf. Page i, Executive Summary.

purpose of the Recreation Use Plan is to support the LORP goals of establishing healthy, functioning ecosystems while providing for the continuation of sustainable uses including recreation, livestock grazing and agriculture while creating opportunities for local residents and visitors to experience recreation, learn about the ecosystem, and become active stewards of the Lower Owens River.[6,7]

3.10.2 AFFECTED ENVIRONMENT

3.10.2.1 FEDERAL RECREATION

The proposed project / proposed action study area is located approximately 10 miles west of the boundary of Death Valley National Park, approximately 20 miles southeast of the Manzanar National Historic Site, and approximately 11 miles east of the boundary of Sequoia National Park. The proposed project / proposed action study area is largely located on lands administered by the BLM.

There are many federal lands located in the general project vicinity including the Inyo National Forest, Sequoia National Forest, Domeland Wilderness, South Sierra Wilderness, Golden Trout Wilderness, Coso Range Wilderness, Monarch Wilderness, Jennie Lakes Wilderness, Inyo Mountains Wilderness, Sequoia National Park, Kings Canyon National Park, and Death Valley National Park. These surrounding National Forest wilderness areas, National Parks, and National Forest areas provide numerous recreational opportunities including but not limited to hiking, backpacking, horse packing, mountain biking, winter recreation, and ORV use (Figure 1.3.1-1, *Regional Vicinity Map*).

3.10.2.2 COUNTY RECREATION

The proposed project / proposed action study area is located within an unincorporated area of Inyo County. Within Inyo County there are 11 county-run campgrounds and seven county parks, among other recreational areas and facilities.[8] There are 18 public recreational areas within a 1-hour travel time of the proposed project / proposed action. These areas provide access to many types of generally passive recreation. Three of these areas are managed by the BLM, nine are managed by Inyo County, two are managed by the National Park Service (NPS), and four are managed by the U.S. Forest Service (USFS) (Table 3.10.2.2-1, *List of Public Recreation Areas within a 1-Hour Travel Time of the Proposed Project / Proposed Action*).

There are no parks of national, state, or historic nature within a 10-mile radius of the proposed project / proposed action study area. There are no designated parks or recreational facilities within the community of Keeler.

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[6] Inyo County Water Department. 1997. *Memorandum of Understanding*. Available at: http://www.inyowater.org/LORP/DOCUMENTS/1997MOU.pdf

[7] Inyo County Water Department. 15 January 2013. *Draft Plan: Lower Owens River Recreation Use Plan*. Available online at: http://www.inyowater.org/LORP/DOCUMENTS/LowerOwensRiver_RecreationUsePlanDRAFT_011513.pdf. Page 3, Section 1.2 Purpose of the Recreation Use Plan.

[8] Inyo County Department of Parks and Recreation. 2008. *Parks and Recreation*. Available at: http://www.inyocounty.us/campgrounds/index.htm

TABLE 3.10.2.2-1
LIST OF PUBLIC RECREATION AREAS WITHIN A 1-HOUR TRAVEL TIME OF THE PROPOSED PROJECT / PROPOSED ACTION

Name	Agency Management	Driving Time from the Proposed Project / Proposed Action in Minutes	Linear Distance from the Proposed Project / Proposed Action in Miles
Alabama Hills Recreation Area	BLM	25–31	11
Tuttle Creek Campground	BLM	29–34	13
Goodale Creek Campground	BLM	49–53	39.5
Dirty Socks Hot Springs	Inyo County	17–19	11.5
Diaz Lake Recreation Area	Inyo County	12–20	9
Mendenhall Park	Inyo County	55–60	51
Taboose Creek Campground	Inyo County	50–51	39.5
Dehy Park	Inyo County	33–34	26
Tinnemaha Campground	Inyo County	54–59	43.5
Portagee Joe Campground	Inyo County	16–19	11
Spainhower Park	Inyo County	14–17	11
Independence Creek Campground	Inyo County	30–35	25.5
Death Valley National Park Boundary	NPS	23–25	17
Manzanar National Historic Site	NPS	24–29	20
Whitney Portal	USFS	39–47	18.5
Onion Valley Road Trailhead	USFS	45–48	27.5
Horseshoe Meadows Road Trailhead	USFS	52–60	13
Kennedy Meadows Trailheads, Campground	USFS	42–103	31.5

Four county-managed recreational areas, one USFS-managed recreational area, and two BLM-managed recreational areas are located within a 15-mile radius of the proposed project / proposed action study area (Figure 3.10.2.2-1, *Nearest Recreational Facilities to the Study Area*):

> The nearest recreational park to the proposed project / proposed action study area is the Diaz Lake Recreation Area, located approximately 9 miles northwest of the proposed project / proposed action study area (a 12–20 minute drive) near the town of Lone Pine. Recreational activities in and around Diaz Lake include swimming, fishing, water skiing, picnicking, boating, grilling, use of play equipment, and camping.[9]
>
> The second nearest recreational area is Spainhower Park, located approximately 11 miles northwest of the proposed project / proposed action study area (a 14–17 minute drive). Formerly called Lone Pine Park, recreational facilities within this park include a lawn area,

[9] Inyo County Parks & Recreation. 2012. *Diaz Lake Campground*. Website. Available online at http://www.inyocountycamping.com/diaz_lake_campground.html

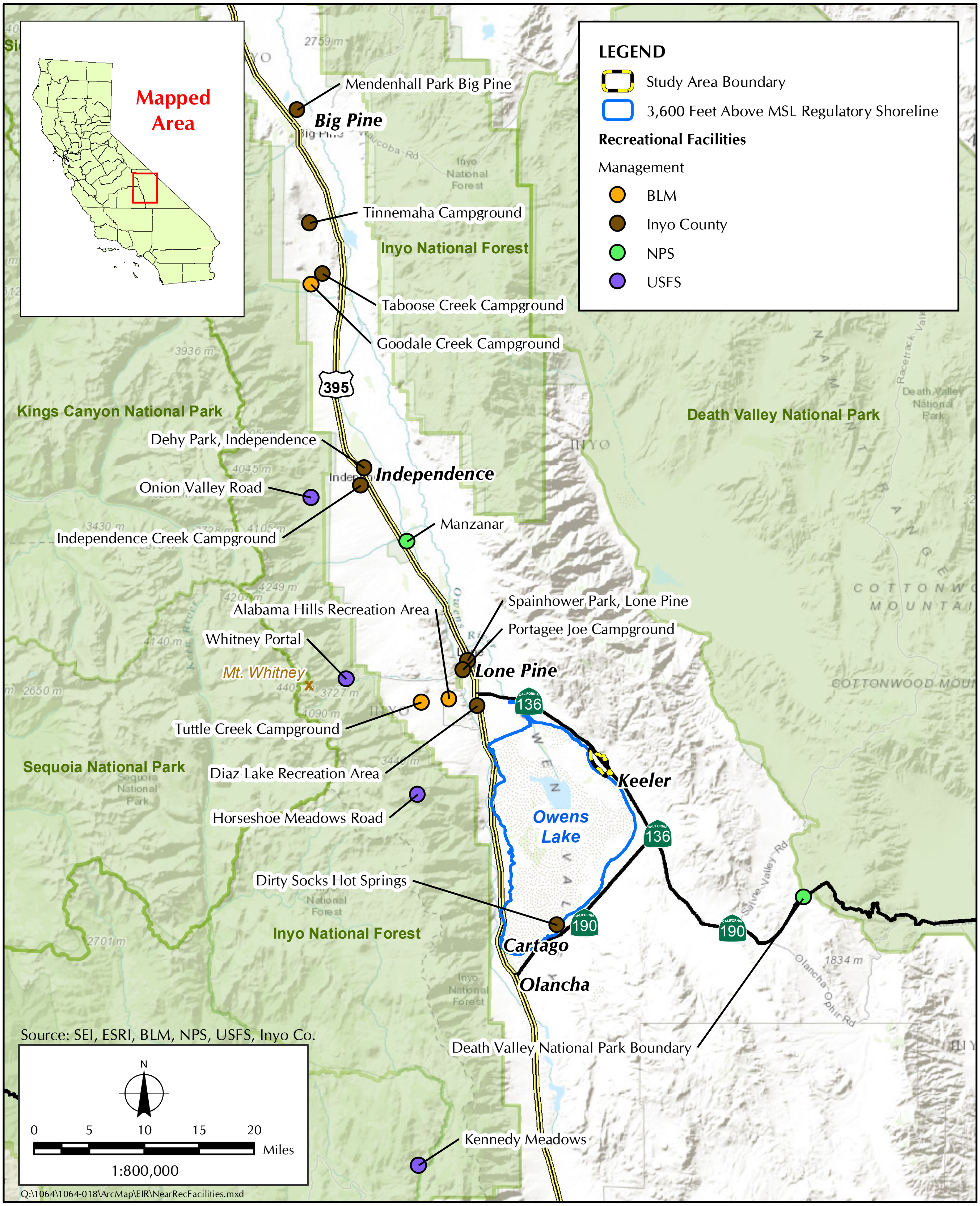

FIGURE 3.10.2.2-1

Nearest Recreation Facilities to the Study Area tennis and basketball courts, play equipment, a horseshoe-pitching area, a gazebo, and a creek running through the park.[10]

The third nearest recreational area is Portagee Joe Campground, located approximately 11 miles northwest of the proposed project / proposed action study area (a 16–19 minute drive). Portagee Joe Campground provides amenities including vault toilets, grills, potable water, fire rings, a stream, 15 camp spaces, and space to accommodate RVs.[11]

The fourth nearest recreational area is the BLM-managed Alabama Hills Recreation Area, located approximately 11 miles northwest of the proposed project / proposed action study area (a 25–31 minute drive). Recreational activities in and around the Alabama Hills Recreation Area include motor touring, photography, rock climbing, hiking, and wildflower viewing.[12]

The fifth nearest recreational area is the Dirty Socks Hot Springs, located 11.5 miles southwest of the proposed project / proposed action study area (a 17–19 minute drive). Recreational activities in and around the Dirty Socks Hot Springs include birding and wildlife viewing, bird hunting, photography, off-road vehicles, and rock collecting.[13]

The sixth nearest recreational area is Tuttle Creek Campground, located approximately 13 miles northwest of the proposed project / proposed action study area (a 29–34 minute drive). Recreational activities in and around Tuttle Creek Campground include exploring, hiking, sightseeing, and camping.[14]

The seventh nearest recreational area is the Horseshoe Meadows Road Trailhead, located approximately 13 miles west of the proposed project / proposed action study area (a 52–60 minute drive). The trailhead leads to Horseshoe Meadow Area in Inyo National Forest, which contains three campgrounds, and recreational activities in and around Horseshoe Meadow Area include camping, climbing, fishing, hiking, horse riding, and picnicking.[15]

The Keeler Dunes are located primarily on lands owned and administered by the BLM and where, according to the BLM Bishop Resource Management Plan, passive recreation is an allowable use. While the general vicinity is known for passive recreation and OHV use, the Bishop Resource Management Plan states that all BLM lands are to be designated as closed and/or limited to OHV use.[16] The Keeler Dunes are closed to OHV use. Residents of the community of Keeler use the Keeler Dunes

[10] Inyo County Parks & Recreation. 2012. *Spainhower Park (formerly Lone Pine Park)*. Website. Available online at: http://www.inyocountycamping.com/lone_pine_park.html

[11] Inyo County Parks & Recreation. 2012. *Portagee Joe Campground*. Website. Available online at: http://www.inyocountycamping.com/portagee_joe_campground.html

[12] U.S. Department of the Interior, Bureau of Land Management. 1 April 2013. *The Alabama Hills*. Website. Available online at: http://www.blm.gov/ca/st/en/fo/bishop/scenic_byways/alabamas.html

[13] City of Los Angeles Department of Water and Power. August 2001. *Mitigated Negative Declaration Southern Zones Dust Control Project, Owens Lake Dust Mitigation Program, Owens Lake, California*. Prepared by: CH2M Hill, Santa Ana, CA.

[14] U.S. Department of the Interior, Bureau of Land Management. 22 October 2013. *Tuttle Creek Campground*. Website. Available online at: http://www.blm.gov/ca/st/en/fo/bishop/camping/tuttle.html

[15] U.S. Forest Service. n.d. *Inyo National Forest: Horseshoe Meadow Area*. Website. Available online at: http://www.fs.usda.gov/recarea/inyo/recreation/camping-cabins/recarea/?recid=20700&actid=29

[16] U.S. Department of the Interior, Bureau of Land Management. April 1993. *Bishop Resource Management Plan, Record of Decision*. Bishop, CA.

for hiking, dog-walking, and other low-impact recreational activities.[17] In addition, there are historic mining towns and smelter sites in the vicinity (Swansea and Cerro Gordo) of the proposed project / proposed action study area that are popular destinations for visitors to the Owens Valley (Figure 3.10.2.2-2, *Historic Mining Towns and Smelter Sites*).

The proposed project / proposed action study area abuts the eastern shoreline of the bed of Owens Lake. The lake bed is included in LADWP's proposed Owens Lake Master Project, which has the goal of maintaining the existing habitat for designated bird guilds while reducing water use while meeting all dust control requirements.[18] Additionally, land near the delta on the lake bed and on both sides of the Lower Owens River is being evaluated for opportunities and constraints regarding recreational activities, such as fishing, non-motorized boating, birding and wildlife viewing, swimming and tubing, water fowl hunting, picnicking and camping, hiking/walking, scenic driving and road biking, mountain biking, historical and cultural tourism, and volunteer stewardship and environmental education (Figure 3.10.2.2-3, *Study Area in Relation to the Lower Owens River Project Planning Area*).

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[17] Sapphos Environmental, Inc. 12 July 2011. Memorandum for the Record No. 1. Subject: Summary of the June 29, 2011, Project Kickoff Meeting for the Keeler Dunes Environmental Impact Report / Environmental Impact Statement. Pasadena, CA.

[18] Los Angeles Department of Water and Power. April 2013. *Owens Lake Master Project*. Available from: http://www.ladwpnews.com/go/doc/1475/1750407/

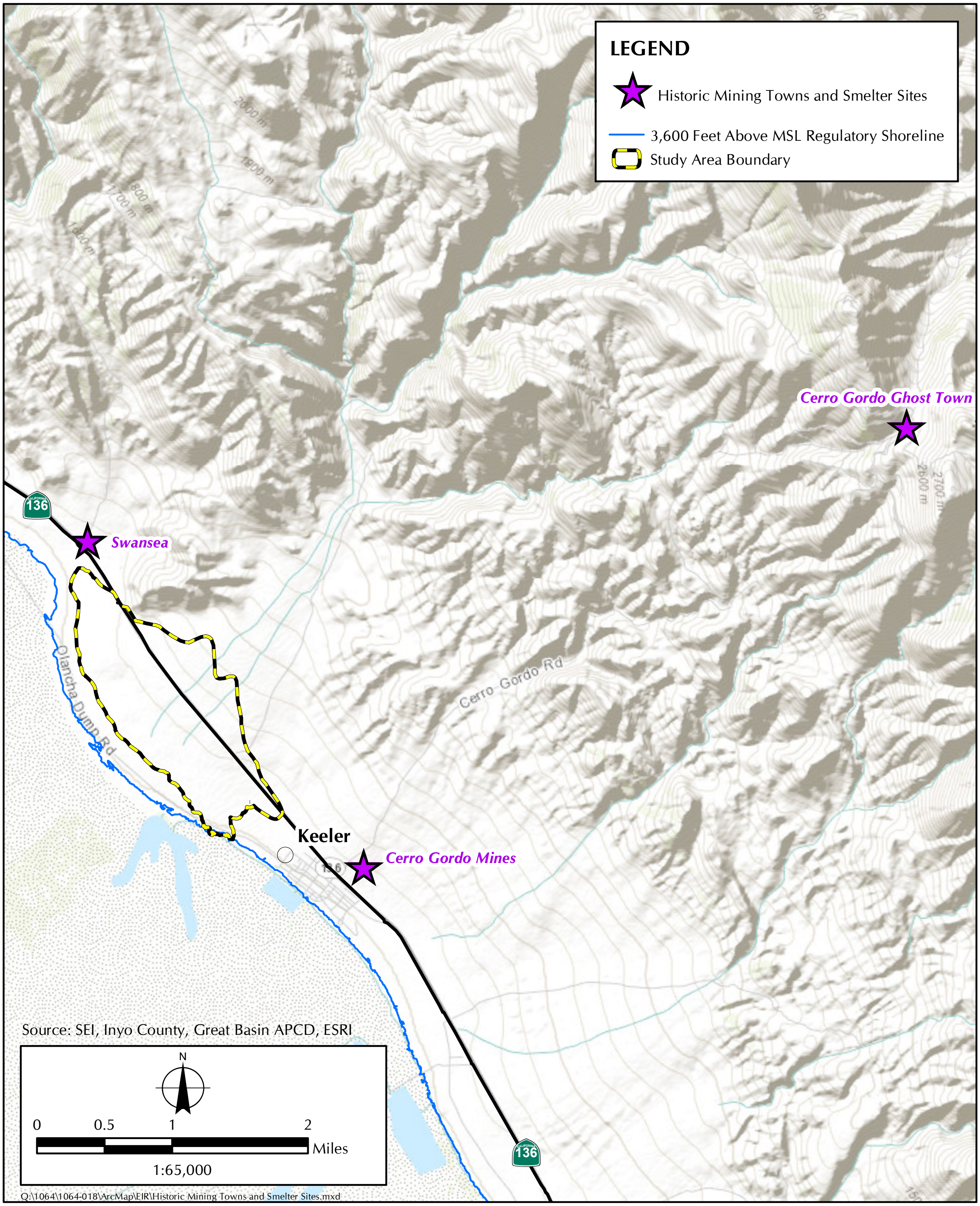

FIGURE 3.10.2.2-2
Historic Mining Towns and Smelter Sites

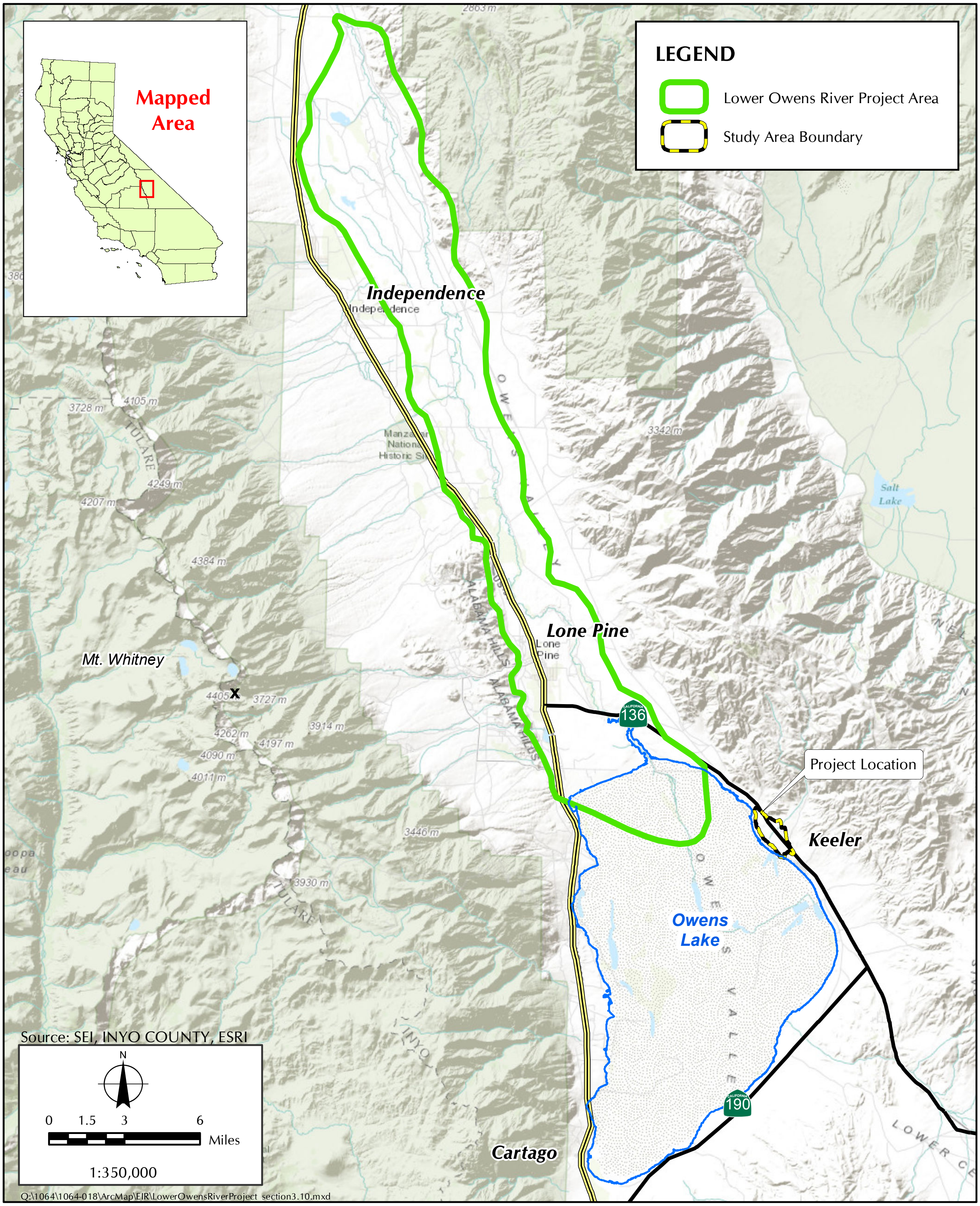

FIGURE 3.10.2.2-3

Study Area in Relation to the
Lower Owens River Project Planning Area

3.11 TRANSPORTATION AND TRAFFIC

3.11.1 REGULATORY FRAMEWORK

3.11.1.1 STATE

A. California Department of Transportation

The State of California Department of Transportation (Caltrans) is responsible for the design, construction, maintenance, and operation of the California State Highway System. Caltrans is also responsible for portions of the Interstate Highway System within the state's boundaries. Caltrans has jurisdiction over state highway right-of-way and has the authority to issue permits for work and encroachment (temporary or permanent) in these areas, and review of traffic control plans.

B. California Water Code

The proposed project / proposed action is subject to the State of California Water Code, Division 12, Part 5, Chapter 1, Article 4, Section 31060, titled "Construction of Rights of Way."[1] Any mitigation measure required to be implemented in a state right-of-way would require a Caltrans Encroachment Permit. Mitigation in excess of $300,000 would require a Caltrans Project Study Report. Caltrans recommends that large-sized trucks transporting construction materials and equipment be limited to off-peak commute periods and any heavy construction equipment that requires the use of oversize transport vehicles on state roadways or facilities would require a Caltrans transportation permit. The construction scenario defined for the proposed project / proposed action would not require the transport of oversize vehicles on state facilities.

3.11.1.2 LOCAL

The Inyo County Regional Transportation Plan (RTP) is a planning document developed in cooperation with Caltrans and other stakeholders to address long-range transportation planning within the County.

The RTP identifies the transportation needs of Inyo County and specifies a course of action that Inyo County policymakers should pursue to achieve a balanced transportation system for both people and goods.[2] This document has a short-term horizon of up to 10 years and a long-term horizon of 20 years. Local, state, and federal agencies with jurisdiction over the quality of Inyo County's transportation system use the RTP as a tool in policy design. Potentially the most relevant policy from the RTP is the following:

> *Policy 2.1.2, Safer Truck Transportation*. Facilitate safer truck transportation and ease the impact of truck traffic on residential areas

The Inyo County General Plan Circulation Element addresses issues related to roadways and highways within the County, as well as the movement of people, products, and materials using a variety of conveyances, from roads to railroads, and bicycle paths to transmission lines.[3]

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[1] *West's Annotated California Codes*. 1984. Volume 69, "Water Code Sections 30000 to 38999. Official California Water Code Classification." St. Paul, MN: West.

[2] Inyo County Local Transportation Commission. 22 April 2009. *Inyo County Regional Transportation Plan*. Independence, CA.

[3] Inyo County Planning Department. December 2001. *Inyo County General Plan, Circulation*. Independence, CA.

The following goals and policies are relevant to the proposed project / proposed action:

> *Goal RH-1*. A transportation system that is safe, efficient, and comfortable, which meets the needs of people and goods and enhances the lifestyle of the County's residents
>
> > Policy RH-1.3 Safer Truck Transportation. Facilitate safer truck transportation and ease the impact of truck traffic on residential areas
> >
> > Policy RH-1.4 Level of Service. Maintain a minimum level of service (LOS) "C" on all roadways in the County. For highways within the County, LOS "C" should be maintained except where roadways expansions or reconfigurations would adversely impact the small community character and economic viability of designated Central Business Districts.
> >
> > Policy RH-1.5 Proper Access. Provide proper access to residential, commercial, and industrial areas
> >
> > Policy RH-1.6 Minimize Environmental Impacts. Ensure that all transportation projects minimize adverse effects on the environment of the County

3.11.2 AFFECTED ENVIRONMENT

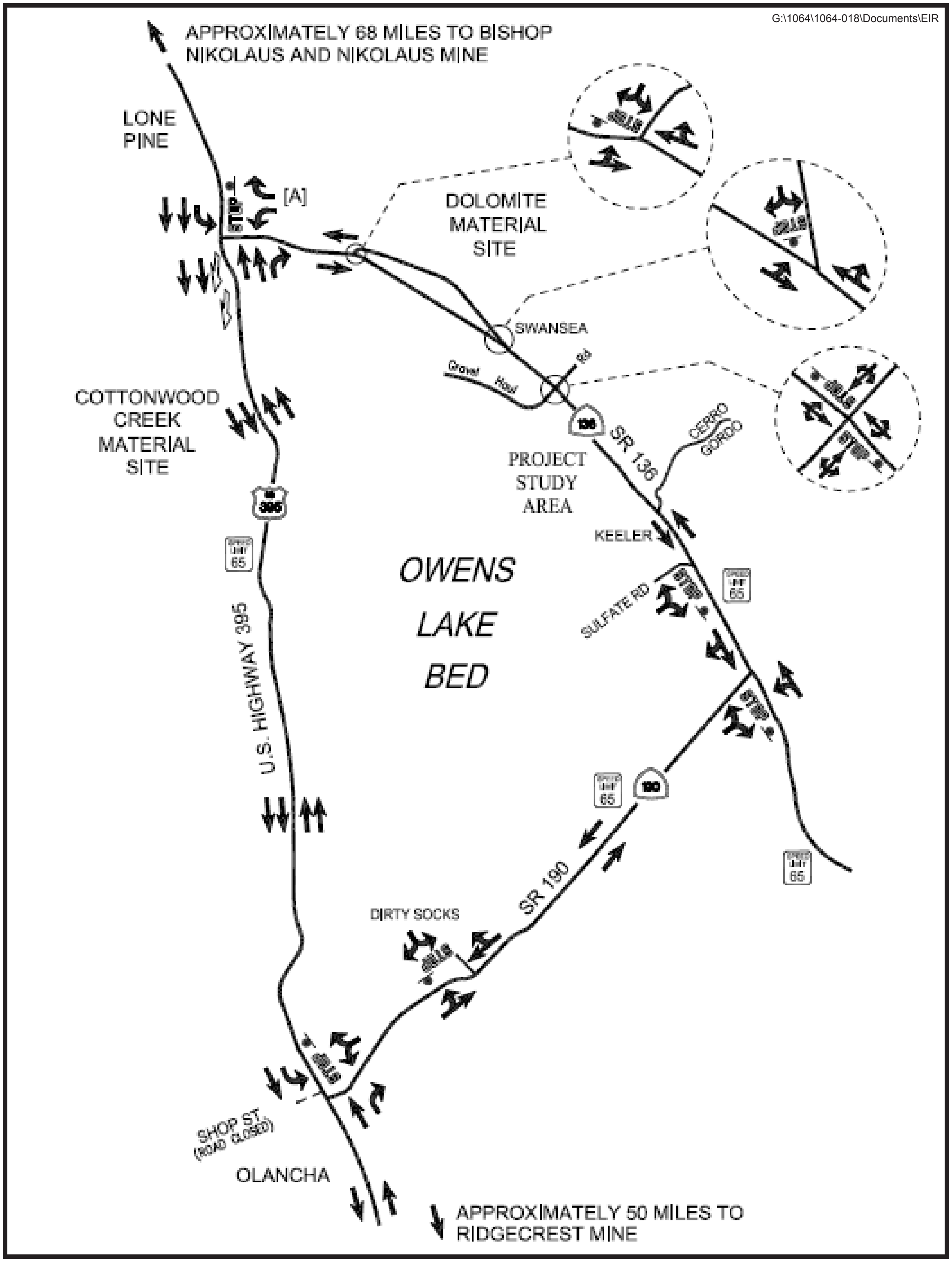
Information contained in this section is summarized from the *Traffic Impact Study* prepared by Linscott, Law, & Greenspan Engineers. This document is provided as Appendix H of this EIR/EA.

3.11.2.1 EXISTING CIRCULATION ELEMENTS

Access to the site from the west is from U.S. Highway 395 via State Route (SR) 136 on the north or from the U.S. Highway 395 via SR 190 from the south, or from SR 190 via SR 136 from the east (as shown in Figure 1.3.1-1, *Regional Vicinity Map*). There are three additional roadways that provide access to the proposed project / proposed action area (Figure 2.1.5.2-2, *Location of Infrastructure Elements Common to All Action Alternatives*): (1) the Old State Highway alignment parallel to the western boundary of the proposed project / proposed action study area; (2) the Owens Lake Dust Control Access Roads/Berm northwest of the proposed project / proposed action study area; and (3) the primary access route into the proposed project / proposed action study area is an existing dirt road used to haul gravel to the Owens Lake bed dust control proposed project / proposed action (haul road). Both the Old State Highway and existing dirt road used to haul gravel are unpaved access routes. The Old State Highway provides site access from the north, while the existing dirt road provides site access from the east.

A. U.S. Highway 395

U.S. Highway 395 is the main transportation route through Inyo County. U.S. Highway 395 is included on the Inter-Regional Road System and is functionally classified as Rural Principal Arterial (Figure 3.11.2.1-1, *Existing Roadway Conditions*). The highway connects the proposed project / proposed action study area with Mono County and Reno to the north and the Southern California metropolitan area to the south. Adjacent to the Owens Lake bed, the majority of U.S. Highway 395 is a divided four-lane expressway with a posted speed limit of 65 mph. U.S. Highway 395 is a major highway used by commercial traffic traveling within the Owens Valley and by recreational traffic traveling around Southern California and the Sierra Nevada Mountain Range. In the Cartago/Olancha area, U.S. Highway 395 transitions from a four-lane highway to a two-lane highway.



LINSCOTT LAW & GREENSPAN engineers

FIGURE 3.11.2.1-1
Existing Roadway Conditions

At the U.S. Highway 395 intersection with SR 136, one exclusive left-turn lane and two through lanes are provided at the southbound approach on U.S. Highway 395. Two through lanes and a channelized right-turn-only lane are provided at the northbound approach on U.S. Highway 395. A southbound departure auxiliary lane is also provided for the westbound left-turn movement from SR 136 to southbound on U.S. Highway 395. Twelve-foot-wide lanes with paved shoulders are provided in each direction on U.S. Highway 395 near the SR 136 intersection and in the proposed project / proposed action vicinity. The posted speed limit along U.S. Highway 395 at SR 136 varies from 55 mph south of intersection to 45 mph both north and south of the intersection.

At the U.S. Highway 395 intersection with SR 190, one exclusive left-turn lane and one through lane are provided at the southbound approach on U.S. Highway 395. One through lane and one channelized right-turn-only lane are provided at the northbound approach on U.S. Highway 395. Twelve-foot-wide lanes with paved shoulders are provided in each direction on U.S. Highway 395 near the SR 190 intersection and in the proposed project / proposed action vicinity. The posted speed limit along U.S. Highway 395 at SR 190 is 55 mph just north of the intersection.

It is noted that the two-lane portion (i.e., one lane in each direction) of U.S. Highway 395 near Cartago/Olancha is planned to be improved to four lanes.[4] Caltrans plans to convert approximately 12.6 miles of the existing U.S. Highway 395 from a two-lane conventional highway into a four-lane expressway or partial conventional four-lane highway from post mile 29.2 to post mile 41.8 in Inyo County. The new facility would have four 12-foot lanes with a variable median width and paved shoulders.

B. State Route 136

SR 136 is a two-lane conventional highway that is classified as a Minor Arterial (two- to four-lane streets that service local and commute traffic), providing access to the historic sites of Dolomite, the community of Swansea, and the community of Keeler. Primary access to the north and eastern portions of the Owens Lake bed also is provided via SR 136. SR 136 runs northwest to southeast between U.S. Highway 395 to the north and SR 190 to the south. Twelve-foot-wide lanes with unimproved gravel shoulders are provided in each direction in the proposed project / proposed action vicinity. The posted speed limit is 65 mph. The existing roadway configuration of SR 136 is shown in Figure 3.11.2.1-1.

At the SR 136 intersection with U.S. Highway 395, which is a "Tee" intersection, a one-way stop sign control is provided at the westbound approach on SR 136. One left-turn lane and one channelized right-turn-only lane are provided at the westbound approach on SR 136 at the U.S. Highway 395 intersection.

At the SR 136 intersection with SR 190, which is another "Tee" intersection, a one-way stop sign control is provided at the eastbound approach on SR 190. One combination through/right-turn lane and one combination left-turn/through lane are provided at the southbound and northbound approaches on SR 136, respectively, at the SR 190 intersection.

C. State Route 190

SR 190 is an interregional two-lane conventional highway that is classified as Minor Arterial, which provides access from U.S. Highway 395 at the eastern flank of the Sierra Nevada Mountains to SR 127

[4] U.S. Department of Transportation, Federal Highway Administration and the State of California Department of Transportation. August 2010. *Olancha/Cartago Four-Lane Project, Initial Study with Proposed Mitigated Negative Declaration/Environmental Assessment*. Washington, DC, and Sacramento, CA.

at Death Valley Junction near the California-Nevada border. SR 190 is a two-lane highway that is oriented southwest to northeast between U.S. Highway 395 to the west and SR 136 to the east and then is oriented to the southeast from the SR 136 intersection. Twelve-foot-wide lanes with unimproved gravel shoulders are provided in each direction on SR 190 in the proposed project / proposed action vicinity. Primary access to the southern portions of the Owens Lake bed is provided via SR 190. The posted speed limit along SR 190 is 65 mph. The existing roadway configuration of SR 190 is shown in Figure 3.11.2.1-1.

At the SR 190 intersection with U.S. Highway 395, stop control is provided at the westbound approach on SR 190 and the west leg of the intersection is closed. One combination left-turn/right-turn lane is provided at the westbound approach on SR 190 at the U.S. Highway 395 intersection.

At the SR 190 intersection with SR 136, which is a "Tee" intersection, a one-way stop sign control is provided at the eastbound approach on SR 190. One combination left-turn/right-turn lane is provided at the eastbound approach on SR 190 at the SR 136 intersection.

3.11.2.2 EXISTING LEVEL OF SERVICE

A. Vehicular Traffic

Recent traffic counts for U.S. Highway 395, SR 136, and SR 190 in the proposed project / proposed action vicinity were researched from data provided in *2011 Traffic Volumes on California State Highway System*, which was published by Caltrans in August 2012 (Figure 3.11.2.2-1, *Existing Year 2011 Annual ADT Volumes*).[5] The Annual Average Daily Traffic (AADT) is the total traffic volume for the year divided by 365 days.

U.S. Highway 395 Traffic Volumes

The AADT volume on U.S. Highway 395 between SR 136 and SR 190 varies between 5,450 and 5,860 vehicles per day, respectively, with a peak hour traffic volume of approximately 1,100 vehicles (year 2011 traffic volumes adjusted to reflect year 2012 conditions). This AADT volume is well below the capacity of the four-lane section of the highway, extending between SR 136 and SR 190.

State Route 136 Traffic Volumes

The AADT along SR 136 ranges from approximately 545 vehicles east of U.S. Highway 395 to approximately 435 vehicles near SR 190 at the Olancha cutoff (year 2011 traffic volumes adjusted to reflect year 2012 conditions). The peak hour traffic volume at both of these locations is approximately 70 vehicles per hour. The current traffic volume data indicates that this route is currently operating well below capacity.

State Route 190 Traffic Volumes

The AADT volume along SR 190 ranges from approximately 230 vehicles both east of U.S. Highway 395 and west of SR 136 (year 2011 traffic volumes adjusted to reflect year 2012 conditions). The peak hour traffic volume at both of these locations is approximately 50 vehicles per hour. The current traffic volume data indicates that this route is currently operating well below capacity.

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[5] California Department of Transportation. August 2012. *2011 Traffic Volumes on California State Highway System*. Sacramento, CA.

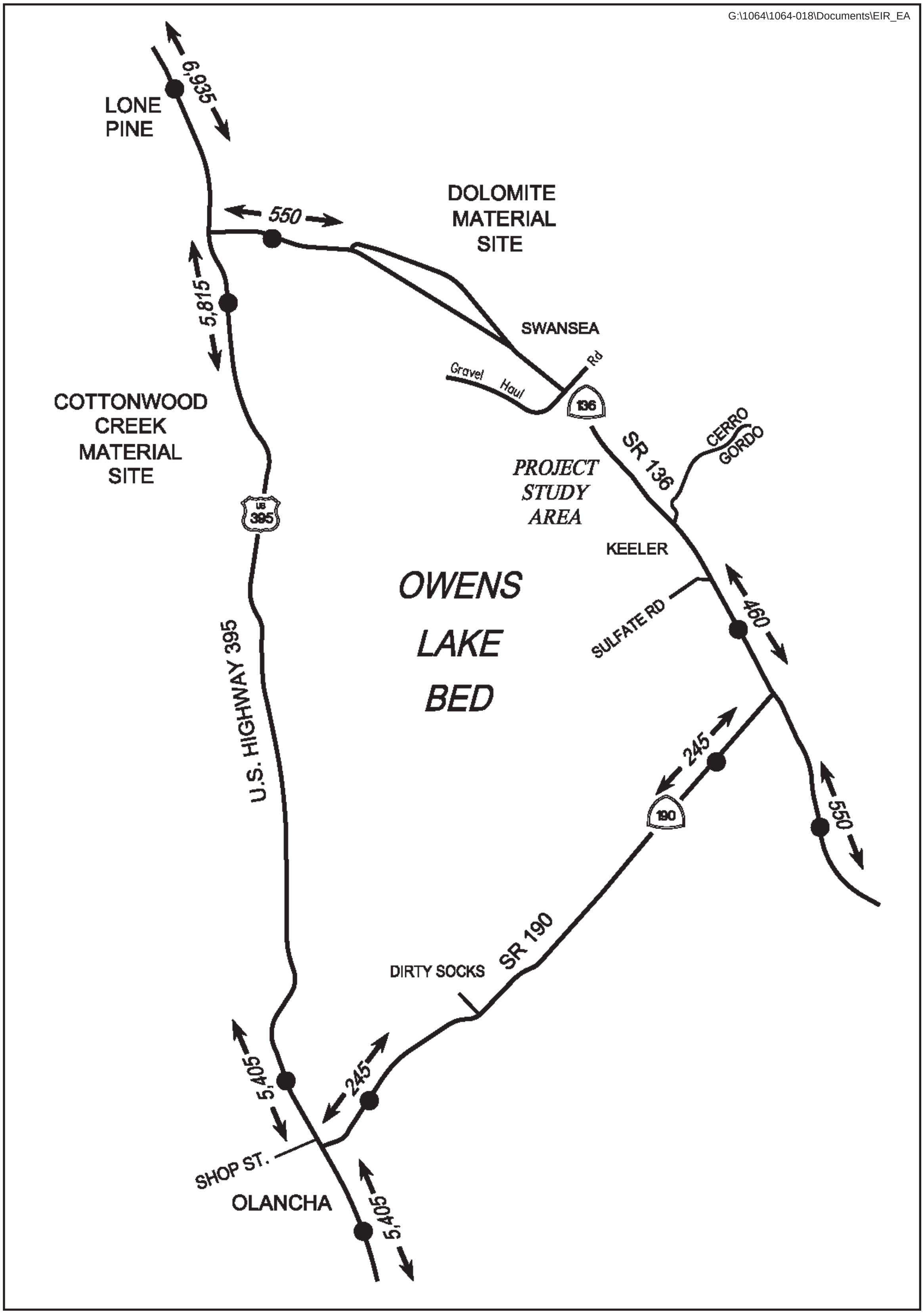

FIGURE 3.11.2.2-1
Existing 2011 Annual ADT Volumes

B. Roadway Design Configurations

The proposed project / proposed action study area is located adjacent to SR 136, which currently experiences compromised visibility during dust events. Visibility in the Owens Valley generally ranges from 37 to 93 miles, with the best visibility occurring during the winter. Visibility is most limited from October through June during high wind events that cause dust storms from the Keeler Dunes and uncontrolled sources on the Owens Lake bed. Owens Lake bed and Keeler Dunes dust storms can reduce visibility to zero. Dust storms from the Keeler Dunes mostly impact the local region near the communities of Keeler and Swansea, as well as traffic along SR 136. The main cause of visibility degradation in the Owens Valley is fine particulates in the atmosphere. In addition to dust from the Owens Lake bed and the Keeler Dunes, visibility degradation results and elevated PM_{10} levels are associated with forest fires that occur in the Sierra Nevada Mountains.[6]

C. Vehicular Emergency Access/Egress

The procedures for vehicular emergency access and egress for Inyo County are defined in the *Hazardous Materials Area Plan*.[7] The Inyo County Sheriff's Department has the primary responsibility for evacuation and identifying evacuation routes on incident by incident basis. The primary evacuation routes in the County consist of the major streets, state routes, and highways within the County, including US 395, SR 136, and SR 190, in the vicinity of the proposed project / proposed action study area. Additionally, for the proposed project / proposed action, the Old State Highway and Gravel Haul Road would be part of the routes used for emergency access and egress.

D. Existing Parking Conditions

The proposed project / proposed action study area does not include any permanent parking.

E. Existing Alternative Transportation Systems

There are no public transportation services (such as bus routes or dial-a-ride) or Class I, II, or III bike lanes serving the community of Keeler, or the proposed project / proposed action study area.[8][9,10]

F. Air Traffic

The Eastern Sierra Regional Airport (KBIH)[11] is located approximately 2 miles east of the city of Bishop, California, approximately 60 miles north of the proposed project / proposed action study area. The Lone Pine Airport, a publicly owned, privately operated airport is located approximately 12 miles northwest of the proposed project / proposed action study area.

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[6] Great Basin Unified Air Pollution Control District. 2 July 2008. *Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Final Environmental Impact Report*. State Clearinghouse Number 96122077. Bishop, CA.

[7] County of Inyo Department of Environmental Health Services. September 2008. *Hazardous Materials Area Plan*. Prepared by Risk Management Professionals [RMP], Inc.

[8] Inyo County Planning Department. December 2001. *Inyo County General Plan, Circulation*. Independence, CA.

[9] Inyo County Planning Department. December 2001. *Inyo County General Plan, Circulation*. Independence, CA.

[10] County of Inyo Local Transportation Commission. 2013. *Inyo County Collaborative Bikeways Plan, Appendix C.*

[11] Bishop Airport Homepage. Accessed 3 October 2012. Available at: http://www.inyocounty.us/Airport/index.html

CHAPTER 4.0 ENVIRONMENTAL CONSEQUENCES

4.1 AESTHETICS / VISUAL RESOURCES

This section examines potential impacts to visual resources associated with implementation of the proposed project / proposed action. Visual resources are objects (man-made and natural, moving and stationary) and features (such as landforms and water bodies) that are visible on a landscape. These resources contribute to the scenic or visual quality of the landscape. The analysis of visual impacts focuses primarily on long-term changes associated with operations and maintenance of the proposed project / proposed action.

4.1.1 STUDY METHODS

4.1.1.1 BLM VISUAL RESOURCE MANAGEMENT SYSTEM

The overall objective of the BLM's VRM system is to manage public lands in a manner that will protect the quality of the visual (scenic) values in accordance with Section 102(a)(8) of the FLPMA. The BLM VRM system is a methodical approach to inventorying and managing scenic resources on public lands.

As part of its resource planning efforts, the BLM conducts an inventory and analysis of scenic values of the public lands it administers in order to establish objectives for the management of activities that may affect visual resources located on those lands. Only activities that occur on BLM-administered property are subject to the management objectives related to designated VRM methodology and the VRCR system. The VRM and VRCR system involves inventorying scenic values and establishing management objectives for those values through the resource management planning process, and then evaluating proposed activities to determine whether those projects would conform to the management objectives.[1] This process helps to ensure that the actions taken on public lands today will benefit the landscape and adjacent communities in the future. Proposed changes to public lands are evaluated based on BLM's VRM manual[2] and VRCR manual.[3] The VRM system evaluates visual resources impacts to BLM lands by classifying scenic quality, viewer sensitivity, and distance into one of four categories (Class I, II, III, or IV), with Class I having the highest visual sensitivity and Class IV having the least sensitivity.[4]

VRM classifications are designated through BLM land use plans and resource management plans. The project area VRM classification is Class III.[5] A Visual Resources Inventory (VRI) summary was conducted to assess visual values of the proposed project / proposed action and alternatives and is available in Appendix B, *Visual Resources Technical Report*. VRI determination is based on an assessment of four factors: scenic quality, sensitivity, distance zones, and visual contrast ratings. KOPs were selected by BLM for use as locations from which to assess the proposed project / proposed action's impacts with regard to these four factors.

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[1] Bureau of Land Management. 1984. *Visual Resources Management*. Manual 8400. Washington, DC: U.S. Department of the Interior. Available at: http://www.blm.gov/nstc/VRM/8400.html

[2] Bureau of Land Management. 1984. *Visual Resources Management*. Manual 8400. Washington, DC: U.S. Department of the Interior. Available at: http://www.blm.gov/nstc/VRM/8400.html

[3] Bureau of Land Management. 1986. *Visual Resource Contrast Rating*. Manual 8431. Washington, DC: U.S. Department of the Interior. Available at: http://www.blm.gov/nstc/VRM/8431.html

[4] Bureau of Land Management. n.d. *VRM System*. Washington, DC: U.S. Department of the Interior. Available at: http://www.blm.gov/nstc/VRM/vrmsys.html

[5] Bureau of Land Management, Bakersfield District. April 1993. Bishop Resource Management Plan Record of Decision. Bakersfield, CA.

The proposed project / proposed action area for visual resources is defined by the on-site landscapes directly affected by the various components of the proposed project / proposed action and the surrounding off-site area from which the proposed project / proposed action may be visible. A viewshed is defined as a surface area visible from a particular location or a linear location (a road or trail). The proposed project / proposed action site is located within the dust control measures study area. Viewshed maps were prepared for the Visual Resources Technical Report and can be found in Appendix B.

4.1.2 CEQA SIGNIFICANCE CRITERIA / NEPA REQUIREMENTS

The affected environment for the resource areas identified as being potentially impacted by the proposed project / proposed action was described in Chapter 3 to provide the basis for the impact analysis in Sections 4.1. The CEQA Significance Determinations and NEPA Requirements are discussed concurrently where applicable (i.e., with regard to CEQA Guidelines criteria). For NEPA disclosure, the impact analysis is referring to the proposed project / proposed action or alternative. Direct effects (or impacts) are those occurring in the same place and time as the proposed project / proposed action with regard to construction and for operations and maintenance. Direct natural resource impacts from the proposed project / proposed action or an alternative are related to adverse changes in the visual landscape. Indirect effects (or impacts) are those that could result from the proposed project / proposed action or an alternative, but are later in time or further removed in distance (for example, located miles from the project site).

4.1.2.1 CEQA SIGNIFICANCE CRITERIA

The potential for the proposed project to result in impacts to aesthetics/visual resources was analyzed in relation to the questions contained in Appendix G of the State CEQA Guidelines. A significant impact on aesthetics/visual resources would normally be determined to occur if the project or project alternatives triggered one of the four thresholds established by Appendix G of the CEQA Guidelines:

(1) Results in a substantial adverse effect on a scenic vista[6]

(2) Substantially damages scenic resources, including, but not limited to, trees, rock outcrops, and historic buildings within a state scenic highway

(3) Substantially degrades the existing visual character or quality of the site and its surroundings

(4) Creates a new source of light or glare that would adversely affect day or nighttime views in the area

[6] Under CEQA, an impact to views is considered substantial if a view of a public scenic vista, scenic resource, or public object of aesthetic significance is substantially impeded or obstructed from a public vantage point. Typically, views enjoyed from a particular private vantage point are not protected. The Court of Appeal held in Topanga Beach Renters Assn. v. Department of General Services (1976) 58 Cal.App.3d 188, 195 states that "[t]he issue is not whether [the proposed project] will adversely affect particular persons, but whether [the proposed project] will adversely affect the environment of persons in general."

4.1.2.2 NEPA REQUIREMENTS

Significance under NEPA is defined in terms of both context and intensity. Context means that the significance of an action must be analyzed in several contexts, such as society, the affected region affected interests, and the local environment. Intensity refers to the severity of impact and includes a variety of factors to be considered (40 CFR 1508.27). Intensity factors potentially relevant to visual impacts as listed in 40 CFR 1508.27 (b) include "unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, . . . degree of controversy, degree of uncertainty about possible effects, degree to which an action may establish a precedent for future actions, and potential for cumulatively significant impacts."

4.1.3 ENVIRONMENTAL CONSEQUENCES

4.1.3.1 PROPOSED PROJECT / PROPOSED ACTION, DUST CONTROL MEASURES APPLIED TO 194 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / ATVS

The proposed project / proposed action would entail the establishment and management of native vegetation and the use of straw bales as temporary windbreaks positioned within an area of approximately 194 acres to stabilize the surface. Other proposed project / proposed action elements include temporary access routes; temporary staging areas for equipment and materials storage; and an effectiveness monitoring program (existing air monitoring stations). Further details of the proposed project / proposed action are described in Section 2.2.1, *Proposed Project / Proposed Action*.

A. Direct and Indirect Impacts

Construction

Construction of the proposed project / proposed action would cause temporary visual impacts due to the presence of equipment, materials, and workers. These short-term impacts would occur on the project site at various times over the course of the 11-month construction period. ATVs, semi-trucks with trailers, hay squeezes, water trucks, and pickup trucks would be needed to deliver materials to the project site. ATVs and trailers would be used within the project area and to move materials around the project site. Equipment would be visible from portions of SR 136 and adjacent roadways in the community of Keeler.

Throughout the construction period, the proposed project / proposed action implementation activities would result in short-term adverse impacts to the project site. Access routes and staging areas would be prepared by brushing and grubbing, which leaves the vegetation roots intact within the ground and avoids the greater visual impact of grading. Access routes and staging areas would eventually be restored with native vegetation following confirmation of successful completion of the proposed project / proposed action. The geometric shape of the straw bales would soften over time as natural elements degrade the organic materials. As seen in other dunes stabilization projects, the straw bales are likely to become partially covered by sand, further softening the shape to more natural lines.[7] Thus, impacts to visual resources associated with construction would be temporary. The visual character of

[7] HydroBio Advanced Remote Sensing. October 2011. "Stabilizing Keeler Dunes Rapidly Using Native Vegetation and Minimal Inputs." Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA.

the site would be altered from the existing sand sheet and bare sand dunes; however, the resulting visual character is similar to other natural dune environments such as the Swansea Dunes located to the north of the proposed project / proposed action. Following restoration of the access routes and staging areas, no direct impacts would occur. Indirect (subsequent, long-term) impacts of construction are discussed under Operations and Maintenance.

Operations and Maintenance

An analysis of operation and maintenance (long-term) impacts was conducted for the view areas represented by the KOPs selected for in-depth visual analysis. During watering events, 8,000-gallon water delivery trucks would be temporarily parked at Staging Areas 1, 2 and 3 for the proposed project and Alternatives 1 and 2. An analysis was undertaken to assess the visibility of the water delivery trucks from the KOPs. The results of the impact analysis are provided for each of the KOPs and additional information is available in the Visual Resources Technical Report (Please see Appendix B for additional information).

Key Observation Point 1. This KOP provides a view from the community of Keeler. This KOP illustrates little to no diversity in the landscape. Vegetation is low, sparse, simple, and indistinct under BLM definitions (Figure 3.1.2.3-2, *Observation Point 1*). Under direction of the BLM Bishop Field Office, no visual simulation was created for this KOP due to the low visibility of the proposed project / proposed action components (straw bales) in the view.[8] Water delivery trucks would make deliveries to Staging Areas 1, 2, and 3 on up to 50 days per year, in each of the 3 years following installation of the vegetation. The 8,000-gallon water delivery trucks would be temporarily parked at the staging areas only during water events and be consistent with other infrastructure that is visible from KOP 1, including the Old State Highway and the 10- to 15-foot high structures and mobile homes located in the adjacent community of Keeler. Water delivery trucks temporarily parked at Staging Areas 2 and 3 would be barely visible from KOP 1, and would occupy less than one percent of the view. The low visibility of the landscape means that the visual character of the landscape from this KOP should be retained, thereby meeting VRM Class III standards.

Key Observation Point 2. This KOP provides a view from the paved SR 136. The proposed project / proposed action would be visible from this vantage point in the foreground as it is less than 1 mile from the vantage point (Figure 3.1.2.3-3, *Observation Point 2*). The existing vegetation is tan in color. With project implementation, the view from this point would have tan-colored straw bales covering a portion of the previously beige valley edge. From this view, as the straw bales and the vegetation are both tan in color and would appear at similar heights, the straw bales would have the same height and color as the existing, native vegetation. In fact, the straw bales would appear inter-mixed, blend in, and be compatible in the view with the existing vegetation. The other infrastructure project elements (a temporary access route, staging areas for equipment, and temporarily parked water delivery trucks at Staging Areas 1, 2, and 3) would be barely visible from this vantage point and would appear intermixed within the existing visual setting. The proposed project / proposed action components would be visible but mixed with the already existing vegetation in the foreground. The straw bales would blend in with the existing visual character of the landscape from this KOP, thereby meeting VRM Class III standards to retain the existing landscape character. Water delivery trucks would make deliveries to Staging Areas 1, 2, and 3 on up to 50 days per year, in each of the 3 years following installation of the vegetation. The 8,000-gallon water delivery trucks would be temporarily parked at

[8] Primosch, Lawrence R., Bureau of Land Management, Bishop Field Office, Bishop, CA. 24 April 2012. Proposed Project Site Visit with Grace Holder, Great Basin Unified Air Pollution District, Bishop, CA, and David Lee and Leanna Guillermo, Sapphos Environmental, Inc., Pasadena, CA.

the staging areas only during water events and be consistent with other infrastructure that is visible from KOP 2, including the paved SR 136, electrical transmission lines located approximately 620 feet northeast of KOP 2; the Keeler Community Services District (KCSD) well, located approximately 300 feet southeast of KOP 2; and the KCSD water storage tank, located approximately 0.7 mile southeast of KOP 2. Water delivery trucks temporarily parked at Staging Area 3 would be barely visible from KOP 2 and would occupy less than one percent of the view. The low visibility of the landscape means that the visual character of the landscape from this KOP should be retained, thereby meeting VRM Class III standards.

Key Observation Point 3. This KOP was taken at the LADWP scenic overlook on SR 136. The visual simulation depicts the addition of the proposed project / proposed action features, with straw bales visible in horizontal lines within 1 mile of the vantage point (Figure 3.1.2.3-4, *Observation Point 3*). Therefore, the proposed project / proposed action components would be visible in the foreground. The existing vegetation is tan and green in color, with the tan similar to the tan in the straw bales. The vegetation is coarsely scattered throughout the proposed project / proposed action site and surrounding area. The straw bales that would be visible from this viewpoint are tan and coarse, similar to the color and characteristics of the existing vegetation. From this view, the straw bales would have the same height and blend in and be compatible with the color of the existing, native vegetation. The other infrastructure proposed project / proposed action elements (a temporary access route, staging areas for equipment, and temporarily parked water delivery trucks at Staging Areas 1, 2, and 3) would be barely visible from this KOP and would appear intermixed within the existing visual setting. Water delivery trucks would make deliveries to Staging Areas 1, 2, and 3 on up to 50 days per year, in each of the 3 years following installation of the vegetation. The 8,000-gallon water delivery trucks would be temporarily parked at the staging areas only during water events and be consistent with other infrastructure that is visible from KOP 3, including the vertical electrical transmission line poles located less than 150 feet northwest and approximately 246 feet southeast of KOP 3; SR 136; and the KCSD water storage tank, located approximately 1.5 miles southeast of KOP 3. Water delivery trucks temporarily parked at Staging Areas 2 and 3 would be barely visible from KOP 3 and would occupy less than one percent of the view. The proposed project / proposed action components would be visible but mix with the existing vegetation in the foreground. A low level of change to the landscape would be made through implementation of the project from this KOP, thereby meeting VRM Class III standards.

Key Observation Point 4. This KOP illustrates the vast, relatively flat, valley bottom in the foreground, the Owens Lake bed in the middle ground, and the mountain ridgeline in the background (Figure 3.1.2.3-5-4, *Observation Point 4*). The proposed project / proposed action would be visible from this vantage point in the foreground as it is less than 1 mile from the vantage point. The straw bales from the proposed project / proposed action would be visible in the center-right side of the photograph. The straw bales are a tan color and would appear coarse in this vantage point. The existing vegetation is tan and green in color, with the tan similar to the tan in the straw bales. The vegetation is coarsely scattered throughout the proposed project / proposed action site and surrounding area. From this view, the straw bales would have the same height as, blend in with, and be compatible with the color of the existing native vegetation. The other infrastructure proposed project / proposed action elements (a temporary access route, staging areas for equipment, and temporarily parked water delivery trucks at Staging Areas 1, 2, and 3) would be barely visible from this view point and would appear intermixed within the existing visual setting. Water delivery trucks would make deliveries to Staging Areas 1, 2, and 3 on up to 50 days per year, in each of the 3 years following installation of the vegetation. The 8,000-gallon water delivery trucks would be temporarily parked at the staging areas only during water events and be consistent with other infrastructure that is visible from KOP 4, including vertical electrical transmission lines in the foreground, less than 700 feet southwest of KOP 4. Water delivery trucks temporarily parked at Staging Area 1 would be barely visible from KOP 4 and would occupy less than one percent of the view. The view from KOP 4 would meet VRM Class III standards because the straw bales would be compatible with the existing visual character of the landscape.

B. CEQA Significance Determinations

Would the proposed project:

(1) Have a substantial adverse effect on a scenic vista?

Construction

The proposed project would not result in substantial impacts to aesthetics related to scenic vistas during construction. There are no scenic vistas near the proposed project; nor is the proposed project visible from any designated scenic vista. Therefore, the proposed project would not result in substantial impacts to aesthetics related to scenic vistas. The proposed project components (straw bales, vegetation, a temporary access route, staging areas for equipment, and temporarily parked water delivery trucks at Staging Areas 1, 2, and 3) would intermix compatibly with the existing landscape. The staging areas would remain for 3 years following the installation of vegetation. The proposed project would not obstruct any prominent scenic vista or views open to the public or result in the creation of an aesthetically offensive site from a designated scenic public view.

The proposed project site and the surrounding area, as observed by its existing conditions, do not meet the criteria of a scenic vista.

Operations and Maintenance

The discussion regarding the location of the project site in a scenic vista described under Construction also applies to Operation and Maintenance. The proposed project would not have a substantial adverse effect on a scenic vista during operations and maintenance. No operations and maintenance related impact to a scenic vista would occur under CEQA.

(2) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

Construction

The proposed project would be expected to result in less than substantial impacts to aesthetics in relation to substantial damage to scenic resources within a state scenic highway during construction. As indicated above, the nearest highways to the proposed project site are California SR 136 and SR 190. SR 136 is not an officially designated state scenic highway. A portion of SR 190 is designated as an Officially Designated Route, but that portion is located approximately 16.7 miles away from the proposed project site, near the entrance to Death Valley National Park on the opposite side of the Inyo Mountain range. At this distance and topographical separation, the proposed project site would not be visible from the officially designated portion of SR 190. The proposed project would not be located within the viewshed of an Officially Designated Scenic Highway.[9] No designated scenic highways are present in

[9] California Department of Transportation. 13 September 2012. *Eligible (E) and Officially Designated (OD) Routes*. Available at: http://www.dot.ca.gov/hq/LandArch/scenic/cahisys.htm

the immediate vicinity of the proposed project site, and no scenic highway viewsheds would be affected by the proposed project. Therefore, the proposed project would not be expected to result in substantial impacts to aesthetics related to substantial damage to scenic resources within a state scenic highway.

Operations and Maintenance

The discussion regarding the location of the project site near a scenic highway and resources described under Construction also applies to Operation and Maintenance. The proposed project would not have a substantial adverse effect on natural resources near a scenic highway during operations and maintenance. No operations and maintenance related impact to resources within a state scenic highway would occur under CEQA.

(3) Substantially degrade the existing visual character or quality of the site and its surroundings?

Construction

The proposed project would not be expected to result in substantial impacts to aesthetics related to substantial degradation of the existing visual character of the site and its surroundings during construction. The proposed project components include placement of straw bales to facilitate establishment of native vegetation, installation of native vegetation that is characteristic of stable dune structures in the Owens Lake area, a temporary access route, temporary staging areas for equipment, and temporary water delivery trucks parked at the staging areas along the Old State Highway. As depicted in visual simulations, the straw bales and vegetation would be tan in color and short in height (Appendix B). The existing vegetation is also tan and short. The straw bales and vegetation would be similar in color and height to the existing native vegetation, and they would appear intermixed and compatible with the existing vegetation from a distance. The straw bales would be placed in a random pattern to mimic vegetation patterns on the project site. From areas adjacent to the project site, the straw bales' geometric shape would contrast with the natural landscape, but over time the shape would soften as this organic material is degraded and covered by blowing sand.

Temporary infrastructure elements (an access route, staging areas for equipment, and water delivery trucks) of the proposed project would also appear intermixed with the existing visual setting. The proposed project components would be visible but compatible with the existing landscape of the proposed project site, which contains nearby water storage wells and tanks, vertical electrical transmission lines passing through the site, vehicles including watering trucks and double rigs traveling along SR 136 and in the Owens Lake dust control area, and 10- to 15- foot high structures and mobile homes in the nearby community of Keeler; therefore, the visual character of the site and surrounding area would appear minimally changed to viewers of the proposed project during construction. There would be a maximum of one water delivery truck at a time at each onsite staging area during watering events. Short-term impacts to views from SR 136 and for recreational users would occur during construction when workers, equipment, and materials would be on the site. However, these temporary impacts to visual character would occur only during the 11-month implementation phase, and the proposed project would not be expected to result in substantial impacts to aesthetics related to substantial degradation of the existing visual character of the site and its surroundings during construction.

Operations and Maintenance

The visual character of the proposed project site would be altered from the existing sand sheet and bare sand dunes; however, the resulting visual character is similar to other natural dune environments such as the Swansea Dunes located to the north of the proposed project, and is compatible with the surrounding area's visual character (Figure 2.1.5.2-1, *Example of Vegetated Swansea Dunes*). The straw bales and vegetation would be similar in color and height to the existing native vegetation, and they would appear intermixed and compatible with the existing vegetation from a distance. The geometric shape of the straw bales would soften over time and as seen in previous studies for dune stabilization, the straw bales would become partially buried by moving sand and appear more as a natural element of the landscape.[10] Eventually, as the dunes become stabilized by native vegetation, the straw bales would be expected to degrade and provide organic matter to the soil. There would be a maximum of one water delivery truck at a time at each onsite staging area during watering events. The temporary use of small water tanks mounted to ATVs during watering events would occur approximately 680–690 feet (0.1 mile) away from SR 136 and would be visible from KOP 1 and barely visible from KOP 2, 3, and 4 during watering events. The temporary parking of water delivery trucks at three staging areas during watering events would be visible in less than one percent of the viewshed from surrounding public viewpoints within up to 4 miles of project area from the east and would be consistent with other public infrastructure visible from the KOPs, including vehicles traveling along SR 136, vertical electrical transmission lines, sand monitoring equipment, and infrastructure associated with dust control measures on the Owens Lake bed. Therefore, operations and maintenance of the proposed project would not substantially degrade the visual quality of the project site or surround area based on the analysis of the viewsheds from the KOPs (see *Direct and Indirect Impacts*, above, and also Appendix B).

(4) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Construction

The proposed project would be expected to result in less than substantial impacts to aesthetics related to the creation of a new source of substantial light or glare during construction. There are currently no substantial sources of glare at the proposed project site (e.g., mirrored buildings, building materials, etc.). The proposed project components would entail planting and establishment of native vegetation, installation of straw bales as a temporary windbreak, and a temporary water delivery system. The proposed project does not include any building construction. There are no buildings existing on the proposed project site. All of the proposed project components would be non-reflective, would not emanate light, and would not be a source of glare during the daytime when sunlight is present. The proposed project would not be expected to create new sources of light and glare. None of the proposed project components, including vegetation and infrastructure elements, would be anticipated to emit light or glare. Project and equipment used during construction of the project would not create a substantial impact from light and glare. Construction activities would only occur during day light hours. Therefore, the proposed project would not be expected to result in substantial impacts to aesthetics related to the creation of a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

[10] HydroBio Advanced Remote Sensing. October 2011. "Stabilizing Keeler Dunes Rapidly Using Native Vegetation and Minimal Inputs." Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA.

Operations and Maintenance

The proposed project site is an undeveloped open space and is currently not a source of light and glare. There are no facilities or lighting system proposed for the project site. Therefore, there would be no substantial impacts due to light and glare under CEQA.

4.1.3.2 ALTERNATIVE 1, DUST CONTROL MEASURES APPLIED TO 214 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / ATVS

Under Alternative 1, the dust control measures would be essentially the same as for the proposed project / proposed action (as described in Section 2.2.2). The primary difference between the alternatives would be the total number of plants and straw bales that would be transported to the proposed project site and distributed onto a larger area (20 additional acres) of dust control. Alternative 1 would result in a greater number of plants and straw bales; hence, additional workers and equipment may be necessary to complete the alternative in the same time frame as the proposed project / proposed action. As with the proposed project / proposed action, supplemental irrigation in the first 3 years following installation of native vegetation would be completed via hauling of water in small water tanks (about 150–200 gallons) mounted on a trailer and pulled with an ATV and then irrigation would be conducted by hand through a small diameter hose. Further details of Alternative 1 are described in Section 2.2.2.

A. Direct and Indirect Impacts

Under Alternative 1, dust control measures including planting native vegetation and placing of straw bales as temporary windbreaks would be applied to a total of 214 acres of the emissive deposits in the dunes. The construction scenario, access routes, staging areas and other design features would be the same as for the proposed project / proposed action, although the area of impact would be 20 acres larger. The potential direct and indirect impacts to aesthetics and visual resources from Alternative 1 are the same as the potential direct and indirect impacts of the proposed project / proposed action (see Section 4.1.3.1). The property would continue to meet VRM Class III objectives under Alternative 1.

B. CEQA Significance Determinations

Would Alternative 1:

(1) Cause a substantial adverse effect on a scenic vista, as defined in CEQA Guidelines § 21084.C?

Construction

Alternative 1 would not result in substantial impacts to aesthetics related to scenic vistas during construction. There are no scenic vistas near the Alternative 1 site; nor is the Alternative 1 site visible from any designated scenic vista. Therefore, Alternative 1 would not result in substantial impacts to aesthetics related to scenic vistas. As with the proposed project, Alternative 1 components (straw bales, vegetation, a temporary access route, staging areas for equipment, and water delivery trucks) would intermix compatibly with the existing landscape. The staging areas would remain for 3 years following the installation of vegetation. Alternative 1 would not obstruct any prominent scenic vista or views open to the public or result in the creation of an aesthetically offensive site from a designated scenic public view.

The Alternative 1 site and the surrounding area, as observed by its existing conditions, do not meet the criteria of a scenic vista.

Operations and Maintenance

The discussion regarding the location of the Alternative 1 site in a scenic vista described under Construction also applies to Operation and Maintenance. Alternative 1 would not have a substantial adverse effect on a scenic vista during operations and maintenance. No operations and maintenance related impact to a scenic vista would occur under CEQA.

(2) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway, as defined in CEQA Guidelines § 21084.C?

Construction

Alternative 1 would be expected to result in less than substantial impacts to aesthetics in relation to substantial damage to scenic resources within a state scenic highway during construction. As indicated above, the nearest highways to the Alternative 1 site are California SR 136 and SR 190. SR 136 is not an officially designated state scenic highway. A portion of SR 190 is designated as an Officially Designated State Scenic Highway Route, but that portion is located approximately 16.7 miles from the Alternative 1 site, near the entrance to Death Valley National Park on the opposite side of the Inyo Mountain range. At this distance and topographical separation, the Alternative 1 site would not be visible from the officially designated portion of SR 190. Alternative 1 would not be located within the viewshed of an Officially Designated Scenic Highway.[11] No designated scenic highways are present in the immediate vicinity of the Alternative 1 site, and no scenic highway viewsheds would be affected by Alternative 1. Therefore, Alternative 1 would not be expected to result in substantial impacts to aesthetics related to substantial damage to scenic resources within a state scenic highway.

Operations and Maintenance

The discussion regarding the location of the Alternative 1 site near a scenic highway and resources described under Construction also applies to Operation and Maintenance. Alternative 1 would not have a substantial adverse effect on natural resources near a scenic highway during operations and maintenance. No operations and maintenance related impact to resources within a state scenic highway would occur under CEQA.

(3) Substantially degrade the existing visual character or quality of the site and its surroundings?

Construction

Alternative 1 would not be expected to result in substantial impacts to aesthetics related to substantial degradation of the existing visual character of the site and its surroundings during construction. The Alternative 1 project components include temporary placement of straw bales to facilitate establishment of native vegetation, installation of native vegetation that is characteristic of stable dune structures in the Owens Lake area, a temporary access route, temporary staging areas for equipment, and temporary water delivery trucks. As depicted in visual simulations, the straw bales and vegetation

[11] California Department of Transportation. 13 September 2012. *Eligible (E) and Officially Designated (OD) Routes*. Available at: http://www.dot.ca.gov/hq/LandArch/scenic/cahisys.htm

would be tan in color and short in height (Appendix B). The existing vegetation is also tan and short. The straw bales and vegetation would be similar in color and height to the existing native vegetation, and they would appear intermixed and compatible with the existing vegetation from a distance. The straw bales would be placed in a random pattern to mimic vegetation patterns on the Alternative 1 site. From areas adjacent to the Alternative 1 site, the straw bales' geometric shape would contrast with the natural landscape, but over time the shape would soften as this organic material is degraded and covered by blowing sand.

Temporary infrastructure elements (an access route, staging areas for equipment, and water delivery trucks) of Alternative 1 would also appear intermixed with the existing visual setting. The Alternative 1 project components would be visible but compatible with the existing landscape of the Alternative 1 site; therefore, the visual character of the site and surrounding area would appear minimally changed to viewers of Alternative 1 during construction. Short-term impacts to views from SR 136 and for recreational users would occur during construction when workers, equipment, and materials would be on the site. However, these temporary impacts to visual character would occur only during the 11-month implementation phase, and Alternative 1 would not be expected to result in substantial impacts to aesthetics related to substantial degradation of the existing visual character of the site and its surroundings during construction.

Operations and Maintenance

The visual character of the Alternative 1 site would be altered from the existing sand sheet and bare sand dunes to include native vegetation; however, the resulting visual character is similar to other natural dune environments such as the Swansea Dunes located to the north of the Alternative 1 site, and is compatible with the surrounding area's visual character (Figure 2.1.5.2-1). The straw bales and vegetation would be similar in color and height to the existing native vegetation, and they would appear intermixed and compatible with the existing vegetation from a distance. The geometric shape of the straw bales would soften over time and as seen in previous studies for dune stabilization, the straw bales would become partially buried by moving sand and appear more as a natural element of the landscape.[12] Eventually, as the dunes become stabilized by native vegetation, the straw bales would be expected to degrade and provide organic matter to the soil. There would be a maximum of one water delivery truck at a time at each onsite staging area during watering events. The temporary use of small water tanks mounted to ATVs during watering events would occur approximately 680–690 feet (0.1 mile) away from SR 136 and would be visible from KOP 1 and barely visible from KOP 2, 3, and 4 during watering events. The temporary parking of water delivery trucks at three staging areas during watering events would be visible in less than one percent of the viewshed from surrounding public viewpoints within up to 4 miles of project area from the east and would be consistent with other public infrastructure visible from the KOPs, including SR 136, vertical electrical transmission lines, sand monitoring equipment and infrastructure associated with dust control measures on the Owens Lake bed. Therefore, operations and maintenance of Alternative 1 would not substantially degrade the visual quality of the Alternative 1 site or surround area based on the analysis of the viewsheds from the KOPs (see *Direct and Indirect Impacts*, above, and also Appendix B).

(4) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

[12] HydroBio Advanced Remote Sensing. October 2011. "Stabilizing Keeler Dunes Rapidly Using Native Vegetation and Minimal Inputs." Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA.

Construction

Alternative 1 would be expected to result in less than substantial impacts to aesthetics related to the creation of a new source of substantial light or glare during construction. There are currently no substantial sources of glare at the Alternative 1 site (e.g., mirrored buildings, building materials, etc.). The Alternative 1 project components would entail planting and establishment of native vegetation, installation of straw bales as a temporary windbreak, and a temporary water delivery system. Alternative 1 does not include any building construction. There are no buildings existing on the Alternative 1 site. All of the Alternative 1 project components would be non-reflective, would not emanate light, and would not be a source of glare during the daytime when sunlight is present. Alternative 1 would not be expected to create new sources of light and glare. None of the Alternative 1 project components, including vegetation and infrastructure elements, would be anticipated to emit light or glare. Project and equipment used during construction of Alternative 1 would not create a substantial impact from light and glare. Construction activities would only occur during day light hours. Therefore, Alternative 1 would not be expected to result in substantial impacts to aesthetics related to the creation of a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

Operations and Maintenance

The Alternative 1 site is an undeveloped open space and is currently not a source of light and glare. There are no facilities or lighting system proposed for the Alternative 1 site. Therefore, there would be no substantial impacts due to light and glare under CEQA.

4.1.3.3 ALTERNATIVE 2, DUST CONTROL MEASURES APPLIED TO 197 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / ATVS

Under Alternative 2, dust control measures including planting native vegetation and placing of straw bales as temporary windbreaks would be applied to an additional 3 acres, a total of 197 acres, of the emissive deposits in the dunes. Implementation and installation of the dust control measures would remain the same as the proposed project / proposed action. Further details of Alternative 2 are described in Section 2.2.3.

A. Direct and Indirect Impacts

Under Alternative 2, dust control measures including planting native vegetation and placing of straw bales as temporary windbreaks would be applied to a total of 197 acres of the emissive deposits in the dunes. The construction scenario, access routes, water delivery trucks, staging areas and other design features would be the same as for the proposed project / proposed action. The potential direct and indirect impacts to aesthetics and visual resources from Alternative 2 are the same as the potential direct and indirect impacts of the proposed project / proposed action (see Section 4.1.3.1). The property would continue to meet VRM Class III objectives under Alternative 2.

B. CEQA Significance Determinations

Would Alternative 2:

(1) Cause a substantial adverse effect on a scenic vista, as defined in CEQA Guidelines § 21084.C?

Construction

Alternative 2 would not result in substantial impacts to aesthetics related to scenic vistas during construction. There are no scenic vistas near the Alternative 2 site; nor is Alternative 2 visible from any designated scenic vista. Alternative 2 would not result in substantial impacts to aesthetics related to scenic vistas. As with the proposed project, Alternative 2 components (straw bales, vegetation, a temporary access route, staging areas for equipment, and water delivery trucks) would intermix compatibly with the existing landscape. The staging areas would remain for 3 years following the installation of vegetation. Alternative 2 would not obstruct any prominent scenic vista or views open to the public or result in the creation of an aesthetically offensive site from a designated scenic public view.

The Alternative 2 site and the surrounding area, as observed by its existing conditions, do not meet the criteria of a scenic vista.

Operations and Maintenance

The discussion regarding the location of the Alternative 2 site in a scenic vista described under Construction also applies to Operation and Maintenance. Alternative 2 would not have a substantial adverse effect on a scenic vista during operations and maintenance. No operations and maintenance related impact to a scenic vista would occur under CEQA.

(2) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway, as defined in CEQA Guidelines § 21084.C?

Construction

Alternative 2 would be expected to result in less than substantial impacts to aesthetics in relation to substantial damage to scenic resources within a state scenic highway during construction. As indicated above, the nearest highways to the Alternative 2 site are California SR 136 and SR 190. SR 136 is not an officially designated state scenic highway. A portion of SR 190 is designated as an Officially Designated State Scenic Highway Route, but that portion is located approximately 16.7 miles from the Alternative 1 site, near the entrance to Death Valley National Park on the opposite side of the Inyo Mountain range. At this distance and topographical separation, the Alternative 2 site would not be visible from the officially designated portion of SR 190. The Alternative 2 would not be located within the viewshed of an Officially Designated Scenic Highway.[13] No designated scenic highways are present in the immediate vicinity of the Alternative 2 site, and no scenic highway viewsheds would be affected by Alternative 2. Therefore, Alternative 2 would not be expected to result in substantial impacts to aesthetics related to substantial damage to scenic resources within a state scenic highway.

[13] California Department of Transportation. 13 September 2012. *Eligible (E) and Officially Designated (OD) Routes*. Available at: http://www.dot.ca.gov/hq/LandArch/scenic/cahisys.htm

Operations and Maintenance

The discussion regarding the location of the Alternative 2 site near a scenic highway and resources described under Construction also applies to Operation and Maintenance. Alternative 2 would not have a substantial adverse effect on natural resources near a scenic highway during operations and maintenance. No operations and maintenance related impact to resources within a state scenic highway would occur under CEQA.

(3) Substantially degrade the existing visual character or quality of the site and its surroundings?

Construction

Alternative 2 would not be expected to result in substantial impacts to aesthetics related to substantial degradation of the existing visual character of the site and its surroundings during construction. The Alternative 2 project components include temporary placement of straw bales to facilitate establishment of native vegetation, installation of native vegetation that is characteristic of stable dune structures in the Owens Lake area, a temporary access route, staging areas for equipment, and the use of water delivery trucks at the staging areas for 3 years following installation of the vegetation. As depicted in visual simulations, the straw bales and vegetation would be tan in color and short in height (Appendix B). The existing vegetation is also tan and short. The straw bales and vegetation would be similar in color and height to the existing native vegetation, and they would appear intermixed and compatible with the existing vegetation from a distance. The straw bales would be placed in a random pattern to mimic vegetation patterns on the project site. From areas adjacent to the Alternative 2 site, the straw bales' geometric shape would contrast with the natural landscape, but over time the shape would soften as this organic material is degraded and covered by blowing sand.

As with the proposed project, Alternative 2 components would be visible but compatible with the existing landscape of the site; therefore, the visual character of the site and surrounding area would appear minimally changed to viewers of Alternative 2 during construction. Short-term impacts to views from SR 136 and for recreational users would occur during construction when workers, equipment, and materials would be on the site. However, these temporary impacts to visual character would occur only during the 11-month implementation phase, and Alternative 2 would not be expected to result in substantial impacts to aesthetics related to substantial degradation of the existing visual character of the site and its surroundings during construction.

Operations and Maintenance

The visual character of the Alternative 2 site would be altered from the existing sand sheet and bare sand dunes; however, the resulting visual character is similar to other natural dune environments such as the Swansea Dunes located to the north of the Alternative 2 site, and is compatible with the surrounding area's visual character (Figure 2.1.5.2-1). The straw bales and vegetation would be similar in color and height to the existing native vegetation, and they would appear intermixed and compatible with the existing vegetation from a distance. The geometric shape of the straw bales would soften over time and as seen in previous studies for dune stabilization, the straw bales would become partially buried by moving sand and appear more as a natural element of the landscape.[14] Eventually, as the dunes become stabilized by native vegetation, the straw bales would be expected to degrade and provide organic matter to the soil. There would be a maximum of one water delivery truck at a

[14] HydroBio Advanced Remote Sensing. October 2011. "Stabilizing Keeler Dunes Rapidly Using Native Vegetation and Minimal Inputs." Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA.

time at each onsite staging area during watering events. The temporary use of small water tanks mounted to ATVs during watering events would occur approximately 680–690 feet (0.1 mile) away from SR 136 and would be visible from KOP 1 and barely visible from KOP 2, 3, and 4 during watering events. The temporary parking of water delivery trucks at three staging areas during watering events would be visible in less than one percent of the viewshed from surrounding public viewpoints within up to 4 miles of proposed project area from the east and would be consistent with other public infrastructure visible from the KOPs, including SR 136, vertical electrical transmission lines, sand monitoring equipment and infrastructure associated with dust control measures on the Owens Lake bed. Therefore, operations and maintenance of Alternative 2 would not substantially degrade the visual quality of the Alternative 2 site or surround area based on the analysis of the viewsheds from the KOPs (see *Direct and Indirect Impacts*, above, and also Appendix B).

(4) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Construction

Alternative 2 would be expected to result in less than substantial impacts to aesthetics related to the creation of a new source of substantial light or glare during construction. There are currently no substantial sources of glare at the Alternative 2 site (e.g., mirrored buildings, building materials, etc.). The Alternative 2 project components would entail planting and establishment of native vegetation, installation of straw bales as a temporary windbreak, and a temporary water delivery system. Alternative 2 does not include any building construction. There are no buildings existing on the Alternative 2 site. All of the Alternative 2 project components would be non-reflective, would not emanate light, and would not be a source of glare during the daytime when sunlight is present. Alternative 2 would not be expected to create new sources of light and glare. None of the Alternative 2 project components, including vegetation and infrastructure elements, would be anticipated to emit light or glare. Alternative 2 and equipment used during construction of Alternative 2 would not create a substantial impact from light and glare. Construction activities would only occur during day light hours. Therefore, Alternative 2 would not be expected to result in substantial impacts to aesthetics related to the creation of a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

Operations and Maintenance

The Alternative 2 site is an undeveloped open space and is currently not a source of light and glare. There are no facilities or lighting system proposed for the Alternative 2 site. Therefore, there would be no substantial impacts due to light and glare under CEQA.

4.1.3.4 ALTERNATIVE 3, DUST CONTROL MEASURES APPLIED TO 194 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / TANKS / PVC IRRIGATION SYSTEM AND SELECTED MANUAL WATERING

Under Alternative 3, the dust control measures would be the same as the proposed project / proposed action (as described in Section 2.2.4). Water obtained from the District's production well at the Fault Test site would be transported to the site via large water trucks to temporary 20-foot high, 14-foot diameter aboveground 20,000-gallon storage tanks located at the three of the four designated staging areas. Since the staging areas are lower in elevation than the Alternative 3 area, each staging area would need to have a manifold and booster pump to pressurize the irrigation system. The use of small water tanks mounted on ATVs, to distribute supplemental irrigation during the operations and maintenance phase of the Alternative 3, would be replaced with a temporary aboveground irrigation system that would be installed within the 95 percent control level area to provide water to the Alternative 3 area (Table 4.1.3.4-1, *Alternative 3 Irrigation Pipeline Area)*. Plants within the sensitive 85 percent control area would be manually watered using the same method as described proposed project / proposed action. In the environmentally sensitive areas, the small ATV mounted tanks would be filled with water from the delivery system within the Alternative 3 area instead of from trucks at the staging areas. None of the temporary irrigation infrastructure would be buried below ground and the irrigation system would be removed after the 3-year irrigation period. Further details of Alternative 3 are described in Section 2.2.4.

TABLE 4.1.3.4-1
ALTERNATIVE 3 IRRIGATION PIPELINE AREA

Unit	6-inch PVC Pipe - Trunk Line	4-6-inch PVC Pipe – Transmission Line	2-inch PVC Pipe – Distribution Line	Total Length of PVC Pipe
Feet of White PVC Pipeline	3,362 feet	9,577 feet	51,364 feet	64,303 feet
Miles of White PVC Pipeline	0.6 mile	1.8 miles	9.7 miles	12.2 miles

A. Direct and Indirect Impacts

Under Alternative 3, dust control measures including planting native vegetation and placing of straw bales as temporary windbreaks would be applied to a total of 194 acres of the emissive deposits in the dunes. The access routes, staging areas and other design features would be the same as for the proposed project / proposed action, except construction would involve the additional installation of large water storage tanks at Staging Areas 1, 2, and 3 and an aboveground irrigation system and operations and maintenance would involve the use of the temporary irrigation system across 177 acres of the 194 acres of dust control measures. The potential direct and indirect impacts to aesthetics and visual resources from Alternative 3 are similar to the potential direct and indirect impacts of the proposed project / proposed action, with potential visibility of the water storage tanks and white PVC irrigation pipes (see Section 4.1.3.1). The property would continue to meet VRM Class III objectives under Alternative 3 because this alternative would result in a low to moderate change in the characteristic landscape that would not dominate the view of the casual observer. The grid lines of the aboveground irrigation lines would be predominantly shielded from view by the straw bales and dune topography, with the small visible portions of white pipe blending into the distance. Booster pumps at the staging areas would be small enough to not be visible by the casual observer. The water storage tanks would be painted dark olive green to blend into the landscape, and the white PVC irrigation pipes would have low visibility from the casual observer due to the presence of the straw bales visually breaking up the line of the pipes. The distant view of the temporary water storage tanks would be consistent with the visibility of other water storage tanks and wells along the edge of other Owens Valley dust control measure projects.

B. CEQA Significance Determinations

Would Alternative 3:

(1) Cause a substantial adverse effect on a scenic vista, as defined in CEQA Guidelines § 21084.C?

Construction

Alternative 3 would not result in substantial impacts to aesthetics related to scenic vistas during construction. There are no scenic vistas near the Alternative 3 site; nor is Alternative 3 visible from any designated scenic vista. Therefore, Alternative 3 would not result in substantial impacts to aesthetics related to scenic vistas. As with the proposed project, Alternative 3 project components (straw bales, vegetation, a temporary access route, staging areas for equipment, water storage tanks, temporary aboveground irrigation system, and water delivery trucks at Staging Areas 1, 2, and 3) would intermix compatibly with the existing landscape and the temporary aboveground irrigation system would be predominantly shielded from view by the straw bales, existing vegetation, and shallow dune slopes. Temporary infrastructure to support supplemental irrigation would be in place for 3 years following installation of the vegetation. Alternative 3 would not obstruct any prominent scenic vista or views open to the public or result in the creation of an aesthetically offensive site from a designated scenic public view.

The Alternative 3 site and the surrounding area, as observed by its existing conditions, do not meet the criteria of a scenic vista.

Operations and Maintenance

The discussion regarding the location of the Alternative 3 site in a scenic vista described under Construction also applies to Operation and Maintenance. Alternative 3 would not have a substantial adverse effect on a scenic vista during operations and maintenance. No operations and maintenance related impact to a scenic vista would occur under CEQA.

(2) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway, as defined in CEQA Guidelines § 21084.C?

Construction

Alternative 3 would be expected to result in less than substantial impacts to aesthetics in relation to substantial damage to scenic resources within a state scenic highway during construction. As indicated above, the nearest highways to the Alternative 3 site are California SR 136 and SR 190. SR 136 is not an officially designated state scenic highway. A portion of SR 190 is designated as an Officially Designated State Scenic Highway Route, but that portion is located approximately 16.7 miles from the Alternative 3 site, near the entrance to Death Valley National Park on the opposite side of the Inyo Mountain range. At this distance and topographical separation, the Alternative 3 site would not be visible from the officially designated portion of SR 190. Alternative 3 would not be located within the viewshed of an Officially Designated Scenic Highway.[15] No designated scenic highways are present in the immediate vicinity of the Alternative 3 site, and no scenic highway viewsheds would be affected by Alternative 3.

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[15] California Department of Transportation. 13 September 2012. *Eligible (E) and Officially Designated (OD) Routes*. Available at: http://www.dot.ca.gov/hq/LandArch/scenic/cahisys.htm

Therefore, Alternative 3 would not be expected to result in substantial impacts to aesthetics related to substantial damage to scenic resources within a state scenic highway.

Operations and Maintenance

The discussion regarding the location of the Alternative 3 site near a scenic highway and resources described under Construction also applies to Operation and Maintenance. Alternative 3 would not have a substantial adverse effect on natural resources near a scenic highway during operations and maintenance. No operations and maintenance related impact to resources within a state scenic highway would occur under CEQA.

(3) Substantially degrade the existing visual character or quality of the site and its surroundings?

Construction

Alternative 3 would not be expected to result in substantial impacts to aesthetics related to substantial degradation of the existing visual character of the site and its surroundings during construction. The Alternative 3 project components include temporary placement of straw bales to facilitate establishment of native vegetation, installation of native vegetation that is characteristic of stable dune structures in the Owens Lake area, a temporary access route, staging areas for equipment, water storage tanks, a temporary above-ground irrigation system, and water delivery trucks parked at the three staging areas along Old State Highway during watering events. As depicted in visual simulations, the straw bales and vegetation would be tan in color and short in height (Appendix B). The existing vegetation is also tan and short. The straw bales and vegetation would be similar in color and height to the existing native vegetation, and they would appear intermixed and compatible with the existing vegetation from a distance. The straw bales would be placed in a random pattern to mimic vegetation patterns on the Alternative 3 site. From areas adjacent to the Alternative 3 site, the straw bales' geometric shape would contrast with the natural landscape, but over time, the shape would soften as this organic material is degraded and covered by blowing sand. From adjacent areas (the community of Keeler and along SR 136) at eye level, the temporary system of white PVC irrigation pipes would be predominantly shielded from view by the straw bales, existing vegetation, and dunes in the foreground. The nearest irrigation pipe would be located approximately 690 feet away from SR 136 and appear as a white line in the distance where the dunes, existing vegetation, and straw bales do not shield it from view due to the overall flat terrain of the valley. At eye level, the white line would blend in with the visual effect of the glare reflecting off watered portions of Owens Lake. From higher elevations (on the hills and mountains east of the proposed project / proposed action site), the regular pattern of the temporary aboveground irrigation would be visible but not inconsistent among the view of other dust control measures within Owens Valley.

Temporary infrastructure elements (an access route, staging areas for equipment, water storage tanks, an aboveground irrigation system, and water delivery trucks parked at the three staging areas along Old State Highway) of Alternative 3 would also appear intermixed with the existing visual setting. The Alternative 3 project components would be visible but compatible with the existing landscape of the proposed project / proposed action site; therefore, the visual character of the site and surrounding area would appear minimally changed to viewers of Alternative 3 during construction. Short-term impacts to views from SR 136 and for recreational users would occur during construction when workers, equipment, and materials would be on the site. However, these temporary impacts to visual character would occur only during the 11-month implementation phase, and Alternative 3 would not be expected to result in substantial impacts to aesthetics related to substantial degradation of the existing visual character of the site and its surroundings during construction.

Operations and Maintenance

The visual character of the Alternative 3 site would be altered from the existing sand sheet and bare sand dunes; however, the resulting visual character is similar to other natural dune environments such as the Swansea Dunes located to the north of Alternative 3, and is compatible with the surrounding area's visual character (Figure 2.1.5.2-1). The temporary aboveground irrigation system would be removed after 3 years of vegetation establishment. The straw bales and vegetation would be similar in color and height to the existing native vegetation, and they would appear intermixed and compatible with the existing vegetation from a distance. The geometric shape of the straw bales would soften over time and as seen in previous studies for dune stabilization, the straw bales would become partially buried by moving sand and appear more as a natural element of the landscape.[16] Eventually, as the dunes become stabilized by native vegetation, the straw bales would be expected to degrade and provide organic matter to the soil.

As with the proposed project / proposed action, the water storage tanks and temporary parking of water delivery trucks at three staging areas during watering events would be visible in less than one percent of the viewshed from surrounding public viewpoints within up to 4 miles of proposed project / proposed action area from the east and would be consistent with other public infrastructure visible from the KOPs, including vehicles traveling along SR 136, vertical electrical transmission lines, sand monitoring equipment, and infrastructure associated with dust control measures on the Owens Lake bed. There would be a maximum of one water delivery truck at a time at each onsite staging area during watering events. The temporary use of small water tanks mounted to ATVs during watering events would occur approximately 1500 feet away from SR 136 and would be partially visible from KOP 1 and barely visible from KOP 2, 3, and 4 during watering events. However, the aboveground irrigation system would substantially decrease the distance of ATV trips and therefore the visibility of ATVs from the KOPs compared to the proposed project during watering events. The nearest irrigation pipe would be located approximately 690 feet away from SR 136 and appear as a white line in the distance where the dunes, existing vegetation, and straw bales do not shield it from view due to the overall flat terrain of the valley. At eye level, the white line would blend in with the visual effect of the glare reflecting off watered portions of Owens Lake. From higher elevations (on the hills and mountains east of the project site), the regular pattern of the temporary aboveground irrigation would be visible but not inconsistent among the view of other dust control measures within Owens Valley. The temporary aboveground irrigation system would be removed after 3 years of plant establishment. Therefore, operations and maintenance of Alternative 3 would not substantially degrade the visual quality of the Alternative 3 site or surrounding area based on the analysis of the viewsheds from the KOPs (see *Direct and Indirect Impacts*, above, and also Appendix B).

(4) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Construction

Alternative 3 would be expected to result in less than substantial impacts to aesthetics related to the creation of a new source of substantial light or glare during construction. There are currently no substantial sources of glare at the Alternative 3 site (e.g., mirrored buildings, building materials, etc.). The Alternative 3 project components would entail planting and establishment of native vegetation,

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[16] HydroBio Advanced Remote Sensing. October 2011. "Stabilizing Keeler Dunes Rapidly Using Native Vegetation and Minimal Inputs." Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA.

installation of straw bales as a temporary wind break, and a temporary water delivery system inclusive of an aboveground irrigation system consisting of regularly spaced white pipes. Alternative 3 does not include any building construction. There are no buildings existing on the Alternative 3 site. The installation of 2- to 6-inch diameter white PVC pipelines of the temporary irrigation system would produce a source of glare during the daytime when sunlight is present, with a potential to provide up to 12.2 miles of linear glare lines where the pipelines are not shaded by the vegetation and straw bales along the grid of pipeline. However, as the pipelines would be predominantly visually shielded from public roads including the key observation points and the shallow slope of the valley would reduce the visibility of the pipelines to a linear visual element, the visual glare from the PVC pipelines would be below the level of significance.

Alternative 3 and equipment used during construction of Alternative 3 would not create a substantial impact from nighttime light and glare. Construction activities would only occur during day light hours, and no lighting system would produce a source of nighttime light. Therefore, Alternative 3 would not be expected to result in substantial impacts to aesthetics related to the creation of a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

Operations and Maintenance

The Alternative 3 site is an undeveloped open space and is currently not a source of light and glare. The 2- and 4-inch diameter white PVC pipelines of the temporary irrigation system would be a source of glare during the daytime when sunlight is present, with a potential to provide up to 12.2 miles (0.3 acre) of linear glare lines where the pipelines are not shaded by the vegetation and straw bales along the grid of pipeline. However, as the pipelines would be predominantly visually shielded from public roads including the key observation points and the shallow slope of the valley would reduce the visibility of the pipelines to a linear visual element, the visual glare from the PVC pipelines would be below the level of significance. Additionally, over the course of the project, sand within the Keeler Dunes would slowly cover the surface of the pipelines, further obscuring them from view. Therefore, there would be no substantial impacts due to light and glare under CEQA.

4.1.3.5 Alternative 4, Dust Control Measures Applied to 194 Acres Using Irrigation Water Delivered via Water Trucks / PVC Irrigation System and Selected Manual Watering

Under Alternative 4, the dust control measures would be the same as the proposed project / proposed action (as described in Section 2.25). In Alternative 4, water obtained from the Fault Test Well would be transported to the project via water trucks and the water delivery system would be fed from three supply points along SR 136. As with Alternative 3, plants within the 95 percent control area would continue to be watered with hoses attached to the laterals of the temporary PVC irrigation system. In this alternative, water trucks would park at turnout points along SR 136 and deliver water directly in to the temporary PVC irrigation system, rather than utilizing water tanks at the staging areas for temporary storage (Table 4.1.3.5-1, *Alternative 4 Irrigation Pipeline Area*). As in Alternative 3, manual watering would be done in approximately 8 percent of the dust control area using hoses to deliver water from tanks mounted on ATVs, staged in a manner to avoid sensitive cultural resources. The ATV mounted tanks would be filled with water from the delivery system within the Alternative 4 area instead of from water storage tanks at Staging Areas 1, 2, and 3 or at the water trucks at the turnouts along SR 136. Further details of Alternative 4 are described in Section 2.2.5.

TABLE 4.1.3.5-1
ALTERNATIVE 4 IRRIGATION PIPELINE AREA

Unit	6-inch PVC Pipe - Trunk Line	4-6-inch PVC Pipe – Transmission Line	2-inch PVC Pipe – Distribution Line	Total Length of PVC Pipe
Feet of White PVC Pipeline	5,512 to 7,807 feet	10,076 feet	51,379 feet	66,967 to 69,262 feet
Miles of White PVC Pipeline	1.0 to 1.5 miles	1.9 miles	9.7 miles	12.7 to 13.1 miles

A. Direct and Indirect Impacts

Under Alternative 4, dust control measures including planting native vegetation and placing of straw bales as temporary windbreaks would be applied to a total of 194 acres of the emissive deposits in the dunes. The access routes, staging areas, and other design features would be the same as for the proposed project / proposed action, except construction would involve the additional installation of an aboveground irrigation system, and construction and operations would both involve the temporary parking of one large 8,000-gallon water delivery truck to connect to detachable hoses and the temporary irrigation system at each of three points along SR 136 for watering events. No water storage tanks would be located at the staging areas along the Old Highway as described for Alternative 3. The potential direct and indirect impacts to aesthetics and visual resources from Alternative 4 are similar to the potential direct and indirect impacts of the proposed project / proposed action, with additional visibility of the white PVC irrigation pipes and the temporarily parked water delivery trucks at three turnout points along SR 136 (see Section 4.1.3. 1). The property would continue to meet VRM Class III objectives under Alternative 4 because this alternative would result in a low to moderate change in the characteristic landscape that would not dominate the view of the casual observer. The grid lines of the aboveground irrigation lines would be predominantly shielded from view by the straw bales and dune topography, with the small visible portions of white pipe blending into the distance. The trunk lines leading to the turnout points along SR 136 would potentially be highly visible from the highway during the 3 years of temporary irrigation; as they have the potential to be highly visible, they would be painted as part of the project design before installation to match the tan and beige color of the landscape. The temporarily parked water delivery trucks would be located outside the project area within a Caltrans right-of-way along SR 136 and therefore outside the jurisdiction of BLM visual requirements.

B. CEQA Significance Determinations

Would Alternative 4:

(1) Cause a substantial adverse effect on a scenic vista, as defined in CEQA Guidelines § 21084.C?

Construction

Alternative 4 would not result in substantial impacts to aesthetics related to scenic vistas during construction. There are no scenic vistas near the Alternative 4 site; nor is Alternative 4 visible from any designated scenic vista. Therefore, Alternative 4 would not result in substantial impacts to aesthetics related to scenic vistas. The Alternative 4 project components (straw bales, vegetation, a temporary access route, staging areas for equipment, aboveground irrigation system, and water delivery trucks staged at three turnout points along SR 136) would intermix compatibly with the existing landscape, except during watering events, and the temporary aboveground irrigation system would be predominantly shielded from view by the straw bales, existing vegetation, and shallow dune slopes. Alternative 4 would not obstruct any prominent scenic vista or views open to the public or result in the creation of an aesthetically offensive site from a designated scenic public view because the Alternative 4 site and the surrounding area, as observed by its existing conditions, do not meet the criteria of a scenic vista.

Operations and Maintenance

The discussion regarding the location of the Alternative 4 site in a scenic vista described under Construction also applies to Operation and Maintenance. Alternative 4 would not have a substantial adverse effect on a scenic vista during operations and maintenance. No operations and maintenance related impact to a scenic vista would occur under CEQA.

(2) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway, as defined in CEQA Guidelines § 21084.C?

Construction

Alternative 4 would be expected to result in less than substantial impacts to aesthetics in relation to substantial damage to scenic resources within a state scenic highway during construction. As indicated above, the nearest highways to the Alternative 4 site are California SR 136 and SR 190. SR 136 is not an officially designated state scenic highway. A portion of SR 190 is designated as an Officially Designated State Scenic Highway Route, but that portion is located approximately 16.7 miles from the Alternative 4 site, near the entrance to Death Valley National Park on the opposite side of the Inyo Mountain range. At this distance and topographical separation, the Alternative 4 site would not be visible from the officially designated portion of SR 190. Alternative 4 would not be located within the viewshed of an Officially Designated Scenic Highway.[17] No designated scenic highways are present in the immediate vicinity of the Alternative 4 site and no scenic highway viewsheds would be affected by Alternative 4. Therefore, Alternative 4 would not be expected to result in substantial impacts to aesthetics related to substantial damage to scenic resources within a state scenic highway.

Operations and Maintenance

The discussion regarding the location of the Alternative 4 site near a scenic highway and resources described under Construction also applies to Operation and Maintenance. Alternative 4 would not have a substantial adverse effect on natural resources near a scenic highway during operations and maintenance. No operations and maintenance related impact to resources within a state scenic highway would occur under CEQA.

(3) Substantially degrade the existing visual character or quality of the site and its surroundings?

Construction

Alternative 4 would not be expected to result in substantial impacts to aesthetics related to substantial degradation of the existing visual character of the site and its surroundings during construction. The Alternative 4 project components include temporary placement of straw bales to facilitate

[17] California Department of Transportation. 13 September 2012. *Eligible (E) and Officially Designated (OD) Routes*. Available at: http://www.dot.ca.gov/hq/LandArch/scenic/cahisys.htm

establishment of native vegetation, installation of native vegetation that is characteristic of stable dune structures in the Owens Lake area, a temporary access route, temporary staging areas for equipment, a temporary aboveground irrigation system, and temporary water delivery trucks parked at the three turnout points along SR 136 during watering events. As depicted in visual simulations, the straw bales and vegetation would be tan in color and short in height (Appendix B). The existing vegetation is also tan and short. The straw bales and vegetation would be similar in color and height to the existing native vegetation, and they would appear intermixed and compatible with the existing vegetation from a distance. The straw bales would be placed in a random pattern to mimic vegetation patterns on the Alternative 4 site. From areas adjacent to the Alternative 4 site, the straw bales' geometric shape would contrast with the natural landscape, but over time, the shape would soften as this organic material is degraded and covered by blowing sand. From adjacent areas (the community of Keeler and along SR136) at eye level, the temporary network of white PVC irrigation pipes would be predominantly shielded from view by the straw bales, existing vegetation, and dunes in the foreground. The nearest irrigation distribution line pipe would be located approximately 690 feet away from SR 136 and appear as a white line in the distance where the dunes, existing vegetation, and straw bales do not shield it from view due to the overall flat terrain of the valley. The trunk lines leading from the distribution lines to turnout points along SR 136 would potentially be visible from three stretches totaling approximately 1,870 feet (0.4 mile) along SR 136, including KOP 3. At eye level, the white line would blend in with the visual effect of the glare reflecting off watered portions of Owens Lake. From higher elevations (on the hills and mountains east of the project site), the regular pattern of the temporary aboveground irrigation would be visible but not inconsistent among the view of other dust control measures on Owens Lake.

Temporary infrastructure elements (an access route, staging areas for equipment, an aboveground irrigation system, and water delivery trucks parked at the three turnout points along SR 136) of Alternative 4 would also appear intermixed with the existing visual setting. The Alternative 4 project components would be visible but compatible with the existing landscape of the proposed project site; therefore, the visual character of the site and surrounding area would appear minimally changed to viewers of Alternative 4 during construction. Short-term impacts to views from SR 136 and for recreational users would occur during construction when workers, equipment, and materials would be on the site. However, these temporary impacts to visual character would occur only during the 11-month implementation phase, and Alternative 4 would not be expected to result in substantial impacts to aesthetics related to substantial degradation of the existing visual character of the site and its surroundings during construction.

Operations and Maintenance

The visual character of the Alternative 4 site would be altered from the existing sand sheet and bare sand dunes; however, the resulting visual character is similar to other natural dune environments such as the Swansea Dunes located to the north of Alternative 4, and is compatible with the surrounding area's visual character (Figure 2.1.5.2-1). The temporary aboveground irrigation system would be removed after 3 years of vegetation establishment. The straw bales and vegetation would be similar in color and height to the existing native vegetation, and they would appear intermixed and compatible with the existing vegetation from a distance. The geometric shape of the straw bales would soften over time and as seen in previous studies for dune stabilization, the straw bales would become partially buried by moving sand and appear more as a natural element of the landscape.[18] Eventually, as the dunes become stabilized by native vegetation, the straw bales would be expected to degrade and

[18] HydroBio Advanced Remote Sensing. October 2011. "Stabilizing Keeler Dunes Rapidly Using Native Vegetation and Minimal Inputs." Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA.

provide organic matter to the soil. There would be a maximum of one water delivery truck at a time at each turnout point along SR 136 during watering events. The temporary parking of water delivery trucks at three points along SR 136 during watering events would be a temporary impact to the viewshed from surrounding public viewpoints within up to 2.5 miles of proposed project area from the east and would be consistent with use of turnouts off SR 136. The temporary use of small water tanks mounted to ATVs during watering events would occur approximately 1500 feet away from SR 136 and would be visible from KOP 1 and barely visible from KOP 2, 3, and 4 during watering events. However, the aboveground irrigation system would substantially decrease the distance of ATV trips and therefore the visibility of ATVs from the KOPs compared to the proposed project during watering events. The nearest irrigation distribution line pipe would be located approximately 690 feet away from the SR 136 freeway and appear as a white line in the distance where the dunes, existing vegetation, and straw bales do not shield it from view due to the overall flat terrain of the valley. The trunk lines leading from the distribution lines to SR 136 would potentially be visible from three stretches totaling approximately 1,870 feet (0.4 mile) along SR 136, including KOP 3. At eye level, the white line would blend in with the visual effect of the glare reflecting off watered portions of Owens Lake. From higher elevations (on the hills and mountains east of the project site), the regular pattern of the temporary aboveground irrigation would be visible but not inconsistent among the view of other dust control measures within Owens Valley. The temporary aboveground irrigation system would be removed after 3 years of plant establishment. Therefore, operations and maintenance of Alternative 4 would not substantially degrade the visual quality of the Alternative 4 site or surrounding area based on the analysis of the viewsheds from the KOPs (see *Direct and Indirect Impacts*, above, and also Appendix B).

(4) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Construction

Alternative 4 would be expected to result in less than substantial impacts to aesthetics related to the creation of a new source of substantial light or glare during construction. There are currently no substantial sources of glare at the Alternative 4 site (e.g., mirrored buildings, building materials, etc.). The Alternative 4 project components would entail planting and establishment of native vegetation, installation of straw bales as a temporary windbreak, and a temporary water delivery system inclusive of an aboveground irrigation system consisting of regularly spaced white pipes. Alternative 4 does not include any building construction. There are no buildings existing on the Alternative 4 site. The installation of 2- to 6-inch diameter white PVC pipelines of the temporary irrigation system would produce a source of glare during the daytime when sunlight is present, with a potential to provide up to 12.7 to 13.1 miles of linear glare lines where the pipelines are not shaded by the vegetation and straw bales along the grid of pipeline. However, as the pipelines would be predominantly visually shielded from public roads including the key observation points and the shallow slope of the valley would reduce the visibility of the pipelines to a linear visual element, the visual glare from the PVC pipelines would be below the level of significance.

Alternative 4 and equipment used during construction of Alternative 4 would not create a substantial impact from nighttime light and glare. Construction activities would only occur during day light hours, and no lighting system would produce a source of nighttime light. Therefore, Alternative 4 would not be expected to result in substantial impacts to aesthetics related to the creation of a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

Operations and Maintenance

The Alternative 4 site is an undeveloped open space and is currently not a source of light and glare. The 2- and 6-inch diameter white PVC pipelines of the temporary irrigation system would be a source of glare during the daytime when sunlight is present, with a potential to provide up to 12.7 to 13.1 miles of linear glare lines where the pipelines are not shaded by the vegetation and straw bales or covered by sand. However, as the pipelines would be predominantly visually shielded from public roads including the key observation points and the shallow slope of the valley would reduce the visibility of the pipelines to a linear visual element, the visual glare from the PVC pipelines would be below the level of significance. Therefore, there would be no substantial impacts due to light and glare under CEQA.

4.1.3.6 ALTERNATIVE 5, DUST CONTROL MEASURES APPLIED TO 194 ACRES USING IRRIGATION WATER DELIVERED VIA KCSD WATER WELL / PIPELINE TO IRRIGATION SYSTEM AND SELECTED MANUAL WATERING

Under Alternative 5, the dust control measures would be the same as the proposed project/proposed action. In Alternative 5, water obtained from the KCSD well would be transported to the project via a temporary pipeline that connects into the KCSD water system near the KCSD well site. Water would be supplied directly to the temporary irrigation system from the KCSD, in lieu of the District's Fault Test well. As with Alternatives 3 and 4, Alternative 5 would include a temporary aboveground irrigation system installed within the 95 percent control level area to provide water to the project area (Table 4.1.3.6-1, *Alternative 5 Irrigation Pipeline Area*). Plants within the sensitive 85 percent control area would be watered by hand using the same method as described above. The ATV mounted tanks would be filled with water from the delivery system within the project. Further details of Alternative 5 are described in Section 2.2.6.

TABLE 4.1.3.6-1
ALTERNATIVE 5 IRRIGATION PIPELINE AREA

Unit	4-inch PVC Pipe - Trunk Line	4-inch PVC Pipe – Transmission Line	2-inch PVC Pipe – Distribution Line	Total Length of PVC Pipe
Feet of White PVC Pipeline	1,827 feet	11,497 feet	51,379 feet	64,703 feet
Miles of White PVC Pipeline	0.4 miles	2.2 miles	9.7 miles	12.3 miles

A. Direct and Indirect Impacts

Under Alternative 5, dust control measures including planting native vegetation and placing of straw bales as temporary windbreaks would be applied to a total of 194 acres of the emissive deposits in the dunes. The access routes, staging areas and other design features would be the same as for the proposed project / proposed action, except construction would involve the additional installation of an aboveground irrigation system and construction and operations would involve the connection of the trunk line to the KCSD well instead of using water delivery trucks and water storage tanks. The potential direct and indirect impacts to aesthetics and visual resources from Alternative 5 are similar to the potential direct and indirect impacts of the proposed project / proposed action, with potential visibility of the white PVC irrigation pipes and no potential for visual impacts from the temporary water delivery trunks that would be barely visible from the KOPs for the proposed project / proposed action (see Section 4.1.3.1). The grid lines of the aboveground irrigation lines would be predominantly shielded from view by the straw bales and dune topography, with the small visible portions of white pipe blending into the distance. The trunk line leading to the KCSD well near SR 136 would potentially be highly visible from the highway during the 3 years of temporary irrigation; as it has the potential to be highly visible, it would be painted as part of the project design before installation to match the tan and beige color of the landscape. The property would continue to meet VRM Class III objectives under Alternative 5 because this alternative would result in a moderate change in the characteristic landscape that would not dominate the view of the casual observer.

B. CEQA Significance Determinations

Would Alternative 5:

(1) Cause a substantial adverse effect on a scenic vista, as defined in CEQA Guidelines § 21084.C?

Construction

Alternative 5 would not result in substantial impacts to aesthetics related to scenic vistas during construction. There are no scenic vistas near the Alternative 5 site; nor is Alternative 5 visible from any designated scenic vista. Therefore, Alternative 5 would not result in substantial impacts to aesthetics related to scenic vistas. The Alternative 5 project components (straw bales, vegetation, a temporary access route, staging areas for equipment, aboveground irrigation system, and a water delivery pipeline that would pass under SR 136 from the KCSD well) would intermix compatibly with the existing landscape, and the temporary aboveground irrigation system would be predominantly shielded from view by the straw bales, existing vegetation, and shallow dune slopes. Alternative 5 would not obstruct any prominent scenic vista or views open to the public or result in the creation of an aesthetically offensive site from a designated scenic public view.

The Alternative 5 site and the surrounding area, as observed by its existing conditions, do not meet the criteria of a scenic vista.

Operations and Maintenance

The discussion regarding the location of the Alternative 5 site in a scenic vista described under Construction also applies to Operation and Maintenance. Alternative 5 would not have a substantial adverse effect on a scenic vista during operations and maintenance. No operations and maintenance related impact to a scenic vista would occur under CEQA.

(2) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway, as defined in CEQA Guidelines § 21084.C?

Construction

Alternative 5 would be expected to result in less than substantial impacts to aesthetics in relation to substantial damage to scenic resources within a state scenic highway during construction. As indicated above, the nearest highways to the Alternative 5 site are California SR 136 and SR 190. SR 136 is not an officially designated state scenic highway. A portion of SR 190 is designated as an Officially Designated State Scenic Highway Route, but that portion is located approximately 16.7 miles from the Alternative 5 site, near the entrance to Death Valley National Park on the opposite side of the Inyo Mountain range. At this distance and topographical separation, the Alternative 5 site would not be visible from the officially designated portion of SR 190. Alternative 5 would not be located within the viewshed of an Officially Designated Scenic Highway.[19] No designated scenic highways are present in the immediate vicinity of the Alternative 5 site, and no scenic highway viewsheds would be affected by Alternative 5. Therefore, Alternative 5 would not be expected to result in substantial impacts to aesthetics related to substantial damage to scenic resources within a state scenic highway.

Operations and Maintenance

The discussion regarding the location of the Alternative 5 site near a scenic highway and resources described under Construction also applies to Operation and Maintenance. Alternative 5 would not have a substantial adverse effect on natural resources near a scenic highway during operations and maintenance. No operations and maintenance related impact to resources within a state scenic highway would occur under CEQA.

(3) Substantially degrade the existing visual character or quality of the site and its surroundings?

Construction

Alternative 5 would not be expected to result in substantial impacts to aesthetics related to substantial degradation of the existing visual character of the site and its surroundings during construction. The Alternative 5 project components include temporary placement of straw bales to facilitate establishment of native vegetation, installation of native vegetation that is characteristic of stable dune structures in the Owens Lake area, a temporary access route, staging areas for equipment, a temporary aboveground irrigation system, and installation of a temporary pipeline to connect the irrigation system to the KCSD well. As depicted in visual simulations, the straw bales and vegetation would be tan in color and short in height (Appendix B). The existing vegetation is also tan and short. The straw bales and vegetation would be similar in color and height to the existing native vegetation, and they would appear intermixed and compatible with the existing vegetation from a distance. The straw bales would be placed in a random pattern to mimic vegetation patterns on the Alternative 5 site. From areas adjacent to the Alternative 5 site, the straw bales' geometric shape would contrast with the natural landscape, but over time, the shape would soften as this organic material is degraded and covered by blowing sand. From adjacent areas (the community of Keeler and along the 136 freeway) at eye level, the temporary network of white PVC irrigation pipes would be predominantly shielded from view by the straw bales, existing vegetation, and dunes in the foreground. The nearest irrigation distribution line pipe would be located approximately 690 feet away from the SR 136 freeway and appear as a white line in the distance where the dunes, existing vegetation, and straw bales do not shield it from view due to the overall flat terrain of the valley. The trunk line leading from the distribution lines under SR 136 would potentially be visible from one stretch of approximately 818 feet (0.2 mile) along SR 136, including KOP 2. At eye level, the white line would blend in with the visual effect of the glare reflecting off watered portions of Owens Lake. From higher elevations (on the hills and mountains east of the project site), the regular pattern of the temporary aboveground irrigation would be visible but not inconsistent among the view of other dust control measures on Owens Lake.

Temporary infrastructure elements (an access route, staging areas for equipment, an aboveground irrigation system, and a pipeline to connect the irrigation system to the KCSD well) of Alternative 5 would also appear intermixed with the existing visual setting. The Alternative 5 project components

[19] California Department of Transportation. 13 September 2012. *Eligible (E) and Officially Designated (OD) Routes*. Available at: http://www.dot.ca.gov/hq/LandArch/scenic/cahisys.htm

would be visible but compatible with the existing landscape of the proposed project site; therefore, the visual character of the site and surrounding area would appear minimally changed to viewers of Alternative 5 during construction. Short-term impacts to views from SR 136 and for recreational users would occur during construction when workers, equipment, and materials would be on the site. However, these temporary impacts to visual character would occur only during the 11-month implementation phase, and Alternative 5 would not be expected to result in substantial impacts to aesthetics related to substantial degradation of the existing visual character of the site and its surroundings during construction.

Operations and Maintenance

The visual character of the Alternative 5 site would be altered from the existing sand sheet and bare sand dunes; however, the resulting visual character is similar to other natural dune environments such as the Swansea Dunes located to the north of Alternative 5, and is compatible with the surrounding area's visual character (Figure 2.1.5.2-1). The temporary aboveground irrigation system would be removed after 3 years of vegetation establishment. The straw bales and vegetation would be similar in color and height to the existing native vegetation, and they would appear intermixed and compatible with the existing vegetation from a distance. The geometric shape of the straw bales would soften over time and as seen in previous studies for dune stabilization, the straw bales would become partially buried by moving sand and appear more as a natural element of the landscape.[20] Eventually, as the dunes become stabilized by native vegetation, the straw bales would be expected to degrade and provide organic matter to the soil. The connection to the KCSD well reduces the visibility of the dust control measures beyond the visibility of the proposed project / proposed action. The white irrigation pipelines would be visible from surrounding public viewpoints within up to 1.6 miles of project area from the east and from nearby peaks overlooking the entire pattern of Owens Lake dust control measures, and would be consistent with other public infrastructure visible from the KOPs, including SR 136, vertical electrical transmission lines, sand monitoring equipment, and infrastructure associated with dust control measures on the Owens Lake bed. The temporary use of small water tanks mounted to ATVs during watering events would occur approximately 1500 feet away from SR 136 and would be visible from KOP 1 and barely visible from KOP 2, 3, and 4 during watering events. However, the aboveground irrigation system would substantially decrease the distance of ATV trips and therefore the visibility of ATVs from the KOPs compared to the proposed project during watering events.

The nearest irrigation distribution line pipe would be located approximately 690 feet away from the SR 136 freeway and appear as a white line in the distance where the dunes, existing vegetation, and straw bales do not shield it from view due to the overall flat terrain of the valley. The trunk line leading from the KCSD water system under SR 136 would potentially be visible from one stretch along SR 136, including KOP 2. At eye level, the beige/tan painted trunk line would blend in with the visual effect of the glare reflecting off watered portions of Owens Lake. From higher elevations (on the hills and mountains east of the project site), the regular pattern of the temporary aboveground irrigation would be visible but not inconsistent among the view of other dust control measures on Owens Lake. The temporary aboveground irrigation system would be removed after 3 years of plant establishment. Therefore, operations and maintenance of Alternative 5 would not substantially degrade the visual quality of the Alternative 5 site or surrounding area based on the analysis of the viewsheds from the KOPs (see *Direct and Indirect Impacts*, above, and also Appendix B).

[20] HydroBio Advanced Remote Sensing. October 2011. "Stabilizing Keeler Dunes Rapidly Using Native Vegetation and Minimal Inputs." Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA.

(4) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Construction

Alternative 5 would be expected to result in less than substantial impacts to aesthetics related to the creation of a new source of substantial light or glare during construction. There are currently no substantial sources of glare at the Alternative 5 site (e.g., mirrored buildings, building materials, etc.). The Alternative 5 project components would entail planting and establishment of native vegetation, installation of straw bales as a temporary windbreak, and a temporary water delivery system inclusive of an aboveground irrigation system consisting of regularly spaced white pipes. Alternative 5 does not include any building construction. There are no buildings existing on the Alternative 5 site. The installation of 2- to 6-inch diameter white PVC pipelines of the temporary irrigation system has the potential to produce a source of glare during the daytime when sunlight is present, with a possibility to provide up to 12.3 miles of linear glare lines where the pipelines are not shaded by the vegetation and straw bales along the pipeline system. However, as the pipelines would be predominantly visually shielded from public roads including the key observation points and the shallow slope of the valley would reduce the visibility of the pipelines to a linear visual element, the visual glare from the PVC pipelines would be below the level of significance.

Alternative 5 and equipment used during construction of Alternative 5 would not create a substantial impact from nighttime light and glare. Construction activities would only occur during day light hours, and no lighting system would produce a source of nighttime light. Therefore, Alternative 5 would not be expected to result in substantial impacts to aesthetics related to the creation of a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

Operations and Maintenance

The Alternative 5 site is an undeveloped open space and is currently not a source of light and glare. The 2- and 6-inch diameter white PVC pipelines of the temporary irrigation system might be a source of glare during the daytime when sunlight is present, with a potential to provide up to 12.3 miles of linear glare lines where the pipelines are not shaded by the vegetation and straw bales along the grid of pipeline. However, as the pipelines would be predominantly visually shielded from public roads including the key observation points and the shallow slope of the valley would reduce the visibility of the pipelines to a linear visual element, the visual glare from the PVC pipelines would be below the level of significance. Therefore, there would be no substantial impacts due to light and glare under CEQA.

4.1.3.7 ALTERNATIVE 6, NO PROJECT / NO ACTION ALTERNATIVE

The No Project / No Action Alternative assumes that the dust control measures would not be installed. The No Project / No Action Alternative would not require a federal approval as no BLM land would be crossed. Under CEQA, continuation of natural habitats would be expected based on the current General Plan and Land Use Ordinance designations.

The sand dunes on the project site would continue to migrate to the south-southeast toward the community of Keeler, thus continuing the existing condition of obscured visibility from wind-blown sands and fine particulates.

A. Direct and Indirect Impacts

Under Alternative 6, there would be no installation or maintenance activities; therefore, there would be no potential for direct or indirect impacts to aesthetics or visual resources.

B. CEQA Significance Determinations

Under Alternative 6, there would be no effect on aesthetics or visual resources.

4.1.4 MITIGATION MEASURES

Only temporary short-term impacts to visual character during construction would occur as a result of implementation of the proposed project / proposed action and Alternatives 1, 2, 3, 4, and 5. The visual glare that would result from the temporary aboveground irrigation system specified in Alternatives 3, 4, and 5 would produce an impact below the level of significance. Therefore, there are no mitigation measures proposed.

4.1.5 RESIDUAL IMPACTS AFTER MITIGATION

The Proposed Project / Proposed Action, Proposed Project / Proposed Action Alternatives 1-5, and Alternative 6 would not result in a substantial adverse impact related to visual resources, light, or glare under CEQA; therefore, no mitigation is required.

4.2 AIR QUALITY

Information contained in this section is summarized from the Air Quality and Greenhouse Gases Technical Report (Appendix C, *Air Quality and Greenhouse Gas Emissions Technical Report*).

4.2.1 STUDY METHODS

The potential for impacts to air quality has been analyzed in accordance with Appendix G of the State CEQA Guidelines[1] and the methodologies and significance thresholds provided by the Inyo County General Plan,[2] the National Ambient Air Quality Standards (NAAQS),[3] the California Ambient Air Quality Standards (CAAQS),[4] the Clean Air Act (CAA),[5] and the Air Quality and Greenhouse Gas Emissions Technical Report prepared for the proposed project / proposed action (Appendix C).[6]

4.2.1.1 CONSTRUCTION EMISSIONS CALCULATIONS

The California Emissions Estimator Model (CalEEMod 2013.2.2[7]) was used to estimate construction emissions from site preparation, delivery and placement of straw bales, delivery and placement of native plants, and the periodic watering of plants. CalEEMod is a statewide computer model that quantifies criteria pollutants and GHG emissions associated with the construction and operation of a variety of land use development projects. The model analyzes at the air district, county, air basin or statewide level (Appendix C). CalEEMod can be used to estimate criteria pollutant emissions associated with land development projects such as residential neighborhoods, shopping centers, and office buildings; area sources such as gas appliances, wood stoves, fireplaces, and landscape maintenance equipment; and construction projects.

4.2.1.2 CONSTRUCTION ASSUMPTIONS

The proposed project / proposed action consists of placement of straw bales as a temporary dust control measure on the site and planting of native vegetation for long-term dust control. The proposed project / proposed action would involve short-term construction impacts for brushing and grubbing temporary access routes and brushing and grubbing staging areas and ATVs traversing the site associated with the planting of native plants and placing of straw bales. The operational impacts would consist of periodic worker trips to the site to monitor the operation and maintenance of the dust control measures, conduct supplemental watering and to service monitoring equipment. The proposed project / proposed action would not generate long-term trips related to its operation. The primary

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[1] *California Code of Regulations*. Title 14, Division 6, Chapter 3, Sections 15000–15387, Appendix G.

[2] Inyo County Planning Department. December 2001. *Inyo County General Plan, Public Safety Element*. Independence, CA.

[3] U.S. Environmental Protection Agency. Updated 20 October 2008. *National Ambient Air Quality Standards (NAAQS)*. Available at: http://www.epa.gov/air/criteria.html.

[4] Air Resources Board. Reviewed 5 March 2008. *California Ambient Air Quality Standards (CAAQS)*. Available at: http://www.arb.ca.gov/research/aaqs/caaqs/caaqs.htm.

[5] U.S. Environmental Protection Agency. 2005. Federal Clean Air Act, Title I, Air Pollution Prevention and Control. Available at: http://www.epa.gov/oar/caa/contents.html

[6] Sapphos Environmental, Inc. November 2012. *Keeler Dunes Dust Control Project Project Air Quality and Greenhouse Gas Emissions Technical Impact Report*. Pasadena, CA.

[7] South Coast Air Quality Management District. 11 February 2011. Web site. "CalEEMod 2013.2.2Program." Available at: http://caleemod.com/

purpose of the proposed project / proposed action is to reduce PM_{10} emissions. Once the plants are established, the project site would provide long-term sequestration of CO_2 emissions.

The plans and specifications for the proposed project / proposed action would include the requirement for construction equipment and average number of hours of operation of the type specified in Table 2.1.5.2-2, *Dust Control Activity, Duration, Equipment, and Workers*. Table 2.1.5.2-2, lists the duration of each activity, types of equipment, and a maximum number of workers on the site each day.

Site ingress and egress locations for construction, delivery vehicles, haul routes, and emergency response and evacuation would be located at three entrance/exit access ways along the Old State Highway (Figure 1.3.1-1, *Regional Vicinity Map*).

The impacts associated with the worse-case day of projected emissions were used to determine potential impacts for the proposed project / proposed action.

4.2.1.3 OPERATIONS AND MAINTENANCE CALCULATIONS

Operational equipment emissions, for maintenance and monitoring phase of the project, were calculated assuming a staff of 10 employees watering plants for a total of 100 days per year of equipment use, for a maximum 3-year time period. The CalEEMod emissions model was used to calculate emissions from operational equipment and employee commute trips.

4.2.1.4 OPERATIONS AND MAINTENANCE ASSUMPTIONS

Once the proposed project / proposed action elements are in place, the site would be monitored for a period of 3 years to evaluate the vegetation growth progress, assess plant mortality and predation, provide supplemental water (up to twice per year), check the physical condition of straw bales, and supplement native vegetation during the optimal planting season (fall season). Monitoring for plant survivorship will occur more frequently in the first year of the proposed project / proposed action and less frequently as the plants establish themselves. Review of DCM effectiveness and monitoring data would be completed at least one time per year and would be evaluated to determine the success of the project and for determining the need for adding supplemental plants and/or straw bales as needed to achieve the NAAQS for PM_{10}. The data documenting the result of the effectiveness of the DCMs would be available to BLM upon request.

4.2.2 CEQA SIGNIFICANCE CRITERIA / NEPA REQUIREMENTS

For purposes of the analysis, the CEQA Significance Determinations and NEPA Requirements are discussed concurrently where applicable (i.e. with regard to CEQA Guidelines criterion). For NEPA disclosure, the impact analysis is referring to the proposed project / proposed action or an alternative. Direct natural resource impacts from the proposed project / proposed action or an alternative are related to air quality emissions (e.g. pollutant generated during operation of construction equipment and vehicle trips) generated during construction and maintenance. Indirect effects (or impacts) are those that could result from the proposed project / proposed action or an alternative, but are later in time (for example after construction and maintenance) or further removed in distance (for example, several miles from the project site).

4.2.2.1 CEQA Significance Criteria

The potential for the proposed project to result in impacts to air quality was analyzed in relation to the questions contained in Appendix G of the State CEQA Guidelines. Under CEQA, the potential for the proposed project or project alternatives to result in impacts related to air quality was analyzed in relation to the questions contained in Appendix G of the State CEQA Guidelines. A significant impact on air quality would normally be determined to occur if the project or project alternatives triggered one of the five thresholds established by Appendix G of the CEQA Guidelines:

Would the proposed project have any of the following effects:

(1) Conflict with or obstruct implementation of the applicable air quality plan?

(2) Violate any air quality standard or contribute substantially to existing or projected air violations?

Great Basin Unified Air Pollution Control District Air Quality Impact Assessment Screening Thresholds

The OVPA is currently classified non-attainment for PM_{10} and classified attainment for O_3, CO, Pb, NO_x, $PM_{2.5}$, and SO_2. The District is required to comply with the emission thresholds for all federally regulated air pollutants. The proposed project would have a potentially significant impact if it does the following:

- Construction or operation of the proposed project results in 70 tons per year of more of PM_{10}
- The proposed project is not consistent with adopted federal or state Air Quality Attainment Plans

(3) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

(4) Expose sensitive receptors to substantial pollutant concentrations?

(5) Create objectionable odors affecting a substantial number of people?

4.2.2.2 NEPA Requirements

The proposed action is located primarily on BLM-administrated land, and the BLM is required to demonstrate that it would undertake, approve, permit, or support an action that would conform to the SIP. The proposed action would be located in an area that is designated as non-attainment for PM_{10} pursuant to the provisions of the federal CAA. The proposed action would trigger a conformity determination if it does the following:

- Total direct and indirect PM_{10} emissions in serious non-attainment area equal or exceed 70 tons per year

4.2.3 ENVIRONMENTAL CONSEQUENCES

4.2.3.1 PROPOSED PROJECT / PROPOSED ACTION, DUST CONTROL MEASURES APPLIED TO 94 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / ATVS

A. Direct and Indirect Impacts

Applicable Plans

The purpose of the proposed project / proposed action, in combination with other on-going dust control projects that have been and are being implemented on the bed of Owens Lake, is to improve air quality through the reduction of PM_{10} emissions throughout the Owens Valley Planning Area (OVPA), consistent with the 2008 Owens Valley SIP. Because dust from the Keeler Dunes continues to cause PM_{10} exceedances, the implementation of the Keeler Dunes dust control project is required in the SIP as part of the overall strategy to attain the federal standard.

Air Quality Standards

The purpose of this project is to reduce the exposure of residents and workers of the communities of Keeler and Swansea and travelers through the area to unhealthful levels of PM_{10} emissions. Dust control measures are necessary at the Keeler Dunes to bring the communities of Keeler and Swansea into compliance with the Federal and California PM_{10} standards and to bring the OVPA into attainment with the NAAQS.

The potential of the proposed project / proposed action to be subject to the conformity determination with the federal CAA and the NAAQS was analyzed. The General Conformity Rule requires the evaluation of the proposed project / proposed action's emissions against the *de minimis* level for all nonattainment pollutants in order to determine if the proposed project / proposed action would be subject to a conformity determination. The OVPA is designated as nonattainment area for PM_{10} emissions; therefore the proposed project / proposed action's annual unmitigated estimated construction and operational emissions were compared to the *de minimis* level for PM_{10} emissions (Table 4.2.3.1-1, *Conformity Determination*). Due to the fact that emissions of PM_{10} would be expected to be below the *de minimis* threshold and that the overall purpose of the project is to reduce PM_{10} emissions, the project would not be subject to a conformity determination.

TABLE 4.2.3.1-1
CONFORMITY DETERMINATION

Proposed Project / Proposed Action	Annual Unmitigated Estimated Nonattainment Air Pollutants (Metric Tons/Year)
	PM_{10}
Construction	32.56
Operation	12.42
De Minimis Level	70
Subject to Conformity Determination?	No

Criteria Pollutants

Construction. The project generates *de minimis* levels of criteria pollutants from daily regional construction emissions (Table 4.2.3.1-2, *Unmitigated Estimated Daily Regional Construction Emissions)*.

TABLE 4.2.3.1-2
UNMITIGATED ESTIMATED DAILY REGIONAL CONSTRUCTION EMISSIONS

Off-Road Emission Sources	Construction Emissions (Pounds/Day)					
	VOCs	NOx	CO	SOx	$PM_{2.5}$	PM_{10}
Site Preparation	8.98	102.12	45.57	0.09	4.23	5.64
Distribute straw bales on sand dunes	16.60	187.66	106.26	0.16	14.69	22.21
Planting and watering	56.67	660.60	328.34	0.65	35.46	48.09
Clean up and restoration	18.10	205.61	114.21	0.18	15.22	21.91
Maximum Off-road Emissions	**56.67**	**660.60**	**328.34**	**0.65**	**35.46**	**48.09**
Mobile Sources	**VOCs**	**NO_x**	**CO**	**SO_x**	**$PM_{2.5}$**	**PM_{10}**
Delivery trucks and employee commutes	0.25	0.31	3.62	0.00	41.97	420.41
Maximum Regional Total	**56.91**	**660.90**	**331.96**	**0.65**	**77.43**	**468.50**
Significant? *	NA	NA	NA	NA	NA	NA

Note: * The District does not have daily CEQA thresholds for criteria pollutants. US EPA annual *de minimis* thresholds were used to determine potential impacts.
NA: Not Applicable
Source: Sapphos Environmental, Inc., CalEEMod Output for the proposed project / proposed action

The annual regional construction emissions associated with construction would not be expected to exceed the U.S. EPA *de minimis* threshold for PM_{10} (Table 4.2.3.1-3, *Unmitigated Estimated Annual Regional Construction Emissions*).

TABLE 4.2.3.1-3
UNMITIGATED ESTIMATED ANNUAL REGIONAL CONSTRUCTION EMISSIONS

Emission Source	Air Pollutant Emissions (Metric Tons/Year)					
	VOCs	NO_x	CO	SO_x	$PM_{2.5}$	PM_{10}
Maximum off-road construction emissions	0.00	0.01	0.14	0.00	1.52	15.25
Delivery trucks and employee commutes	2.27	26.42	13.13	0.03	1.42	1.92
Maximum Regional Total	**3.48**	**39.93**	**21.00**	**0.04**	**5.36**	**32.56**
US EPA *De Minimis* Thresholds (Tons/Year)*	50	100	NA	NA	NA	70
Significant?	No	No	NA	NA	NA	No

Note: * The District does not have CEQA thresholds for criteria pollutants. The US EPA *de minimis* thresholds have been used to determine potential impact.
NA: Not Applicable
Source: Sapphos Environmental, Inc., CalEEMod Output for the proposed project / proposed action

Operations and Maintenance. The estimated daily operational emissions of PM_{10} for the monitoring phase of the proposed project / proposed action including mobile-source emissions due to employee commute trips would be below the U.S. EPA *de minimis* thresholds (Table 4.2.3.1-4, *Unmitigated Estimated Daily Operational Emissions)*. Operational air emissions at the proposed project / proposed action property are likely to result from mobile sources due to monitoring activities and annual watering, as needed.

TABLE 4.2.3.1-4
UNMITIGATED ESTIMATED DAILY OPERATIONAL EMISSIONS

Emission Sources	Air Pollutants (Pounds/Day)					
	VOCs	NO_x	CO	SO_x	$PM_{2.5}$	PM_{10}
Operational equipment	15.27	176.09	107.19	0.15	16.84	25.81
ATVs	0.07	0.03	0.40	0.00	2.27	22.72
Water Trucks	5.15	60.69	27.30	0.07	2.16	2.58
Total	**20.49**	**236.81**	**134.89**	**0.22**	**21.27**	**51.11**
Mobile Sources	0.03	0.01	0.18	0.00	1.01	10.10
Total Emissions	**20.52**	**236.82**	**135.07**	**0.22**	**22.28**	**62.21**
Significance?*	NA	NA	NA	NA	NA	NA

Note: * The District does not have CEQA thresholds for criteria pollutants. The US EPA *de minimis* thresholds have been used to determine potential impact.
NA: Not Applicable
Source: Sapphos Environmental, Inc., CalEEMod output for the proposed project / proposed action

The annual operational emissions of PM_{10} for the monitoring phase of the proposed project / proposed action would be below the U.S. EPA *de minimis* thresholds (Table 4.2.3.1-5, *Unmitigated Estimated Annual Operational Emissions*). It is also important to note that the estimated emissions are likely to be higher than actual emissions from the proposed project / proposed action due to the conservative assumptions used for emission modeling. The long-term goal of the proposed project / proposed action is the establishment of a self-sustaining native vegetation cover to control dust with minimal long-term maintenance; therefore, operation and maintenance and associated emissions would be expected to be minimal after the initial 3 years following construction. The purpose of the proposed project / proposed action would be to reduce PM_{10} emissions through vegetation establishment. As evidenced by the results of the pilot study, the proposed project / proposed action would result in improved air quality immediately following installation of the straw bales, specifically related to net reductions in PM_{10} emissions.

TABLE 4.2.3.1-5
UNMITIGATED ESTIMATED ANNUAL OPERATIONAL EMISSIONS

Emission Sources	Air Pollutants (Tons/Year)					
	VOCs	**NO_x**	**CO**	**SO_x**	**$PM_{2.5}$**	**PM_{10}**
Operational equipment	1.99	22.98	13.99	0.02	4.79	8.14
ATVs	0.00	0.00	0.06	0.00	0.27	2.69
Water Trucks	0.67	7.92	3.56	0.00	0.29	0.40
Total	**2.66**	**30.90**	**17.61**	**0.02**	**5.35**	**11.23**
Mobile Sources	0.00	0.00	0.03	0.00	0.12	1.19
Total Emissions	**2.66**	**30.90**	**17.64**	**0.02**	**5.47**	**12.42**
US EPA *De Minimis* Threshold	50	100	NA	NA	NA	70
Exceedance of Significance?	No	No	NA	NA	NA	No

Notes: * The District does not have CEQA thresholds for criteria pollutants. The US EPA *de minimis* thresholds have been used to determine potential impact.
Annual operational equipment and mobile-source emissions are calculated assuming 100 working days per year.
Source: Sapphos Environmental, Inc., CalEEMod output for the proposed project / proposed action; see Appendix C

Sensitive Receptors

Carbon Monoxide. CO is considered a localized problem and requires additional analysis when a proposed project / proposed action would be expected to expose sensitive receptors to localized levels of CO concentrations from vehicles, which are known as CO "hotspots." Due to the low number of vehicle trips anticipated for the proposed project / proposed action (8–10 per day), there would be no substantial increase in CO concentrations at sensitive receptor locations.

Toxic Air Contaminants (TACs). TACs impacts at the proposed project / proposed action property would result primarily from diesel particulate emissions associated with heavy-duty equipment operations. The operation of the proposed project / proposed action would not generate a substantial number of heavy-duty equipment operations or daily truck trips. Water truck trips during annual watering would be the primary contributor to the TAC level at the proposed project / proposed action property. However, the number of heavy-duty delivery trucks accessing the proposed project / proposed action property on a daily basis would be minimal, and the proposed project / proposed action area is remote and largely unpopulated; therefore, TAC emissions would not occur in large concentrations in populated areas and would be minor in nature and duration and would not adversely affect human health.

Visibility-reducing Particles. The threshold for visibility under the CAAQS is correlated with the standard extinction coefficient of 0.23 per kilometer. The construction and operations and maintenance phases of the proposed project / proposed action would not generate area-source emissions that would be expected to impair visibility. Rather the proposed project / proposed action would be expected to substantially reduce existing dust emissions from the Keeler Dunes that currently impair visibility in the nearby community of Keeler and on adjacent SR 136.

Odors

Construction of the proposed project / proposed action would be required to comply with District Rule 419. Potential sources of odors at the proposed project / proposed action property would be those emitted from equipment exhaust. The construction of the proposed project / proposed action would use typical construction equipment and odors at the proposed project / proposed action property would be typical for most construction sites. The project construction has a relatively short-term schedule and odors would be expected to be localized and confined to within ¼ mile of the proposed project / proposed action property; therefore, there would be no anticipated nuisance odors.

B. CEQA Significance Determinations

Would the proposed project / proposed action have any of the following effects:

(1) Conflict with or obstruct implementation of the applicable air quality plan?

The proposed project / proposed action would not have any impact related to conflicts with the applicable air quality plan, the 2008 Owens Valley PM_{10} Demonstration of Attainment State Implementation Plan. The proposed project / proposed action has been designed to facilitate implementation of elements of the plan related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS.

(2) Violate any air quality standard or contribute substantially to existing or projected air violations?

The proposed project / proposed action would not have any significant impact to air quality related to a violation of an air quality standard or contribution to an existing or projected air violation. The proposed project / proposed action has been designed to facilitate implementation of elements of the 2008 Owens Valley PM_{10} Demonstration of Attainment State Implementation Plan related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS.

(3) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

The proposed project / proposed action would not contribute to a cumulatively considerable net increase in any criteria pollutant for which the project region is non-attainment. The OVPA is non-attainment for PM_{10} emissions. The proposed project / proposed action has been designed to facilitate implementation of elements of the 2008 SIP related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS.

(4) Expose sensitive receptors to substantial pollutant concentrations?

The proposed project / proposed action would result in less than significant impacts to air quality as a result of exposure of sensitive receptors to substantial pollutant concentrations of carbon monoxide, toxic air contaminants, or visibility-reducing particles. Implementation of the proposed project / proposed action would have a net benefit in relation to reduction of exposure of sensitive receptors in the communities of Keeler and Swansea.

(5) Create objectionable odors affecting a substantial number of people?

The proposed project / proposed action would result in less than significant impacts to air quality related to the creation of objectionable odors. The proposed project / proposed action is located approximately 0.5 mile away from the nearest population, the community of Keeler. Construction emissions would be expected to be confined within ¼ mile of the construction site, and be limited in duration due to the less than one year construction period and relatively low levels of equipment required.

4.2.3.2 Alternative 1, Dust Control Measures Applied to 214 Acres Using Irrigation Water Delivered via Water Trucks / ATVs

Under Alternative 1, construction would be essentially the same as for the proposed project / proposed action (as described in Section 2.2.2). The primary difference between the alternatives would be the total number of plants and straw bales that would be transported to the project site and distributed onto a larger area (20 additional acres) of dust control. Alternative 1 would result in a greater number of plants and straw bales; hence, additional workers and equipment may be necessary to complete the alternative in the same time frame as the proposed project / proposed action. As with the proposed project / proposed action, supplemental irrigation in the first 3 years following installation of native vegetation would be completed via hauling of water in small water tanks (about 150–200 gallons) mounted on a trailer and pulled with an ATV and then irrigation would be conducted by hand through a small diameter hose.

A. Direct and Indirect Impacts

Applicable Plans

As with the proposed action, Alternative 1 would implement dust control measures at Keeler Dunes intended to demonstrate compliance with the 2008 SIP. As with the proposed project / proposed action, Alternative 1 is designed to facilitate implementation of elements of the plan related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS. Therefore, the air quality impacts of Alternative 1 would be the same as the proposed project / proposed action.

Air Quality Standards

As with the proposed project / proposed action, Alternative 1 would not violate an air quality standard or contribute to an existing or projected air violation. As with the proposed project / proposed action, Alternative 1 is designed to facilitate implementation of elements of the 2008 SIP related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS. Due to the fact that emissions of PM_{10} would be expected to be below the *de minimis* threshold and that the overall purpose of the project is to reduce PM_{10} emissions, Alternative 1 would not be subject to a conformity determination (Table 4.2.3.2-1, *Conformity Determination for Alternative 1*).

TABLE 4.2.3.2-1
CONFORMITY DETERMINATION FOR ALTERNATIVE 1

Proposed Project / Proposed Action	Annual Unmitigated Estimated Nonattainment Air Pollutants (Tons/Year)
	PM_{10}
Construction	32.58
Operation	12.28
De Minimis Level[1]	70
Subject to Conformity Determination?[2]	No

Criteria Pollutants

Construction. As with the proposed project / proposed action, Alternative 1 generates *de minimis* levels of criteria pollutants from daily regional construction emissions (Table 4.2.3.2-2, *Unmitigated Estimated Daily Regional Construction Emissions for Alternative 1).*

TABLE 4.2.3.2-2
UNMITIGATED ESTIMATED DAILY REGIONAL CONSTRUCTION EMISSIONS FOR ALTERNATIVE 1

Off-Road Emission Sources	Construction Emissions (Pounds/Day)					
	VOCs	NOx	CO	SOx	$PM_{2.5}$	PM_{10}
Site Preparation	8.98	102.12	45.57	0.09	4.23	5.64
Distribute straw bales on sand dunes	16.60	187.66	106.26	0.16	14.71	22.37
Planting and watering	56.67	660.60	328.34	0.65	35.49	48.35
Clean up and restoration	18.10	205.61	114.21	0.18	15.22	21.91
Maximum Off-road Emissions	**56.67**	**660.60**	**328.34**	**0.65**	**35.49**	**48.35**
Mobile Sources	**VOCs**	**NO_x**	**CO**	**SO_x**	**$PM_{2.5}$**	**PM_{10}**
Delivery trucks and employee commutes	0.25	0.31	3.62	0.00	41.97	420.41
Maximum Regional Total	**56.91**	**660.90**	**331.96**	**0.65**	**77.46**	**468.76**
Significant? *	NA	NA	NA	NA	NA	NA

Note: * The District does not have daily CEQA thresholds for criteria pollutants. US EPA annual *de minimis* thresholds were used to determine potential impacts.
NA: Not Applicable
Source: Sapphos Environmental, Inc., CalEEMod Output for the proposed project / proposed action

As with the proposed project / proposed action, Alternative 1 generates *de minimis* levels of criteria pollutants from annual regional construction emissions (Table 4.2.3.2-3, *Unmitigated Estimated Annual Regional Construction Emissions for Alternative 1).*

TABLE 4.2.3.2-3
UNMITIGATED ESTIMATED ANNUAL REGIONAL CONSTRUCTION EMISSIONS FOR ALTERNATIVE 1

Emission Source	Air Pollutant Emissions (Tons/Year)					
	VOCs	NO_x	CO	SO_x	$PM_{2.5}$	PM_{10}
Maximum off-road construction emissions	0.00	0.01	0.14	0.00	1.52	15.25
Delivery trucks and employee commutes	2.27	26.42	13.13	0.03	1.42	1.93
Maximum Regional Total	**3.48**	**39.93**	**21.00**	**0.04**	**5.36**	**32.58**
US EPA *De Minimis* Thresholds (Tons/Year)*	50	100	NA	NA	NA	70
Significant?	No	No	NA	NA	NA	No

Note: * The District does not have CEQA thresholds for criteria pollutants. The US EPA *de minimis* thresholds have been used to determine potential impact.
NA: Not Applicable
Source: Sapphos Environmental, Inc., CalEEMod Output for the proposed project / proposed action

Operations and Maintenance. As with the proposed project / proposed action, the estimated daily operational emissions of PM_{10} for the monitoring phase of Alternative 1, including mobile-source emissions due to employee commute trips, would be below the U.S. EPA *de minimis* thresholds (Table 4.2.3.2-4, *Unmitigated Estimated Daily Operational Emissions for Alternative 1*).

TABLE 4.2.3.2-4
UNMITIGATED ESTIMATED DAILY OPERATIONAL EMISSIONS FOR ALTERNATIVE 1

Emission Sources	Air Pollutants (Pounds/Day)					
	VOCs	NO_x	CO	SO_x	$PM_{2.5}$	PM_{10}
Operational equipment	15.27	176.09	107.19	0.15	16.85	25.84
ATVs	0.07	0.03	0.39	0.00	2.22	22.21
Water Trucks	5.15	60.69	27.30	0.07	2.13	2.32
Total	**20.49**	**236.81**	**134.88**	**0.22**	**21.20**	**50.37**
Mobile Sources	0.03	0.01	0.18	0.00	1.01	10.10
Total Emissions	**20.52**	**236.82**	**135.06**	**0.22**	**22.21**	**60.47**
Significance?*	NA	NA	NA	NA	NA	NA

Note: * The District does not have CEQA thresholds for criteria pollutants. The US EPA *de minimis* thresholds have been used to determine potential impact.
NA: Not Applicable
Source: Sapphos Environmental, Inc., CalEEMod output for the proposed project / proposed action

As with the proposed project / proposed action, the estimated annual operational emissions of PM_{10} for the monitoring phase of the Alternative 1, including mobile-source emissions due to employee commute trips, would be below the U.S. EPA *de minimis* thresholds (Table 4.2.3.2-5, *Unmitigated Estimated Annual Operational Emissions for Alternative 1*).

TABLE 4.2.3.2-5
UNMITIGATED ESTIMATED ANNUAL OPERATIONAL EMISSIONS
FOR ALTERNATIVE 1

Emission Sources	Air Pollutants (Tons/Year)					
	VOCs	NO_x	CO	SO_x	$PM_{2.5}$	PM_{10}
Operational equipment	1.99	22.98	13.99	0.02	4.79	8.15
ATVs	0.00	0.00	0.06	0.00	0.26	2.63
Water Trucks	0.67	7.92	3.56	0.00	0.28	0.31
Total	**2.66**	**30.90**	**17.61**	**0.02**	**5.33**	**11.09**
Mobile Sources	0.00	0.00	0.03	0.00	0.12	1.19
Total Emissions	**2.66**	**30.90**	**17.64**	**0.02**	**5.45**	**12.28**
US EPA *De Minimis* Threshold	50	100	NA	NA	NA	70
Exceedance of Significance?	No	No	NA	NA	NA	No

Notes: * The District does not have CEQA thresholds for criteria pollutants. The US EPA *de minimis* thresholds have been used to determine potential impact.
Annual operational equipment and mobile-source emissions are calculated assuming 100 working days per year.
Source: Sapphos Environmental, Inc., CalEEMod output for the proposed project / proposed action; see Appendix C

As with the proposed project / proposed action, the purpose of Alternative 1 would be to reduce PM_{10} emissions through vegetation establishment. As evidenced by the results of the pilot study, Alternative 1 would result in improved air quality immediately following installation of the straw bales, specifically related to net reductions in PM_{10} emissions.

Sensitive Receptors

As with the proposed project / proposed action, Alternative 1 would not result in impacts to air quality as a result of exposure of sensitive receptors to substantial pollutant concentrations of carbon monoxide, toxic air contaminants, or visibility-reducing particles. As with implementation of the proposed project / proposed action, Alternative 1 would have a net benefit in relation to reduction of exposure of sensitive receptors in the communities of Keeler and Swansea to toxic air contaminants and visibility-reducing particles.

Odors

As with the proposed project / proposed action, Alternative 1 would not result in the creation of objectionable odors for substantial numbers of people. As with the proposed project / proposed action, Alternative 1 is located approximately 0.5 mile away from the nearest population, the community of Keeler. Construction emissions would be expected to be confined within ¼ mile of the construction site, and would be limited in duration due to the less than one year construction period and relatively low levels of equipment required.

B. CEQA Significance Determinations

Would the Alternative 1, Dust Control Measures Applied to 214 Acres Using Irrigation Water Delivered via Water Trucks / ATVs, have any of the following effects:

(1) Conflict with or obstruct implementation of the applicable air quality plan?

Alternative 1 would not have any impact related to conflicts with the applicable air quality plan, the 2008 SIP. Alternative 1 is designed to facilitate implementation of elements of the plan related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS.

(2) Violate any air quality standard or contribute substantially to existing or projected air violations?

Alternative 1 would not have any significant impact to air quality related to a violation of an air quality standard or contribution to an existing or projected air violation. Alternative 1 is designed to facilitate implementation of elements of the 2008 SIP related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS.

(3) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

Alternative 1 would not contribute to a cumulatively considerable net increase in any criteria pollutant for which the project region is non-attainment. The OVPA is non-attainment for PM_{10} emissions. Alternative 1 is designed to facilitate implementation of elements of the 2008 SIP related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS.

(4) Expose sensitive receptors to substantial pollutant concentrations?

Alternative 1 would result in less than significant impacts to air quality as a result of exposure of sensitive receptors to substantial pollutant concentrations of carbon monoxide, toxic air contaminants, or visibility-reducing particles. Implementation of Alternative 1 would have a net benefit in relation to reduction of exposure of sensitive receptors in the community of Keeler and the community of Swansea.

(5) Create objectionable odors affecting a substantial number of people?

Alternative 1 would result in less than significant impacts to air quality related to the creation of objectionable odors. Alternative 1 is located approximately 0.5 mile away from the nearest population, the community of Keeler. Construction emissions are expected to be confined within ¼ mile of the construction site, and be limited in duration due to the less than one year construction period and relatively low levels of equipment.

4.2.3.3 ALTERNATIVE 2, DUST CONTROL MEASURES APPLIED TO 197 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / ATVS

Alternative 2 has DCMs applied at different intensities in different areas of the Keeler Dunes, and the total acreage treated is 3 acres larger than the proposed project / proposed action (as described in Section 2.2.3) This alternative focuses on applying the highest intensity of dust control (95 percent control efficiency) across the Keeler Dunes and inter-dune sand sheet areas (170 acres), while applying less intensive controls on other inter-dune and sensitive cultural areas (27 acres at 90 percent dust control efficiency). The staging areas, access routes, construction scenario, and watering would remain the same as for the proposed project / proposed action; only the numbers of straw bales and plants and the area they are applied to would be increased by less than 1.5 percent due to the additional 3 acres to be treated. The construction scenario, access routes, staging areas and other design features would be largely the same as for the proposed project / proposed action although the area of impact would be 3 acres larger.

A. Direct and Indirect Impacts

Under Alternative 2, dust control measures including planting native vegetation and placing of straw bales as temporary wind breaks would be applied to a total of 197 acres of the emissive deposits in the dunes. The construction scenario, access routes, staging areas and other design features would be the same as for the proposed project / proposed action although the area of impact would be 3 acres larger.

Applicable Plans

As with the proposed project / proposed action, Alternative 2 would implement dust control measures at Keeler Dunes intended to demonstrate compliance with the 2008 SIP. As with the proposed project / proposed action, Alternative 2 is designed to facilitate implementation of elements of the plan related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS. Therefore, the air quality impacts of Alternative 1 would be the same as the proposed project / proposed action.

Air Quality Standards

As with the proposed project / proposed action, Alternative 2 would not violate an air quality standard or contribute to an existing or projected air violation. As with the proposed project / proposed action, Alternative 2 is designed to facilitate implementation of elements of the 2008 SIP related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS. Due to the fact that emissions of PM_{10} would be expected to be below the *de minimis* threshold and that the overall purpose of the project is to reduce PM_{10} emissions, the Alternative 2 would not be subject to a conformity determination (Table 4.2.3.3-1, *Conformity Determination for Alternative 2*).

TABLE 4.2.3.3-1
CONFORMITY DETERMINATION FOR ALTERNATIVE 2

Proposed Project / Proposed Action	Annual Unmitigated Estimated Nonattainment Air Pollutants (Tons/Year) PM_{10}
Construction	32.56
Operation	12.27
De Minimis Level	70
Subject to Conformity Determination?	No

Criteria Pollutants

Construction. As with the proposed project / proposed action, Alternative 2 generates *de minimis* levels of criteria pollutants from daily regional construction emissions (Table 4.2.3.3-2, *Unmitigated Estimated Daily Regional Construction Emissions for Alternative 2)*.

TABLE 4.2.3.3-2
UNMITIGATED ESTIMATED DAILY REGIONAL CONSTRUCTION EMISSIONS FOR ALTERNATIVE 2

Off-Road Emission Sources	Construction Emissions (Pounds/Day)					
	VOCs	**NOx**	**CO**	**SOx**	**$PM_{2.5}$**	**PM_{10}**
Site Preparation	8.98	102.12	45.57	0.09	4.23	5.64
Distribute straw bales on sand dunes	16.60	187.66	106.26	0.16	14.70	22.24
Planting and watering	56.67	660.60	328.34	0.65	35.46	48.12
Clean up and restoration	18.10	205.61	114.21	0.18	15.22	21.91
Maximum Off-road Emissions	**56.67**	**660.60**	**328.34**	**0.65**	35.46	48.12
Mobile Sources	**VOCs**	**NO_x**	**CO**	**SO_x**	**$PM_{2.5}$**	**PM_{10}**
Delivery trucks and employee commutes	0.25	0.31	3.62	0.00	41.97	420.41
Maximum Regional Total	**56.91**	**660.90**	**331.96**	**0.65**	**77.43**	**468.54**
Significant? *	NA	NA	NA	NA	NA	NA

Note: * The District does not have daily CEQA thresholds for criteria pollutants. US EPA annual *de minimis* thresholds were used to determine potential impacts.
NA: Not Applicable
Source: Sapphos Environmental, Inc., CalEEMod Output for the proposed project / proposed action

As with the proposed project / proposed action, Alternative 2 generates *de minimis* levels of criteria pollutants from annual regional construction emissions (Table 4.2.3.3-3, *Unmitigated Estimated Annual Regional Construction Emissions for Alternative 2)*.

TABLE 4.2.3.3-3
UNMITIGATED ESTIMATED ANNUAL REGIONAL CONSTRUCTION EMISSIONS FOR ALTERNATIVE 2

Emission Source	Air Pollutant Emissions (Tons/Year)					
	VOCs	**NO_x**	**CO**	**SO_x**	**$PM_{2.5}$**	**PM_{10}**
Maximum off-road construction emissions	0.00	0.01	0.14	0.00	1.52	15.25
Delivery trucks and employee commutes	2.27	26.42	13.13	0.03	1.42	1.93
Maximum Regional Total	**3.48**	**39.93**	**21.00**	**0.04**	**5.36**	**32.57**
US EPA *De Minimis* Thresholds (Tons/Year)*	50	100	NA	NA	NA	70
Significant?	No	No	NA	NA	NA	No

Note: * The District does not have CEQA thresholds for criteria pollutants. The US EPA *de minimis* thresholds have been used to determine potential impact.
NA: Not Applicable
Source: Sapphos Environmental, Inc., CalEEMod Output for the proposed project / proposed action

Operations and Maintenance. As with the proposed project / proposed action, the estimated daily operational emissions of PM_{10} for the monitoring phase of Alternative 2, including mobile-source emissions due to employee commute trips, would be below the U.S. EPA *de minimis* thresholds (Table 4.2.3.3-4, *Unmitigated Estimated Daily Operational Emissions for Alternative 2)*.

TABLE 4.2.3.3-4
UNMITIGATED ESTIMATED DAILY OPERATIONAL EMISSIONS
FOR ALTERNATIVE 2

Emission Sources	Air Pollutants (Pounds/Day)					
	VOCs	**NO_x**	**CO**	**SO_x**	**$PM_{2.5}$**	**PM_{10}**
Operational equipment	15.27	176.09	107.19	0.15	16.84	25.82
ATVs	0.07	0.03	0.39	0.00	2.22	22.21
Water Trucks	5.15	60.69	27.30	0.07	2.13	2.33
Total	**20.49**	**236.81**	**134.88**	**0.22**	**21.19**	**50.36**
Mobile Sources	0.03	0.01	0.18	0.00	1.01	10.10
Total Emissions	**20.52**	**236.82**	**135.06**	**0.22**	**22.20**	**60.46**
Significance?*	NA	NA	NA	NA	NA	NA

Note: * The District does not have CEQA thresholds for criteria pollutants. The US EPA *de minimis* Thresholds have been used to determine potential impact.
NA: Not Applicable
Source: Sapphos Environmental, Inc., CalEEMod output for the proposed project / proposed action

As with the proposed project / proposed action, the estimated annual operational emissions of PM_{10} for the monitoring phase of the Alternative 2, including mobile-source emissions due to employee commute trips, would be below the U.S. EPA *de minimis* thresholds (Table 4.2.3.3-5, *Unmitigated Estimated Annual Operational Emissions for Alternative 2*).

TABLE 4.2.3.2-5
UNMITIGATED ESTIMATED ANNUAL OPERATIONAL EMISSIONS
FOR ALTERNATIVE 2

Emission Sources	Air Pollutants (Tons/Year)					
	VOCs	**NO_x**	**CO**	**SO_x**	**$PM_{2.5}$**	**PM_{10}**
Operational equipment	1.99	22.98	13.99	0.02	4.79	8.14
ATVs	0.00	0.00	0.06	0.00	0.26	2.63
Water Trucks	0.67	7.92	3.56	0.00	0.28	0.31
Total	**2.66**	**30.90**	**17.61**	**0.02**	**5.33**	**11.08**
Mobile Sources	0.00	0.00	0.03	0.00	0.12	1.19
Total Emissions	**2.66**	**30.90**	**17.64**	**0.02**	**5.45**	**12.27**
US EPA *De Minimis* Threshold	50	100	NA	NA	NA	70
Exceedance of Significance?	No	No	NA	NA	NA	No

Notes: * The District does not have CEQA thresholds for criteria pollutants. The US EPA *de minimis* thresholds have been used to determine potential impact.
Annual operational equipment and mobile-source emissions are calculated assuming 100 working days per year.
Source: Sapphos Environmental, Inc., CalEEMod output for the proposed project / proposed action; see Appendix C

As with the proposed project / proposed action, the purpose of Alternative 2 would be to reduce PM_{10} emissions through vegetation establishment. As evidenced by the results of the pilot study, Alternative 2 would result in improved air quality immediately following installation of the straw bales, specifically related to net reductions in PM_{10} emissions.

Sensitive Receptors

As with the proposed project / proposed action, Alternative 2 would not result in impacts to air quality as a result of exposure of sensitive receptors to substantial pollutant concentrations of carbon monoxide, toxic air contaminants, or visibility-reducing particles. As with implementation of the proposed project / proposed action, Alternative 2 would have a net benefit in relation to reduction of exposure of sensitive receptors in the community of Keeler and the community of Swansea to toxic air contaminants and visibility-reducing particles.

Odors

As with the proposed project / proposed action, Alternative 2 would not result in the creation of objectionable odors for substantial numbers of people. As with the proposed project / proposed action, Alternative 2would be located approximately 0.5 mile away from the nearest population, the community of Keeler. Construction emissions would be expected to be confined within ¼ mile of the construction site, and would be limited in duration due to the less than one year construction period and relatively low levels of equipment required.

B. CEQA Significance Determinations

Would Alternative 2, Dust Control Measures Applied to 197 Acres Using Irrigation Water Delivered via Water Trucks / ATVs, have any of the following effects:

(1) Conflict with or obstruct implementation of the applicable air quality plan?

Alternative 2 would not have any impact related to conflicts with the applicable air quality plan, the 2008 SIP. Alternative 2 is designed to facilitate implementation of elements of the plan related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS.

(2) Violate any air quality standard or contribute substantially to existing or projected air violations?

Alternative 2 would not have any significant impact to air quality related to a violation of an air quality standard or contribution to an existing or projected air violation. Alternative 2 is designed to facilitate implementation of elements of the 2008 SIP related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS.

(3) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

Alternative 2 would not contribute to a cumulatively considerable net increase in any criteria pollutant for which the project region is non-attainment. The OVPA is non-attainment for PM_{10} emissions. Alternative 2 is designed to facilitate implementation of elements of the 2008 SIP related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS.

(4) Expose sensitive receptors to substantial pollutant concentrations?

Alternative 2 would result in less than significant impacts to air quality as a result of exposure of sensitive receptors to substantial pollutant concentrations of carbon monoxide, toxic air contaminants, or visibility-reducing particles. Implementation of Alternative 2 would have a net benefit in relation to reduction of exposure of sensitive receptors in the community of Keeler and the community of Swansea.

(5) Create objectionable odors affecting a substantial number of people?

Alternative 2 would result in less than significant impacts to air quality related to the creation of objectionable odors. Alternative 2 is located approximately 0.5 mile away from the nearest population, the community of Keeler. Construction emissions are expected to be confined within ¼ mile of the construction site, and be limited in duration due to the less than one year construction period and relatively low levels of equipment.

4.2.3.4 Alternative 3, Dust Control Measures Applied to 194 Acres Using Irrigation Water Delivered via Water Trucks / Tanks / PVC Irrigation System and Selected Manual Watering

Under Alternative 3, the DCMs would be the same as the proposed project / proposed action (as described in Section 2.2.4). Water obtained from the District's production well at the Fault Test site would be transported to the project via large water trucks to temporary storage tanks located at the three of the four designated staging areas. Since the staging areas are lower in elevation than the project area, each staging area would need to have a manifold and small electric booster pump to pressurize the irrigation system. Due to the minimal criteria pollutant emissions associated with a small electric booster pump, criteria pollutant emissions from the electric booster pump are assumed to be negligible. The use of water tanks mounted on ATVs, to irrigate plants would be replaced with a temporary aboveground irrigation system that would be installed within the 95 percent control level area to provide water to the project area. Plants within the sensitive 85 percent control area would be manually watered using the same method as described proposed project / proposed action. In the environmentally sensitive areas, the ATV mounted tanks would be filled with water from the delivery system within the project instead of from trucks at the staging areas.

A. Direct and Indirect Impacts

Due to the addition of an irrigation system, the air quality analysis for Alternative 3 includes an additional construction phase for the construction of the irrigation system. With the exception of the irrigation system, the construction scenario, access routes, staging areas and other design features would be largely the same as the proposed project / proposed action. Therefore, the air quality impacts would be the similar to the proposed project / proposed action.

Applicable Plans

As with the proposed action, Alternative 3 would implement dust control measures at Keeler Dunes intended to demonstrate compliance with the 2008 SIP. As with the proposed project / proposed action, Alternative 3 is designed to facilitate implementation of elements of the plan related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS. Therefore, the air quality impacts of Alternative 3 would be the same as the proposed project / proposed action.

Air Quality Standards

As with the proposed project / proposed action, Alternative 3 would not violate an air quality standard or contribute to an existing or projected air violation. As with the proposed project / proposed action, Alternative 3 is designed to facilitate implementation of elements of the 2008 SIP related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS. Due to the fact that emissions of PM_{10} would be expected to be below the *de minimis* threshold and that the overall purpose of the project is to reduce PM_{10} emissions, the Alternative 3 would not be subject to a conformity determination (Table 4.2.3.4-1, *Conformity Determination for Alternative 3*).

TABLE 4.2.3.4-1
CONFORMITY DETERMINATION FOR ALTERNATIVE 3

Proposed Project / Proposed Action	Annual Unmitigated Estimated Nonattainment Air Pollutants (Tons/Year) PM_{10}
Construction	32.66
Operation	10.09
De Minimis Level[1]	70
Subject to Conformity Determination?[2]	No

Criteria Pollutants

Construction. As with the proposed project / proposed action, Alternative 3 generates *de minimis* levels of criteria pollutants from daily regional construction emissions (Table 4.2.3.4-2, *Unmitigated Estimated Daily Regional Construction Emissions for Alternative 3)*.

TABLE 4.2.3.4-2
UNMITIGATED ESTIMATED DAILY REGIONAL CONSTRUCTION EMISSIONS FOR ALTERNATIVE 3

	Construction Emissions (Pounds/Day)					
Off-Road Emission Sources	**VOCs**	**NOx**	**CO**	**SOx**	**$PM_{2.5}$**	**PM_{10}**
Site Preparation	8.98	102.12	45.57	0.09	4.23	5.64
Distribute straw bales on sand dunes	16.60	187.66	106.26	0.16	14.69	22.21
Construction of irrigation system*	4.71	56.09	24.84	0.06	1.98	2.15
Planting and watering	56.67	660.60	328.34	0.65	35.46	48.09
Clean up and restoration	18.10	205.61	114.21	0.18	15.22	21.91
Maximum Off-road Emissions	**56.67**	**660.60**	**328.34**	**0.65**	**35.46**	**48.09**
Mobile Sources	**VOCs**	**NO_x**	**CO**	**SO_x**	**$PM_{2.5}$**	**PM_{10}**
Delivery trucks and employee commutes	0.25	0.31	3.62	0.00	41.97	420.41
Maximum Regional Total	**61.62**	**716.99**	**356.80**	**0.71**	**79.41**	**470.65**
Significant? **	NA	NA	NA	NA	NA	NA

Note: * Alternative 3 includes and additional off-road emission source for the construction of the irrigation system.
** The District does not have daily CEQA thresholds for criteria pollutants. US EPA annual *de minimis* thresholds were used to determine potential impacts.
NA: Not Applicable
Source: Sapphos Environmental, Inc., CalEEMod Output for the proposed project / proposed action

As with the proposed project / proposed action, Alternative 3 generates *de minimis* levels of criteria pollutants from annual regional construction emissions (Table 4.2.3.4-3, *Unmitigated Estimated Annual Regional Construction Emissions for Alternative 3)*.

TABLE 4.2.3.4-3
UNMITIGATED ESTIMATED ANNUAL REGIONAL CONSTRUCTION EMISSIONS FOR ALTERNATIVE 3

Emission Source	Air Pollutant Emissions (Tons/Year)					
	VOCs	NO_x	CO	SO_x	$PM_{2.5}$	PM_{10}
Maximum off-road construction emissions	0.00	0.01	0.14	0.00	1.52	15.25
Delivery trucks and employee commutes	2.27	26.42	13.13	0.03	1.42	1.92
Maximum Regional Total	**3.68**	**42.37**	**22.07**	**0.04**	**5.45**	**32.66**
US EPA *De Minimis* Thresholds (Tons/Year)*	50	100	NA	NA	NA	70
Significant?	No	No	NA	NA	NA	No

Note: * The District does not have CEQA thresholds for criteria pollutants. The US EPA *de minimis* thresholds have been used to determine potential impact.
NA: Not Applicable
Source: Sapphos Environmental, Inc., CalEEMod Output for the proposed project / proposed action

Operations and Maintenance. As with the proposed project / proposed action, the estimated daily operational emissions of PM_{10} for the monitoring phase of Alternative 3, including mobile-source emissions due to employee commute trips, would be below the U.S. EPA *de minimis* thresholds (Table 4.2.3.4-4, *Unmitigated Estimated Daily Operational Emissions for Alternative 3*).

TABLE 4.2.3.4-4
UNMITIGATED ESTIMATED DAILY OPERATIONAL EMISSIONS FOR ALTERNATIVE 3

Emission Sources	Air Pollutants (Pounds/Day)					
	VOCs	NO_x	CO	SO_x	$PM_{2.5}$	PM_{10}
Operational equipment	15.27	176.09	107.19	0.15	16.84	25.81
ATVs	0.00	0.00	0.05	0.00	0.30	3.03
Water Trucks	5.15	60.69	27.30	0.07	2.16	2.58
Total	**20.42**	**236.78**	**134.54**	**0.22**	**19.30**	**31.42**
Mobile Sources	0.03	0.01	0.18	0.00	1.01	10.10
Total Emissions	**20.45**	**236.79**	**134.72**	**0.22**	**20.31**	**41.52**
Significance?*	NA	NA	NA	NA	NA	NA

Note: * The District does not have CEQA thresholds for criteria pollutants. The US EPA *de minimis thresholds* have been used to determine potential impact.
NA: Not Applicable
Source: Sapphos Environmental, Inc., CalEEMod output for the proposed project / proposed action

As with the proposed project / proposed action, the estimated annual operational emissions of PM_{10} for the monitoring phase of the Alternative 3, including mobile-source emissions due to employee commute trips, would be below the U.S. EPA *de minimis* thresholds (Table 4.2.3.4-5, *Unmitigated Estimated Annual Operational Emissions for Alternative 3*).

TABLE 4.2.3.2-5
UNMITIGATED ESTIMATED ANNUAL OPERATIONAL EMISSIONS FOR ALTERNATIVE 3

Emission Sources	Air Pollutants (Tons/Year)					
	VOCs	**NO_x**	**CO**	**SO_x**	**$PM_{2.5}$**	**PM_{10}**
Operational equipment	1.99	22.98	13.99	0.02	4.79	8.14
ATVs	0.00	0.00	0.00	0.00	0.04	0.36
Water Trucks	0.67	7.92	3.56	0.00	0.29	0.40
Total	**2.66**	**30.90**	**17.55**	**0.02**	**5.12**	**8.90**
Mobile Sources	0.00	0.00	0.03	0.00	0.12	1.19
Total Emissions	**2.66**	**30.90**	**17.58**	**0.02**	**5.24**	**10.09**
US EPA *De Minimis* Threshold	50	100	NA	NA	NA	70
Exceedance of Significance?	No	No	NA	NA	NA	No

Notes: * The District does not have CEQA thresholds for criteria pollutants. The US EPA *de minimis* thresholds have been used to determine potential impact.
Annual operational equipment and mobile-source emissions are calculated assuming 100 working days per year.
Source: Sapphos Environmental, Inc., CalEEMod output for the proposed project / proposed action; see Appendix C

As with the proposed project / proposed action, the purpose of Alternative 3 would be to reduce PM_{10} emissions through vegetation establishment. As evidenced by the results of the pilot study, Alternative 3 would result in improved air quality immediately following installation of the straw bales, specifically related to net reductions in PM_{10} emissions.

Sensitive Receptors

As with the proposed project / proposed action, Alternative 3 would not result in impacts to air quality as a result of exposure of sensitive receptors to substantial pollutant concentrations of carbon monoxide, toxic air contaminants, or visibility-reducing particles. As with implementation of the proposed project / proposed action, Alternative 3 would have a net benefit in relation to reduction of exposure of sensitive receptors in the communities of Keeler and Swansea to toxic air contaminants and visibility-reducing particles.

Odors

As with the proposed project / proposed action, Alternative 3 would not result in the creation of objectionable odors for substantial numbers of people. As with the proposed project / proposed action, Alternative 3 is located approximately 0.5 mile away from the nearest population, the community of Keeler. Construction emissions would be expected to be confined within ¼ mile of the construction site, and would be limited in duration due to the less than one year construction period and relatively low levels of equipment required.

B. CEQA Significance Determinations

Would the Alternative 3, Dust Control Measures Applied to 194 Acres Using an Irrigation System, have any of the following effects:

(1) Conflict with or obstruct implementation of the applicable air quality plan?

Alternative 3 would not have any impact related to conflicts with the applicable air quality plan, the 2008 SIP. Alternative 3 is designed to facilitate implementation of elements of the plan related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS.

(2) Violate any air quality standard or contribute substantially to existing or projected air violations?

Alternative 3 would not have any significant impact to air quality related to a violation of an air quality standard or contribution to an existing or projected air violation. Alternative 3 is designed to facilitate implementation of elements of the 2008 SIP related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS.

(3) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

Alternative 3 would not contribute to a cumulatively considerable net increase in any criteria pollutant for which the project region is non-attainment. The OVPA is non-attainment for PM_{10} emissions. Alternative 3 is designed to facilitate implementation of elements of the 2008 SIP related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS.

(4) Expose sensitive receptors to substantial pollutant concentrations?

Alternative 3 would result in less than significant impacts to air quality as a result of exposure of sensitive receptors to substantial pollutant concentrations of carbon monoxide, toxic air contaminants, or visibility-reducing particles. Implementation of Alternative 3 would have a net benefit in relation to reduction of exposure of sensitive receptors in the community of Keeler and the community of Swansea.

(5) Create objectionable odors affecting a substantial number of people?

Alternative 3 would result in less than significant impacts to air quality related to the creation of objectionable odors. Alternative 3 is located approximately 0.5 mile away from the nearest population, the community of Keeler. Construction emissions are expected to be confined within ¼ mile of the construction site, and be limited in duration due to the less than one year construction period and relatively low levels of equipment

4.2.3.5 Alternative 4, Dust Control Measures Applied to 194 Acres Using Irrigation Water Delivered via Water Trucks / PVC Irrigation System and Selected Manual Watering

Under Alternative 4, the DCMs would be the same as the proposed project / proposed action (as described in Section 2.25). In Alternative 4, water obtained from the Fault Test Well would be transported to the project via water trucks and the water delivery system would be fed from three supply points along State Route 136. As with Alternative 3, plants within the 95 percent control area would be watered with hoses attached to the laterals of the temporary PVC irrigation system. In this alternative, water trucks would stage next to the highway and deliver water directly in to the temporary PVC irrigation system, rather than utilizing water tanks at the staging areas for temporary storage. As in Alternative 3, hand watering would be done in approximately 8 percent of the dust control area using hoses to deliver water from tanks mounted on ATVs, stage in a manner to avoid sensitive cultural resources. The ATV mounted tanks would be filled with water from the delivery system within the project instead of from tanks at the staging areas.

A. Direct and Indirect Impacts

Due to the addition of an irrigation system in Alternative 4, the air quality analysis for Alternative 4 includes an additional construction phase for the construction of the irrigation system. With the exception of the irrigation system, the construction scenario, access routes, staging areas and other design features would be largely the same as the proposed project / proposed action. Therefore, the air quality impacts would be the similar to the proposed project / proposed action.

Applicable Plans

As with the proposed action, Alternative 4 would implement dust control measures at Keeler Dunes intended to demonstrate compliance with the 2008 SIP. As with the proposed project / proposed action, Alternative 4 is designed to facilitate implementation of elements of the plan related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS. Therefore, the air quality impacts of Alternative 4 would be the same as the proposed project / proposed action.

Air Quality Standards

As with the proposed project / proposed action, Alternative 4 would not violate an air quality standard or contribute to an existing or projected air violation. As with the proposed project / proposed action, Alternative 4 has been designed to facilitate implementation of elements of the 2008 SIP related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS. Due to the fact that emissions of PM_{10} would be expected to be below the *de minimis* threshold and that the overall purpose of the project is to reduce PM_{10} emissions, the Alternative 4 would not be subject to a conformity determination (Table 4.2.3.5-1, *Conformity Determination for Alternative 4*).

TABLE 4.2.3.5-1
CONFORMITY DETERMINATION FOR ALTERNATIVE 4

Proposed Project / Proposed Action	Annual Unmitigated Estimated Nonattainment Air Pollutants (Tons/Year) PM_{10}
Construction	32.66
Operation	10.09
De Minimis Level[1]	70
Subject to Conformity Determination?[2]	No

Criteria Pollutants

Construction. As with the proposed project / proposed action, Alternative 4 generates *de minimis* levels of criteria pollutants from daily regional construction emissions (Table 4.2.3.5-2, *Unmitigated Estimated Daily Regional Construction Emissions for Alternative 4)*.

TABLE 4.2.3.5-2
UNMITIGATED ESTIMATED DAILY REGIONAL CONSTRUCTION EMISSIONS FOR ALTERNATIVE 4

Off-Road Emission Sources	Construction Emissions (Pounds/Day)					
	VOCs	**NOx**	**CO**	**SOx**	**$PM_{2.5}$**	**PM_{10}**
Site Preparation	8.98	102.12	45.57	0.09	4.23	5.64
Distribute straw bales on sand dunes	16.60	187.66	106.26	0.16	14.69	22.21
Construction of irrigation system*	4.71	56.09	24.84	0.06	1.98	2.15
Planting and watering	56.67	660.60	328.34	0.65	35.46	48.09
Clean up and restoration	18.10	205.61	114.21	0.18	15.22	21.91
Maximum Off-road Emissions	**56.67**	**660.60**	**328.34**	**0.65**	**35.46**	**48.09**
Mobile Sources	**VOCs**	**NO_x**	**CO**	**SO_x**	**$PM_{2.5}$**	**PM_{10}**
Delivery trucks and employee commutes	0.25	0.31	3.62	0.00	41.97	420.41
Maximum Regional Total	**61.62**	**716.99**	**356.80**	**0.71**	**79.41**	**470.65**
Significant? **	NA	NA	NA	NA	NA	NA

Note: * Alternative 4 includes and additional off-road emission source for the construction of the irrigation system.
** The District does not have daily CEQA thresholds for criteria pollutants. US EPA annual *de minimis* thresholds were used to determine potential impacts.
NA: Not Applicable
Source: Sapphos Environmental, Inc., CalEEMod Output for the proposed project / proposed action

As with the proposed project / proposed action, Alternative 4 generates *de minimis* levels of criteria pollutants from annual regional construction emissions (Table 4.2.3.5-3, *Unmitigated Estimated Annual Regional Construction Emissions for Alternative 4)*.

TABLE 4.2.3.5-3
UNMITIGATED ESTIMATED ANNUAL REGIONAL CONSTRUCTION EMISSIONS FOR ALTERNATIVE 4

Emission Source	Air Pollutant Emissions (Tons/Year)					
	VOCs	**NO_x**	**CO**	**SO_x**	**$PM_{2.5}$**	**PM_{10}**
Maximum off-road construction emissions	0.00	0.01	0.14	0.00	1.52	15.25
Delivery trucks and employee commutes	2.27	26.42	13.13	0.03	1.42	1.92
Maximum Regional Total	**3.68**	**42.37**	**22.07**	**0.04**	**5.45**	**32.66**
US EPA *De Minimis* Thresholds (Tons/Year)*	50	100	NA	NA	NA	70
Significant?	No	No	NA	NA	NA	No

Note: * The District does not have CEQA thresholds for criteria pollutants. The US EPA *de minimis* thresholds have been used to determine potential impact.
NA: Not Applicable
Source: Sapphos Environmental, Inc., CalEEMod Output for the proposed project / proposed action

Operations and Maintenance. As with the proposed project / proposed action, the estimated daily operational emissions of PM_{10} for the monitoring phase of Alternative 4, including mobile-source emissions due to employee commute trips, would be below the U.S. EPA *de minimis* thresholds (Table 4.2.3.5-4, *Unmitigated Estimated Daily Operational Emissions for Alternative 4*).

TABLE 4.2.3.5-4
UNMITIGATED ESTIMATED DAILY OPERATIONAL EMISSIONS
FOR ALTERNATIVE 4

Emission Sources	Air Pollutants (Pounds/Day)					
	VOCs	**NO_x**	**CO**	**SO_x**	**$PM_{2.5}$**	**PM_{10}**
Operational equipment	15.27	176.09	107.19	0.15	16.84	25.81
ATVs	0.00	0.00	0.05	0.00	0.30	3.03
Water Trucks	5.15	60.69	27.30	0.07	2.16	2.58
Total	**20.42**	**236.78**	**134.54**	**0.22**	**19.30**	**31.42**
Mobile Sources	0.03	0.01	0.18	0.00	1.01	10.10
Total Emissions	**20.45**	**236.79**	**134.72**	**0.22**	**20.31**	**41.52**
Significance?*	NA	NA	NA	NA	NA	NA

Note: * The District does not have CEQA thresholds for criteria pollutants. The US EPA *de minimis* thresholds have been used to determine potential impact.
NA: Not Applicable
Source: Sapphos Environmental, Inc., CalEEMod output for the proposed project / proposed action

As with the proposed project / proposed action, the estimated annual operational emissions of PM_{10} for the monitoring phase of the Alternative 4, including mobile-source emissions due to employee commute trips, would be below the U.S. EPA *de minimis* thresholds (Table 4.2.3.5-5, *Unmitigated Estimated Annual Operational Emissions for Alternative 4*).

TABLE 4.2.3.5-5
UNMITIGATED ESTIMATED ANNUAL OPERATIONAL EMISSIONS
FOR ALTERNATIVE 4

Emission Sources	Air Pollutants (Tons/Year)					
	VOCs	**NO_x**	**CO**	**SO_x**	**$PM_{2.5}$**	**PM_{10}**
Operational equipment	1.99	22.98	13.99	0.02	4.79	8.14
ATVs	0.00	0.00	0.00	0.00	0.04	0.36
Water Trucks	0.67	7.92	3.56	0.00	0.29	0.40
Total	**2.66**	**30.90**	**17.55**	**0.02**	**5.12**	**8.90**
Mobile Sources	0.00	0.00	0.03	0.00	0.12	1.19
Total Emissions	**2.66**	**30.90**	**17.58**	**0.02**	**5.24**	**10.09**
US EPA *De Minimis* Threshold	50	100	NA	NA	NA	70
Exceedance of Significance?	No	No	NA	NA	NA	No

Notes: * The District does not have CEQA thresholds for criteria pollutants. The US EPA *de minimis* thresholds have been used to determine potential impact.
Annual operational equipment and mobile-source emissions are calculated assuming 100 working days per year.
Source: Sapphos Environmental, Inc., CalEEMod output for the proposed project / proposed action; see Appendix C

As with the proposed project / proposed action, the purpose of Alternative 4 would be to reduce PM_{10} emissions through vegetation establishment. As evidenced by the results of the pilot study, Alternative 4 would result in improved air quality immediately following installation of the straw bales, specifically related to net reductions in PM_{10} emissions.

Sensitive Receptors

As with the proposed project / proposed action, Alternative 4 would not result in impacts to air quality as a result of exposure of sensitive receptors to substantial pollutant concentrations of carbon monoxide, toxic air contaminants, or visibility-reducing particles. As with implementation of the proposed project / proposed action, Alternative 4 would have a net benefit in relation to reduction of exposure of sensitive receptors in the communities of Keeler and Swanseato toxic air contaminants and visibility-reducing particles.

Odors

As with the proposed project / proposed action, Alternative 4 would not result in the creation of objectionable odors for substantial numbers of people. As with the proposed project / proposed action, Alternative 4 is located approximately 0.5 mile away from the nearest population, the community of Keeler. Construction emissions are expected to be confined within ¼ mile of the construction site, and be limited in duration due to the less than one year construction period and relatively low levels of equipment required.

B. CEQA Significance Determinations

Would the Alternative 4, Dust Control Measures Applied to 194 Acres Using a Combination of Hand Watering and an Irrigation System, have any of the following effects:

(1) Conflict with or obstruct implementation of the applicable air quality plan?

Alternative 4 would not have any impact related to conflicts with the applicable air quality plan, the 2008 SIP. Alternative 4 is designed to facilitate implementation of elements of the plan related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS.

(2) Violate any air quality standard or contribute substantially to existing or projected air violations?

Alternative 4 would not have any significant impact to air quality related to a violation of an air quality standard or contribution to an existing or projected air violation. Alternative 4 is designed to facilitate implementation of elements of the 2008 SIP related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS.

(3) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

Alternative 4 would not contribute to a cumulatively considerable net increase in any criteria pollutant for which the project region is non-attainment. The OVPA is non-attainment for PM_{10} emissions. Alternative 4 is designed to facilitate implementation of elements of the 2008 SIP related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS.

(4) Expose sensitive receptors to substantial pollutant concentrations?

Alternative 4 would result in less than significant impacts to air quality as a result of exposure of sensitive receptors to substantial pollutant concentrations of carbon monoxide, toxic air contaminants, or visibility-reducing particles. Implementation of Alternative 4 would have a net benefit in relation to reduction of exposure of sensitive receptors in the community of Keeler and the community of Swansea.

(5) Create objectionable odors affecting a substantial number of people?

Alternative 4 would result in less than significant impacts to air quality related to the creation of objectionable odors. Alternative 4 is located approximately 0.5 mile away from the nearest population, the community of Keeler. Construction emissions are expected to be confined within ¼ mile of the construction site, and be limited in duration due to the less than one year construction period and relatively low levels of equipment.

4.2.3.6 ALTERNATIVE 5, DUST CONTROL MEASURES APPLIED TO 194 ACRES USING IRRIGATION WATER DELIVERED VIA KCSD WATER WELL / PIPELINE TO IRRIGATION SYSTEM AND SELECTED MANUAL WATERING

Under Alternative 5, the DCMs would be the same as the proposed project / proposed action. In Alternative 5, water obtained from the KCSD well would be transported to the project via a temporary pipeline that connects into the KCSD water system near the KCSD well site. Water would be supplied directly to the temporary irrigation system from the KCSD, in lieu of the District's Fault Test well. As with Alternatives 3 and 4, Alternative 5 would include a temporary aboveground irrigation system installed within the 95 percent control level area to provide water to the project area. Plants within the sensitive 85 percent control area would be watered by hand using the same method as described above. The ATV mounted tanks would be filled with water from the delivery system within the project.

A. Direct and Indirect Impacts

Due to the addition of an irrigation system, the air quality analysis for Alternative 5 includes an additional construction phase for the construction of the irrigation system. Furthermore, since Alternative 5 involves a direct water line from the KCSD system, no water trucks are required for operations. Therefore, GHG emissions associated with water trucks were not included for the analysis of Alternative 5. As a result of the direct water line from the KCSD system, the air quality impacts is anticipated to be significantly less than the proposed project / proposed action.

Applicable Plans

As with the proposed action, Alternative 5 would implement dust control measures at Keeler Dunes intended to demonstrate compliance with the 2008 SIP. As with the proposed project / proposed action, Alternative 5 is designed to facilitate implementation of elements of the plan related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS. Therefore, the air quality impacts of Alternative 5 would be the same as the proposed project / proposed action.

Air Quality Standards

As with the proposed project / proposed action, Alternative 5 would not violate an air quality standard or contribute to an existing or projected air violation. As with the proposed project / proposed action, Alternative 5 is designed to facilitate implementation of elements of the 2008 SIP related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS. Due to the fact that emissions of PM_{10} are expected to be below the *de minimis* threshold and that the overall purpose of the project is to reduce PM_{10} emissions, the Alternative 5 is not subject to a conformity determination (Table 4.2.3.6-1, *Conformity Determination for Alternative 5*).

TABLE 4.2.3.6-1
CONFORMITY DETERMINATION FOR ALTERNATIVE 5

Proposed Project / Proposed Action	Annual Unmitigated Estimated Nonattainment Air Pollutants (Tons/Year)
	PM_{10}
Construction	32.66
Operation	9.69
De Minimis Level[1]	70
Subject to Conformity Determination?[2]	No

Criteria Pollutants

Construction. As with the proposed project / proposed action, Alternative 5 generates *de minimis* levels of criteria pollutants from daily regional construction emissions (Table 4.2.3.6-2, *Unmitigated Estimated Daily Regional Construction Emissions for Alternative 5)*.

TABLE 4.2.3.6-2
UNMITIGATED ESTIMATED DAILY REGIONAL CONSTRUCTION EMISSIONS FOR ALTERNATIVE 5

Off-Road Emission Sources	Construction Emissions (Pounds/Day)					
	VOCs	NO_x	CO	SO_x	$PM_{2.5}$	PM_{10}
Site Preparation	8.98	102.12	45.57	0.09	4.23	5.64
Distribute straw bales on sand dunes	16.60	187.66	106.26	0.16	14.69	22.21
Construction of irrigation system*	4.71	56.09	24.84	0.06	1.98	2.15
Planting and watering	56.67	660.60	328.34	0.65	35.46	48.09
Clean up and restoration	18.10	205.61	114.21	0.18	15.22	21.91
Maximum Off-road Emissions	**56.67**	**660.60**	**328.34**	**0.65**	**35.46**	**48.09**
Mobile Sources	**VOCs**	**NO_x**	**CO**	**SO_x**	**$PM_{2.5}$**	**PM_{10}**
Delivery trucks and employee commutes	0.25	0.31	3.62	0.00	41.97	420.41
Maximum Regional Total	**61.62**	**716.99**	**356.80**	**0.71**	**79.41**	**470.65**
Significant? **	NA	NA	NA	NA	NA	NA

Note: * Alternative 5 includes and additional off-road emission source for the construction of the irrigation system.
** The District does not have daily CEQA thresholds for criteria pollutants. US EPA annual *de minimis* thresholds were used to determine potential impacts.
NA: Not Applicable
Source: Sapphos Environmental, Inc., CalEEMod Output for the proposed project / proposed action

As with the proposed project / proposed action, Alternative 5 generates *de minimis* levels of criteria pollutants from annual regional construction emissions (Table 4.2.3.6-3, *Unmitigated Estimated Annual Regional Construction Emissions for Alternative 5)*.

TABLE 4.2.3.6-3
UNMITIGATED ESTIMATED ANNUAL REGIONAL CONSTRUCTION EMISSIONS FOR ALTERNATIVE 5

Emission Source	Air Pollutant Emissions (Tons/Year)					
	VOCs	**NO_x**	**CO**	**SO_x**	**$PM_{2.5}$**	**PM_{10}**
Maximum off-road construction emissions	0.00	0.01	0.14	0.00	1.52	15.25
Delivery trucks and employee commutes	2.27	26.42	13.13	0.03	1.42	1.92
Maximum Regional Total	**3.68**	**42.37**	**22.07**	**0.04**	**5.45**	**32.66**
US EPA *De Minimis* Thresholds (Tons/Year)*	50	100	NA	NA	NA	70
Significant?	No	No	NA	NA	NA	No

Note: * The District does not have CEQA thresholds for criteria pollutants. The US EPA *de minimis* thresholds have been used to determine potential impact.
NA: Not Applicable
Source: Sapphos Environmental, Inc., CalEEMod Output for the proposed project / proposed action

Operations and Maintenance. As with the proposed project / proposed action, the estimated daily operational emissions of PM_{10} for the monitoring phase of Alternative 5, including mobile-source emissions due to employee commute trips, would be below the U.S. EPA *de minimis* thresholds (Table 4.2.3.6-4, *Unmitigated Estimated Daily Operational Emissions for Alternative 5*).

TABLE 4.2.3.6-4
UNMITIGATED ESTIMATED DAILY OPERATIONAL EMISSIONS FOR ALTERNATIVE 5

Emission Sources	Air Pollutants (Pounds/Day)					
	VOCs	**NO_x**	**CO**	**SO_x**	**$PM_{2.5}$**	**PM_{10}**
Operational equipment	15.27	176.09	107.19	0.15	16.84	25.81
ATVs	0.00	0.00	0.05	0.00	0.30	3.03
Total	**15.27**	**176.09**	**107.24**	**0.15**	**17.14**	**28.84**
Mobile Sources	0.03	0.01	0.18	0.00	1.01	10.10
Total Emissions	**15.30**	**176.10**	**107.42**	**0.15**	**18.15**	**38.94**
Significance?*	NA	NA	NA	NA	NA	NA

Note: * The District does not have CEQA thresholds for criteria pollutants. The US EPA *de minimis* thresholds have been used to determine potential impact.
NA: Not Applicable
Source: Sapphos Environmental, Inc., CalEEMod output for the proposed project / proposed action

As with the proposed project / proposed action, the estimated annual operational emissions of PM_{10} for the monitoring phase of the Alternative 5, including mobile-source emissions due to employee commute trips, would be below the U.S. EPA *de minimis* thresholds (Table 4.2.3.6-5, *Unmitigated Estimated Annual Operational Emissions for Alternative 5*).

TABLE 4.2.3.6-5
UNMITIGATED ESTIMATED ANNUAL OPERATIONAL EMISSIONS
FOR ALTERNATIVE 5

Emission Sources	Air Pollutants (Tons/Year)					
	VOCs	**NO_x**	**CO**	**SO_x**	**$PM_{2.5}$**	**PM_{10}**
Operational equipment	1.99	22.98	13.99	0.02	4.79	8.14
ATVs	0.00	0.00	0.00	0.00	0.04	0.36
Total	**1.99**	**22.98**	**13.99**	**0.02**	**7.83**	**8.50**
Mobile Sources	0.00	0.00	0.03	0.00	0.12	1.19
Total Emissions	**1.99**	**22.98**	**14.02**	**0.02**	**7.95**	**9.69**
US EPA *De Minimis* Threshold	50	100	NA	NA	NA	70
Exceedance of Significance?	No	No	NA	NA	NA	No

Notes: * The District does not have CEQA thresholds for criteria pollutants. The US EPA *de minimis* thresholds have been used to determine potential impact.
Annual operational equipment and mobile-source emissions are calculated assuming 100 working days per year.
Source: Sapphos Environmental, Inc., CalEEMod output for the proposed project / proposed action; see Appendix C

As with the proposed project / proposed action, the purpose of Alternative 5 would be to reduce PM_{10} emissions through vegetation establishment. As evidenced by the results of the pilot study, Alternative 5 would result in improved air quality immediately following installation of the straw bales, specifically related to net reductions in PM_{10} emissions.

Sensitive Receptors

As with the proposed project / proposed action, Alternative 5 would not result in impacts to air quality as a result of exposure of sensitive receptors to substantial pollutant concentrations of carbon monoxide, toxic air contaminants, or visibility-reducing particles. As with implementation of the proposed project / proposed action, Alternative 5 would have a net benefit in relation to reduction of exposure of sensitive receptors in the communities of Keeler and Swanseato toxic air contaminants and visibility-reducing particles.

Odors

As with the proposed project / proposed action, Alternative 5 would not result in the creation of objectionable odors for substantial numbers of people. As with the proposed project / proposed action, Alternative 5 is located approximately 0.5 mile away from the nearest population, the community of Keeler. Construction emissions would be expected to be confined within ¼ mile of the construction site, and would be limited in duration due to the less than one year construction period and relatively low levels of equipment required.

B. CEQA Significance Determinations

Would the Alternative 5, Dust Control Measures Applied to 194 Acres Using Irrigation Water Delivered Via KCSD Water Well / Pipeline to Irrigation System and Selected Manual Watering, have any of the following effects:

(1) Conflict with or obstruct implementation of the applicable air quality plan?

Alternative 5 would not have any impact related to conflicts with the applicable air quality plan, the 2008 SIP. Alternative 5 is designed to facilitate implementation of elements of the plan related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS.

(2) Violate any air quality standard or contribute substantially to existing or projected air violations?

Alternative 5 would not have any significant impact to air quality related to a violation of an air quality standard or contribution to an existing or projected air violation. Alternative 5 is designed to facilitate implementation of elements of the 2008 SIP related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS.

(3) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

Alternative 5 would not contribute to a cumulatively considerable net increase in any criteria pollutant for which the project region is non-attainment. The OVPA is non-attainment for PM_{10} emissions. Alternative 5 is designed to facilitate implementation of elements of the 2008 SIP related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS.

(4) Expose sensitive receptors to substantial pollutant concentrations?

Alternative 5 would result in less than significant impacts to air quality as a result of exposure of sensitive receptors to substantial pollutant concentrations of carbon monoxide, toxic air contaminants, or visibility-reducing particles. Implementation of Alternative 5 would have a net benefit in relation to reduction of exposure of sensitive receptors in the community of Keeler and the community of Swansea.

(5) Create objectionable odors affecting a substantial number of people?

Alternative 5 would result in less than significant impacts to air quality related to the creation of objectionable odors. Alternative 5 is located approximately 0.5 mile away from the nearest population, the community of Keeler. Construction emissions would be expected to be confined within ¼ mile of the construction site, and would be limited in duration due to the less than one year construction period and relatively low levels of equipment

4.2.3.7 ALTERNATIVE 6, NO PROJECT / NO ACTION ALTERNATIVE

A. Direct and Indirect Impacts

Alternative 6, No Project / No Action, assumes that the dust control measures would not be implemented on the project site and windblown dust and associated PM_{10} emissions would continue to pose a health hazard to the residents of the communities of Keeler and Swansea. Under Alternative 6 it is likely that during certain wind events, the NAAQS and California state standards for PM_{10} would continue to be exceeded in violation of the 2008 SIP. The sand dunes on the project site would continue to migrate to the south-southeast toward the community of Keeler and natural resources within the dunes would continue to be affected by the shifting sands resulting from high wind events.

Applicable Plans

Alternative 6 conflicts with the 2008 SIP, in its failure to facilitate implementation of elements of the plan related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS.

Air Quality Standards

Alternative 6 conflicts with the 2008 SIP, in its failure to facilitate implementation of elements of the plan related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS.

Criteria Pollutants

Alternative 6 would contribute cumulatively considerable PM_{10} emissions in the OVPA, a criteria pollutant for which the project region is in non-attainment.

Unlike the proposed project / proposed action and project / action alternatives, the No Project / No Action Alternative would leave existing PM_{10} emissions in excess of the NAAQS unabated and the OVPA would be in violation of the Federal Clean Air Act.

Sensitive Receptors

In that Alternative 6 is the No Project / No Action scenario it would not create air quality impacts to sensitive receptors in the community of Keeler, the community of Swansea, the town of Lone Pine, and the Lone Pine Paiute-Shoshone Indian Reservation. However, it its failure to control dust emissions from the Keeler Dunes, it fail to achieve the net benefit in relation to reduction of exposure of sensitive receptors in the community of Keeler and the community of Swanseato toxic air contaminants and visibility-reducing particles that would result from the proposed project / proposed action and action alternatives.

Odors

Alternative 6 would not result in the creation of objectionable odors.

B. CEQA Significance Determinations

Would Alternative 6, No Project / No Action Alternative, have any of the following effects:

(1) Conflict with or obstruct implementation of the applicable air quality plan?

Alternative 6 would conflict with the applicable air quality plan, the 2008 SIP. Alternative 6 would result in continuation of the existing PM_{10} emissions from the Keeler Dunes that exceed the 24-hours standard specified by the NAAQS.

(2) Violate any air quality standard or contribute substantially to existing or projected air violations?

Alternative 6 would result in continued violation of the NAAQS 24-hour air quality standard for PM_{10} emissions from the Keeler Dunes. Alternative 6 would be inconsistent with the elements of the 2008 SIP related to control of PM_{10} emissions from the Keeler Dunes to meet the requirements of the NAAQS.

(3) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

Alternative 6 would contribute cumulatively considerable to PM_{10} emissions in the Owens Valley Planning area, a criteria pollutant for which the project region is in non-attainment.

(4) Expose sensitive receptors to substantial pollutant concentrations?

Alternative 6, which does not include an construction or operations and maintenance activities, would not result in impacts to air quality as a result of exposure of sensitive receptors to substantial pollutant concentrations of carbon monoxide, toxic air contaminants, or visibility-reducing particles. However, Alternative 6 fails to achieve the net benefits associated with the proposed project / proposed action and the action alternatives, in relation to reduction of exposure of sensitive receptors in the community of Keeler and the community of Swansea to toxic air contaminants and visibility-reducing particles.

(5) Create objectionable odors affecting a substantial number of people?

Alternative 6 would create objectionable odors, as there would be no action undertaken.

4.2.4 MITIGATION MEASURES

All construction projects in the District must comply with District Rules 400 and 401 for fugitive dust. Fugitive dust emissions shall be controlled and minimized to comply with Rules 400 and 401 through the application of best available control measures during all construction activities and areas associated with the proposed project / proposed action. Section 2.1.5.2, *Project Elements,* of the proposed project / proposed action description includes this requirement as part of the project plans and specifications. As a part of this requirement, ATVs would be restricted to a travel speed not to exceed 15 mph to minimize dust emissions during project implementation activities. Compliance with Rules 400 and 401 would reduce PM_{10} emissions from the construction phase of the proposed project / proposed action and reduce the NO_x emissions from construction equipment. As such, the implementation of the proposed project / proposed action would not be expected to result in significant impacts to air quality; therefore, mitigation measures would not be required. As such, the implementation of the proposed project / proposed action would not be expected to result in significant impacts to air quality; therefore, mitigation measures would not be required.

4.2.5 RESIDUAL IMPACTS AFTER MITIGATION

There would be no anticipated residual impacts to air quality.

4.3 BIOLOGICAL RESOURCES

4.3.1 CEQA SIGNIFICANCE CRITERIA / NEPA REQUIREMENTS

For purposes of the analysis, the CEQA Significance Determinations and NEPA Requirements are discussed concurrently where applicable (i.e. with regard to CEQA Guidelines criterion). For NEPA disclosure, the impact analysis is referring to the proposed project / proposed action or an alternative. Direct effects (or impacts) are those occurring in the same place and time as the proposed project / proposed action with regard to construction and maintenance. Direct natural resource impacts from the proposed project / proposed action or an alternative are related to disturbance or damage to sensitive habitats, wetlands and species during construction and maintenance. Indirect effects (or impacts) are those that could result from the proposed project / proposed action or an alternative, but are later in time (for example after construction, operations and maintenance, or decommissioning) or further removed in distance (for example, several miles from the proposed project / proposed action site).

4.3.1.1 CEQA SIGNIFICANCE CRITERIA

The significance criteria listed below were used to determine if the proposed project would cause any impacts associated to biological resources. These criteria are the same as the significance criteria for Biological Resources listed in the CEQA Environmental Checklist, Appendix G of the 2011 CEQA Guidelines. Under CEQA, the proposed project, dust control measures applied to 194 using irrigation water delivered via water trucks / ATVs; Alternative 1, dust control measures applied to 214 using irrigation water delivered via water trucks / ATVs; Alternative 2, dust control measures applied to 197 acres using irrigation water delivered via water trucks / ATVs; Alternative 3, dust control measures applied to 194 acres using irrigation water delivered via water trucks / tanks / PVC irrigation system and selected manual watering; Alternative 4, dust control measures applied to 194 acres using irrigation water delivered via water trucks / PVC irrigation system and selected manual watering; Alternative 5, dust control measures applied to 194 acres using irrigation water delivered via KCSD water well / pipeline to irrigation system and selected manual watering; and Alternative 6, No Project / No Action would experience a significant impact if the proposed project would:

(1) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife and U.S. Fish and Wildlife Service

(2) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service

(3) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filing, hydrological interruption, or other means

(4) Interfere substantially with the movement of any native resident or migratory fish and wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites

(5) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance

(6) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan

4.3.1.2 NEPA REQUIREMENTS

Specific requirements regarding biological resources such as adverse effects to federally threatened and endangered species and federally protected wetlands are encompassed in the CEQA criteria listed above. Therefore, for the purposes of the analysis, the CEQA Significance Determinations and NEPA Requirements are discussed concurrently where applicable (i.e. with regard to CEQA Guidelines criterion 1, 2 and 3).

4.3.2 ENVIRONMENTAL CONSEQUENCES

The following provides an analysis of the potential biological impacts associated with construction and maintenance of the proposed project / proposed action, Alternatives 1 through 5, and Alternative 6, No Project / No Action. Table 4.3.2-1, *Vegetation Community Impacts by Alternative*, summarizes the expected impacts to vegetation communities from the various project components. Permanent impacts are defined as those impacts that are long-term as opposed to temporary impacts which are defined as short-term. The following impact sections describe the anticipated impacts on lands associated with the proposed project / proposed action.

Table 4.3.2-1
Vegetation Community Impacts by Alternative (all units are in acres)

Project Component	Vegetation Community	Proposed Project / Proposed Action (194 acres) Water Truck / ATVs		Alternative 1 (214 acres) Water Trucks / ATVs		Alternative 2 (197 acres) Water Trucks / ATVs		Alternative 3 (194 acres) Water Trucks / Tanks PVC Irrigation System Selected Manual		Alternative 4 (194 acres) Water Trucks / Roadside PVC Irrigation System Selected Manual		Alternative 5 (194 acres) KCD Pipeline PVC Irrigation System Selected Manual		Alternative 6 No Project / No Action	
		Permanent Impacts (acres)	Temporary Impacts (acres)	Permanent Impacts (acres)	Temporary Impacts (acres)	Permanent Impacts (acres)	Temporary Impacts (acres)	Permanent Impacts (acres)	Temporary Impacts (acres)	Permanent Impacts (acres)	Temporary Impacts (acres)	Permanent Impacts (acres)	Temporary Impacts (acres)	Permanent Impacts (acres)	Temporary Impacts (acres)
Dust Control Measures (DCMs)	Parry's Saltbush	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Greasewood	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Parry's Saltbush and Greasewood	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Barren	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DCMs Total		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Staging Areas	Parry's Saltbush	0	2.4	0	2.4	0	2.4	0	2.4	0	2.4	0	2.4	0	0
	Greasewood	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Parry's Saltbush and Greasewood	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Barren	0	0.1	0	0.1	0	0.1	0	0.1	0	0.1	0	0.1	0	0
Staging Areas Total		0	2.5	0	2.5	0	2.5	0	2.5	0	2.5	0	2.5	0	0
Access routes	Parry's Saltbush	0	0.2	0	0.2	0	0.2	0	0.2	0	0.2	0	0.2	0	0
	Greasewood	0	0.1	0	0.1	0	0.1	0	0.1	0	0.1	0	0.1	0	0
	Parry's Saltbush and Greasewood	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Barren	0	2.3	0	2.3	0	2.3	0	2.3	0	2.3	0	2.3	0	0
Access Routes Total		0	2.6	0	2.6	0	2.6	0	2.6	0	2.6	0	2.6	0	0
Overall Totals	**Parry's Saltbush**	0	2.6	0	2.6	0	2.6	0	2.6	0	2.6	0	2.6	0	0
	Greasewood	0	0.1	0	0.1	0	0.1	0	0.1	0	0.1	0	0.1	0	0
	Parry's Saltbush and Greasewood	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Barren	0	2.4	0	2.4	0	2.4	0	2.4	0	2.4	0	2.4	0	0
Impact Totals		**0**	**5.1**	**0**	**5.1**	**0**	**5.1**	**0**	**5.1**	**0**	**5.1**	**0**	**5.1**	**0**	**0**

4.3.2.1 PROPOSED PROJECT / PROPOSED ACTION, DUST CONTROL MEASURES APPLIED TO 194 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / ATVS

The proposed project / proposed action consists of the implementation of dust control through establishment of native vegetation, on 194 acres of the Keeler Dunes. There are no permanent impacts and 3.2 acres of temporary impacts anticipated to result from construction activities associated with the proposed project / proposed action, which is characterized by barren sand dune and interdune spaces. Based on the results of the pilot study, planting of native vegetation is expected to achieve a minimum performance standard of 65 percent plant survival if irrigated during the three years following plant installation. Further details of the proposed project / proposed action are described in Section 2.

A. Direct and Indirect Impacts

Plant Communities

The proposed project / proposed action would result in no permanent impacts and approximately 5.1 acres of temporary impacts. Table 4.3.2-1 summarizes the expected temporary impacts to plant communities for the proposed project / proposed action. Temporary impacts include overland access.

Special Status Plant Species

Based on 2011–2013 botanical surveys conducted in accordance with CDFW protocol, the proposed project / proposed action would not be expected to result in impacts to biological resources in relation to plant species listed as candidate, proposed, threatened, or endangered pursuant to the federal ESA and California ESA (CESA), BLM sensitive plant species or priority plant species. Biological resource surveys conducted at the proposed project / proposed action study area did not identify any special status plant species on site or in adjacent areas, but did identify suitable habitat for four BLM sensitive plant species. The proposed project / proposed action would not adversely effect the habitat of special status plant species since the current habitat composition will remain intact. Therefore, there would be no expected impacts to special status plant species pursuant to the federal ESA, CESA, as designated as sensitive species by the BLM or CNPS.

Federally Listed Wildlife Species

The proposed project / proposed action would not be expected to result in impacts to biological resources in relation to species listed as rare, threatened, or endangered pursuant to the federal ESA. Biological resource surveys conducted at the proposed project / proposed action study area did not identify any rare, threatened, or endangered species and or potential habitat on site or in adjacent areas. Therefore, there would be no expected impacts to rare, threatened, or endangered species pursuant to the federal ESA

State-Listed Wildlife Species

The proposed project / proposed action would not be expected to result in impacts to biological resources in relation to species listed as rare, threatened, or endangered pursuant to CESA. Biological resource surveys conducted at the proposed project / proposed action study area did not identify any species designated as rare, threatened, or endangered pursuant to CESA, or potentially suitable habitat for all but one of these species. A small patch of marginally suitable habitat for the Mohave ground squirrel is located within the northern portion of the proposed project / proposed action study area north of Highway 136. However, proposed project / proposed action study area activities are limited to areas south of Highway 136. Therefore, there would be no expected impacts to rare, threatened, or endangered species pursuant to CESA.

BLM Sensitive Species

The proposed project / proposed action would not be expected to result in impacts to species designated as sensitive by the BLM. Biological resource surveys conducted at the proposed project / proposed action study area did not identify any sensitive speciesonsite. Suitable foraging habitat for golden eagle was observed within the proposed project / proposed action study area. However, there would be no expected impacts to golden eagle or other BLM sensitive species.

California Species of Special Concern

The proposed project / proposed action would not be expected to result in impacts to biological resources in relation to sensitive species designated as a species of special concern by the CDFW. Biological resource surveys conducted at the proposed project / proposed action study area did not identify any sensitive species or potential habitat on site or in adjacent areas. Therefore, there would be no expected impacts to sensitive species designated as a species of special concern by the CDFW.

Migratory Bird Species

The proposed project / proposed action would not be expected to result in impacts to biological resources in relation to migratory bird species as identified under the Migratory Bird Treaty Act. Biological resource surveys conducted at the proposed project / proposed action study area did identify migratory bird species as described under the Migratory Bird Treaty Act. Due to the low number of migratory birds observed and the nature of the proposed project / proposed action, there would be no expected impacts to migratory bird species.

Impacts to Locally Important Species

The proposed project / proposed action would not be expected to result in impacts to biological resources in relation to locally important species. As a result of biological resource surveys, one locally important species, the Owens dune weevil, was found to be present at the proposed project / proposed action study area.

Although not observed during biological surveys, the analysis assumed that the following locally important species are potentially present at the proposed project / proposed action study area due to previous observations or presence of suitable habitat: *Tescalsia gulianiata*, alkali flats tiger beetle (*Cicindela willistoni pseudosenilis*), alkali skipper (*Pseudocopaeodes eunus*), Owens Valley tiger beetle (*Cicindela tranquebarica inyo*), slender girdled tiger beetle (*Cicindla tenuicincta*), and Bell's sparrow (*Amphispiza belli canensis*). During travel within action staging areas and access routes, it is possible that individuals of these species may perish. However, the proposed project / proposed action would provide a long-term net benefit by providing a stable dune habitat environment and mixture of vegetative cover for a variety of wildlife species including those listed above and improving adverse ambient air quality conditions.

The following four locally important species were not observed during biological surveys nor is suitable habitat present, and are assumed to be absent from the proposed project / proposed action study area: Franklin's gull (*Larus pipixcan*), monarch butterfly (*Danaus plexippus*), Nuttall's woodpecker (*Picoides nuttallii*), and willet (*Tringa semipalmata*). Impacts to these species are not expected to occur due to project activities.

The goal of the proposed project / proposed action is to stabilize the dunes and establish native vegetation that would increase vegetation coverage for 194 acres that have been affected by migrating sand. In 1993, when the RMP was written, the Owens dune weevil had approximately 4,285 acres of suitable dune habitat. Based on the amount of habitat listed in the RMP, the proposed project / proposed action will occur on approximately 4.5 percent (194 acres) of the overall Owens dune weevil habitat (Figure 4.3.2.1-1, *Owens Dune Weevil Suitable Habitat within the Proposed Project / Proposed Action Area*). The BLM's RMP notes that *Atriplex polycarpa* and *Sarcobatus vermiculatus* are important species for dune stabilization. *Atriplex polycarpa* is the primary native species chosen for the proposed project / proposed action plan, in addition to other species on the RMP list (see Table 2.1.5.2-1, *Native Vegetation List)***,** and hence, is consistent with the RMP guidance.

The BLM has recommendations in place to ensure sufficient habitat and microclimate conditions for the Owens dune weevil. These recommendations can be found in the RMP and contains two goals for the Owens dune weevil:

1. Maintain and enhance habitat for Owens dune weevil.

2. Meet desired plant community (DPC) goals on 3,214 acres (75 percent) of dune habitat to maintain habitat for the Owens dune weevil.

With regards to conserving Owens dune weevil habitat, the DPC goals found in the RMP specifies the "retention of present vegetative cover which varies from scant cover of widely scattered shrubs and herbs to nearly closed shrub canopies."[1] This helps maintain diversity of the overall dune habitat. The DPC goals also seek to "Maintain the current overall vegetative cover of approximately 7 percent in the dune habitat."

The percentage of vegetative cover required for 85 percent and 95 percent dust control is between 7 percent and 12 percent, respectively. The existing cover is estimated at 3 percent to 6 percent (see Appendix D, Biological Resources Technical Report). Although the 194 acres of dust control is anticipated to exceed 7 percent vegetative cover for the proposed project / proposed action area, the percent cover for the overall study area will not significantly change. The overall coverage for the proposed project / proposed action study area located west of SR 136 would range from 3 to 12 percent with fully implemented dust controls. Existing barren and sparsely vegetated areas will remain for the Owens dune weevil in the surrounding areas to the north, east, and southeast, providing a mixture of cover as expressed in the RMP. Based on best prevailing science, it is unclear whether or not the Owens dune weevil will survive in areas with greater than 7 percent vegetative cover. The project may have an unknown effect on Owens dune weevil habitat within the project area. However, the project area constitutes a small proportion (approximately 4.5 percent) of the Owens dune weevil's overall available habitat. The project goal of establishing a maximum 12 percent vegetative cover in 4.5 percent of available habitat does not conflict with the BLM Bishop RMP goals for the Owens Dune Weevil. Although up to 194 acres is anticipated to exceed 7 percent vegetative cover for the proposed

[1] U.S. Department of the Interior, Bureau of Land Management, Bakersfield District. April 1993. *Bishop Resource Management Plan Record of Decision:* Appendix 1, *Desired Plant Community Definitions*. Bakersfield, CA.

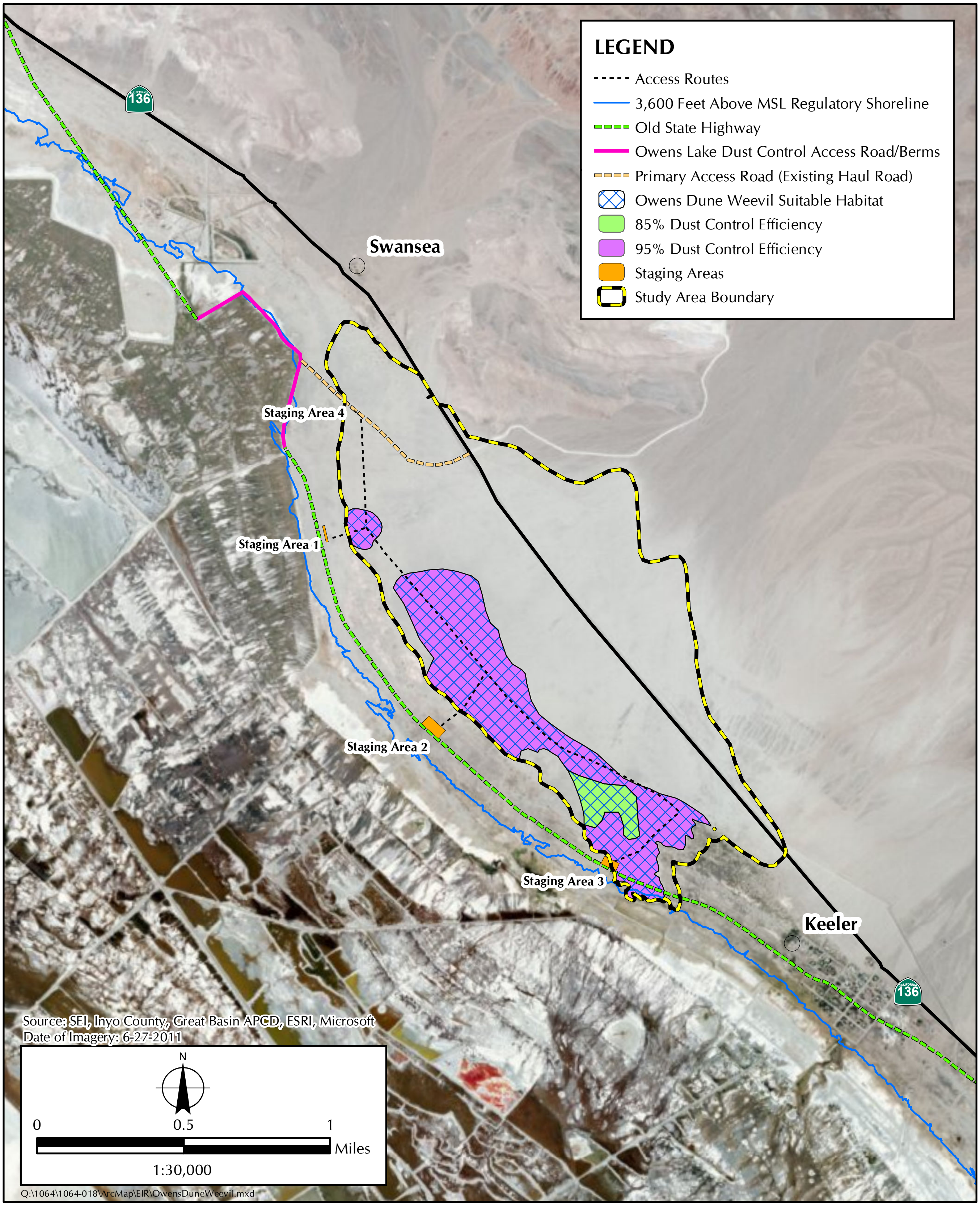

FIGURE 4.3.2.1-1

Owens Dune Weevil Suitable Habitat
within the Proposed Project / Proposed Action Area

project / proposed action area, the RMP goal of maintaining 7 percent cover on 75 percent (3,214 acres) of available habitat will be met. In line with the RMP, the proposed project / proposed action area will contain a range of cover including some areas with greater canopy closure.

During site preparation activities for project staging areas and access routes, it is possible that individuals of this species may perish. This is not expected to measurably affect the species at a population level.

State-Designated Sensitive Habitats

The proposed project / proposed action would not be expected to result in impacts to State-designated sensitive habitats. Biological resource surveys conducted at the proposed project / proposed action study area did not identify any state-designated sensitive habitats on site or in immediately adjacent areas. Therefore, there would be no expected impacts to state-designated sensitive habitats.

Affected Waters and Riparian Habitat

The proposed project / proposed action would not be expected to result in impacts to federally protected wetlands pursuant to Section 404 of the Clean Water Act. Biological resources surveys conducted at the proposed project / proposed action study area identified one federally listed wetland on site according to the NWI. Based on the vantage point of the surveyors, no apparent wetland features were identified where the NWI record exists. Also, the District has indicated that this area was a former wetland and that it has been covered by sand migration. Therefore, there would be no expected impacts to federally protected wetlands pursuant to Section 404 of the Clean Water Act.

There are two ephemeral drainages within the proposed study area that are subject to the jurisdiction of the CDFW, pursuant to Section 1600 State Fish and Game Code. The proposed project / proposed action has been designed in the terrestrial upland areas outside the drainages. Therefore, there would be no impacts to Waters of the State.

Wildlife Movement and Nursery Sites

The proposed project / proposed action would not be expected to result in impacts to known migratory routes or nursery sites. Biological resources surveys conducted at the proposed project / proposed action study area did not identify any migratory corridors or nursery sites on site or in adjacent areas. Therefore, there would be no expected impacts to migratory routes or nursery sites.

Wildlife movement corridors are considered sensitive by resource and conservation agencies. No fencing or other obstruction will not be erected during project activities, allowing small, medium and large mammals and reptiles to move freely through the site. Thus, there is no anticipated impact to wildlife movement or nursery sites, and no additional mitigation would be required.

B. CEQA SIGNIFICANCE DETERMINATIONS

Would the proposed project:

(1) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans,

policies, or regulations, or by the California Department of Fish and Wildlife and U.S. Fish and Wildlife Service?

The proposed project would not adversely affect special federal and/or state listed species, as well as BLM sensitive wildlife species. With implementation of the proposed project, the impact to special status species is less than significant impact pursuant to CEQA.

(2) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

The proposed project does not potentially affect riparian habitat or sensitive natural communities. With the implementation of the proposed project, the impact to sensitive native plant communities is less than significant impact pursuant to CEQA.

(3) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

The preliminary estimated impacts to USACOE jurisdictional waters are not expected to exceed 0.06 acre of fill to manmade systems and 0.01 acre of impacts to jurisdictional habitat on BLM managed lands. The proposed project would not be expected to result in impacts to federally protected wetlands pursuant to Section 404 of the Clean Water Act. Biological resources surveys conducted at the proposed project study area identified one federally listed wetland on-site according to the NWI. However, no apparent wetland features were identified where the NWI record exists. Also, the District has indicated that this area was a former wetland and that it has been covered by sand migration. Therefore, there would be no expected impacts to federally protected wetlands pursuant to Section 404 of the Clean Water Act. With the implementation of the proposed project, there would be no impact to wetlands pursuant to CEQA.

(4) Interfere substantially with the movement of any native resident or migratory fish and wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

The proposed project would not inhibit the movement of wildlife in and around the area. No fencing or other terrestrial obstruction would be installed in this area. Small, medium and large-sized wildlife would not be inhibited from moving through the proposed project site. With implementation of the proposed project, there would be no impact to wildlife movement pursuant to CEQA.

(5) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

The proposed project would not conflict with local policies and ordinances. A review of the Bishop Resource Management Plan, Inyo County General Plan, and Lower Owens River Project Plan did not identify any conflicts resulting from the proposed project. Implementation of the proposed project would not conflict with local policies and ordinances; therefore, there would be no impact pursuant to CEQA.

(6) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

The proposed project would not conflict with an adopted HCP or NCCP, or other approved state, local, or regional plan. The proposed project study area is not located within the boundaries of an HCP area, NCCP area, or any other planning area designated by any local, regional, or state agency. Therefore, there would be no expected impacts regarding conflict with the provisions of an adopted HCP and/or NCP pursuant to CEQA.

4.3.2.2 ALTERNATIVE 1, DUST CONTROL MEASURES APPLIED TO 214 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / ATVS

Under Alternative 1, construction would be essentially the same as for the proposed project / proposed action (as described in Section 2.2.2). The primary difference between the alternatives would be the total number of plants and straw bales that would be transported to the project site and distributed onto a larger area (20 additional acres) of dust control. Alternative 1 would result in a greater number of plants and straw bales; hence, additional workers and equipment may be necessary to complete the alternative in the same time frame as the proposed project / proposed action. As with the proposed project / proposed action, supplemental irrigation in the first 3 years following installation of native vegetation would be completed via hauling of water in small water tanks (about 150–200 gallons) mounted on a trailer and pulled with an ATV and then irrigation would be conducted by hand through a small diameter hose.

A. Direct and Indirect Impacts

The biological resources potentially affected by Alternative 1 are the same as those that would be potentially impacted by the proposed project / proposed action. There are no permanent impacts; 5.1 acres of temporary impacts would be anticipated to result from construction activities associated with Alternative 1, which is characterized by barren sand dune and interdune spaces. Based on the results of the pilot study, restoration of native vegetation is expected to achieve a minimum performance standard of 65 percent plant survival if irrigated during the 3 years following plant installation. Impacts to special status plant species would not be expected to occur during implementation of Alternative 1.

Alternative 1 would not be expected to result in potential impacts to federal and state listed wildlife species, BLM sensitive species, or California species of special concern.

Potential impacts to locally important species include: minor potential direct and indirect impacts to Owens dune weevil, as described for the proposed project / proposed action: direct mortality to some individuals during site preparation activities for areas along access routes and minor alteration of a small proportion of the species' overall habitat.

Potential impacts to state-designated sensitive habitats are not expected to occur as none were identified on-site or in immediately adjacent areas.

Potential impacts to waters and riparian habitat are not expected to occur as none were identified on-site or in immediately adjacent areas.

Potential impacts to wildlife movement and nursery sites are not expected to occur as none were identified on-site or in immediately adjacent areas.

Potential impacts to resources under this alternative are in conformance with the CDCA and maintain the integrity and intent of the Conservation Plan.

B. CEQA Significance Determinations

Would Alternative 1:

(1) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife and U.S. Fish and Wildlife Service?

Like the proposed project, this alternative could not adversely affect special federal and/or state listed species, as well as BLM sensitive wildlife species. With implementation of Alternative 1, the impact to special status species is considered a less than significant impact pursuant to CEQA.

(2) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Like the proposed project, this alternative would not affect riparian habitat or sensitive natural communities. With the implementation of Alternative 1, there would be no impact to sensitive native plant communities pursuant to CEQA.

(3) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Like the proposed project, there would be no impact federal and state protected wetlands/waters for this alternative. With the implementation of Alternative 1, there would be no impact to wetlands pursuant to CEQA.

(4) Interfere substantially with the movement of any native resident or migratory fish and wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Like the proposed project, this alternative would not inhibit the movement of wildlife in and around the area. No fencing or other terrestrial obstruction would be installed in this area. Small, medium, and large-sized wildlife would not be inhibited from moving through the proposed project site. With the implementation of Alternative 1, there would be no impact to wildlife movement pursuant to CEQA.

(5) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Like the proposed project, this alternative would not conflict with local policies and ordinances. A review of the Bishop Resource Management Plan, Inyo County General Plan, and Lower Owens River Project Plan did not identify any conflicts resulting from the proposed project. Therefore, there would be no impact pursuant to CEQA.

(6) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

Like the proposed project, Alternative 1 would not conflict with an adopted HCP or NCCP, or other approved state, local, or regional plan. The proposed project study area is not located within the boundaries of an HCP area, NCCP area, or any other planning area designated by any local, regional, or state agency. Therefore, there would be no expected impacts regarding conflict with the provisions of an adopted HCP and/or NCP pursuant to CEQA.

4.3.2.3 ALTERNATIVE 2, DUST CONTROL MEASURES APPLIED TO 197 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / ATVS

Alternative 2 has DCMs applied at different intensities in different areas of the Keeler Dunes, and the total acreage treated is 3 acres larger than the proposed project / proposed action (as described in Section 2.2.3) This alternative focuses on applying the highest intensity of dust control (95 percent control efficiency) across the Keeler Dunes and inter-dune sand sheet areas (170 acres), while applying less intensive controls on other inter-dune and sensitive cultural areas (27 acres at 90 percent dust control efficiency). The staging areas, access routes, construction scenario, and watering would remain the same as for the proposed project / proposed action; only the numbers of straw bales and plants and the area they are applied to would be increased by less than 3 percent due to the additional 3 acres to be treated. The construction scenario, access routes, staging areas and other design features would be largely the same as for the proposed project / proposed action although the area of impact would be 3 acres larger.

A. Direct and Indirect Impacts

The biological resources potentially affected by Alternative 2 are the same as those that would be potentially impacted by the proposed project / proposed action. There are no permanent impacts; 5.1 acres of temporary impacts would be anticipated to result from construction activities associated with Alternative 2, which is characterized by barren sand dune and interdune spaces. Based on the results of the pilot study, restoration of native vegetation is expected to achieve a minimum performance standard of 65 percent plant survival if irrigated during the 3 years following plant installation. Impacts to special status plant species would not be expected to occur during implementation of Alternative 2.

Alternative 2 would not be expected to result in potential impacts to federal and state listed wildlife species, BLM sensitive species, or California species of special concern.

Potential impacts to locally important species include minor potential direct and indirect impacts to Owens dune weevil, as described for the proposed project / proposed action: direct mortality to some individuals during grading activities for staging areas and access routes, and minor alteration of a small proportion of the species' overall habitat.

Potential impacts to state-designated sensitive habitats are not expected to occur as none were identified on-site or in immediately adjacent areas.

Potential impacts to waters and riparian habitat are not expected to occur as none were identified on-site or in immediately adjacent areas.

Potential impacts to wildlife movement and nursery sites are not expected to occur as none were identified on-site or in immediately adjacent areas.

Potential impacts to resources under this alternative are in conformance with the CDCA and maintain the integrity and intent of the Conservation Plan.

B. CEQA Significance Determinations

Would Alternative 2:

(1) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife and U.S. Fish and Wildlife Service?

Like the proposed project, this alternative could not adversely affect special federal and/or state listed species, as well as BLM sensitive wildlife species. With implementation of Alternative 2, the impact to special status species is considered a less than significant impact pursuant to CEQA.

(2) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Like the proposed project, this alternative would not affect riparian habitat or sensitive natural communities. With the implementation of Alternative 2, there would be no impact to sensitive native plant communities pursuant to CEQA.

(3) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Like the proposed project, this alternative would not impact federal and state protected wetlands/waters. With the implementation of Alternative 2, there would be no impact to wetlands pursuant to CEQA.

(4) Interfere substantially with the movement of any native resident or migratory fish and wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Like the proposed project, this alternative would not inhibit the movement of wildlife in and around the area. No fencing or other terrestrial obstruction would be installed in this area. Small, medium, and large-sized wildlife would not be inhibited from moving through the proposed project site. With the implementation of Alternative 2, there would be no impact to wildlife movement pursuant to CEQA.

(5) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Like the proposed project, Alternative 2 would not conflict with local policies and ordinances. A review of the Bishop Resource Management Plan, Inyo County General Plan, and Lower Owens River

Project Plan did not identify any conflicts resulting from the proposed project. Therefore, there would be no impact pursuant to CEQA.

(6) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

Like the proposed project, this alternative would not conflict with an adopted HCP or NCCP, or other approved state, local, or regional plan. The proposed project study area is not located within the boundaries of an HCP area, NCCP area, or any other planning area designated by any local, regional, or state agency. Therefore, there would be no impacts pursuant to CEQA.

4.3.2.4 Alternative 3, Dust Control Measures Applied to 194 Acres Using Irrigation Water Delivered via Water Trucks / Tanks / PVC Irrigation System and Selected Manual Watering

Under Alternative 3, the DCMs would be the same as the proposed project / proposed action (as described in Section 2.2.4). Water obtained from the District's production well at the Fault Test site would be transported to the project via large water trucks to temporary storage tanks located at the three of the four designated staging areas. Since the staging areas are lower in elevation than the project area, each staging area would need to have a manifold and booster pump to pressurize the irrigation system. The use of water tanks mounted on ATVs, to distribute supplemental irrigation during the operations and maintenance phase of the project, would be replaced with a temporary aboveground irrigation system that would be installed within the 95 percent control level area to provide water to the project area. Plants within the sensitive 85 percent control area would be manually watered using the same method as described proposed project/proposed action. In the environmentally sensitive areas, the ATV mounted tanks would be filled with water from the delivery system within the project instead of from trucks at the staging areas. At locations where the access route crosses irrigation lines, temporary protective covers would be placed over the piping to allow travel over the system and prevent damage to the irrigation system. There would be approximately 124 total crossings of the irrigation lines (with 62 crossings of the 2-inch distribution laterals and 62 crossings of the 4-inch transmission line). Following the completion of each irrigation event the irrigation system would be drained of water. Approximately 200 gallons of water will be drained from each lateral in a manner to prevent flows off of the proposed project / proposed action area.

A. Direct and Indirect Impacts

The biological resources potentially affected by Alternative 3 are the same as those that would be potentially impacted by the proposed project / proposed action. There are no permanent impacts; 5.1 acres of temporary impacts would be anticipated to result from construction activities associated with Alternative 2, which is characterized by barren sand dune and interdune spaces. Based on the results of the pilot study, restoration of native vegetation is expected to achieve a minimum performance standard of 65 percent plant survival if irrigated during the 3 years following plant installation. There is the potential that noise from the diesel pumps used for irrigation could cause wildlife to avoid the immediate area around the pumps. However, they are not anticipated to have impacts on wildlife utilization of the proposed project / proposed action study area due to their infrequent use and dispersed locations. Impacts to special status plant species would not be expected to occur during implementation of Alternative 3.

Alternative 3 would not be expected to result in potential impacts to federal and state listed wildlife species, BLM sensitive species, or California species of special concern.

Potential impacts to locally important species include minor potential direct and indirect impacts to Owens dune weevil, as described for the proposed project / proposed action: direct mortality to some individuals during grading activities for staging areas and access routes, and minor alteration of a small proportion of the species' overall habitat.

Potential impacts to state-designated sensitive habitats are not expected to occur as none were identified on-site or in immediately adjacent areas.

Potential impacts to waters and riparian habitat are not expected to occur as none were identified on-site or in immediately adjacent areas.

Potential impacts to wildlife movement and nursery sites are not expected to occur as none were identified on-site or in immediately adjacent areas.

Potential impacts to resources under this alternative are in conformance with the CDCA and maintain the integrity and intent of the Conservation Plan.

B. CEQA Significance Determinations

Would Alternative 3:

(1) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife and U.S. Fish and Wildlife Service?

Like the proposed project, this alternative could not adversely affect special federal and/or state listed species, as well as BLM sensitive wildlife species. With implementation of Alternative 3, the impact to special status species is considered a less than significant impact pursuant to CEQA.

(2) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Like the proposed project, this alternative would not affect riparian habitat or sensitive natural communities. With the implementation of Alternative 3, there would be no impact to sensitive native plant communities pursuant to CEQA.

(3) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Like the proposed project, this alternative would not impact federal and state protected wetlands/waters. With the implementation of Alternative 3, there would be no impact to wetlands pursuant to CEQA.

(4) Interfere substantially with the movement of any native resident or migratory fish and wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Like the proposed project, this alternative would not inhibit the movement of wildlife in and around the area. No fencing or other terrestrial obstruction would be installed in this area. Small, medium, and large-sized wildlife would not be inhibited from moving through the proposed project site. With the implementation of Alternative 3, there would be no impact to wildlife movement pursuant to CEQA.

(5) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Like the proposed project, Alternative 3 would not conflict with local policies and ordinances. A review of the Bishop Resource Management Plan, Inyo County General Plan, and Lower Owens River Project Plan did not identify any conflicts resulting from the proposed project. Therefore, there would be no impact pursuant to CEQA.

(6) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

Like the proposed project, this alternative would not conflict with an adopted HCP or NCCP, or other approved state, local, or regional plan. The proposed project study area is not located within the boundaries of an HCP area, NCCP area, or any other planning area designated by any local, regional, or state agency. Therefore, there would be no impacts pursuant to CEQA.

4.3.2.5 Alternative 4, Dust Control Measures Applied to 194 Acres Using Irrigation Water Delivered via Water Trucks / PVC Irrigation System and Selected Manual Watering

Under Alternative 4, the DCMs would be the same as the proposed project / proposed action (as described in Section 2.25). In Alternative 4, water obtained from the Fault Test Well would be transported to the project via water trucks and the water delivery system would be fed from three supply points along State Route 136. As with Alternative 3, plants within the 95 percent control area would be watered with hoses attached to the laterals of the temporary PVC irrigation system. In this alternative, water trucks would stage next to the highway and deliver water directly in to the temporary PVC irrigation system, rather than utilizing water tanks at the staging areas for temporary storage. As in Alternative 3, hand watering would be done in approximately 8 percent of the dust control area using hoses to deliver water from tanks mounted on ATVs, stage in a manner to avoid sensitive resources. As with the temporary irrigation system, the ATV mounted tanks would be filled with water from the delivery system within the project instead of from tanks at the staging areas. At locations where the access route crosses irrigation lines, temporary protective covers would be placed over the piping to allow travel over the system and prevent damage to the irrigation system. There would be approximately 124 total crossings of the irrigation lines (with 62 crossings of the 2-inch distribution laterals and 62 crossings of the 4-inch transmission line). Following the completion of each irrigation event the irrigation system would be drained of water. Approximately 200 gallons of water will be drained from each lateral in a manner to prevent flows off of the project area.

A. Direct and Indirect Impacts

The biological resources potentially affected by Alternative 4 are the same as those that would be potentially impacted by the proposed project / proposed action. Construction activities associated with There are no permanent impacts; 5.1 acres of temporary impacts would be anticipated to result from construction activities associated with Alternative 4, which is characterized by barren sand dune, interdune spaces, and highway shoulder areas. Based on the results of the pilot study, restoration of native vegetation is expected to achieve a minimum performance standard of 65 percent plant survival if irrigated during the 3 years following plant installation. There is the potential that noise from the diesel pumps used for irrigation could cause wildlife to avoid the immediate area around the pumps. However, they are not anticipated to have impacts on wildlife utilization of the proposed project / proposed action study area due to their infrequent use and dispersed locations. Impacts to special status plant species would not be expected to occur during implementation of Alternative 4.

Alternative 4 would not be expected to result in potential impacts to federal and state listed wildlife species, BLM sensitive species, or California species of special concern.

Potential impacts to locally important species include minor potential direct and indirect impacts to Owens dune weevil, as described for the proposed project / proposed action: direct mortality to some individuals during grading activities for staging areas and access routes, and minor alteration of a small proportion of the species' overall habitat.

Potential impacts to state-designated sensitive habitats are not expected to occur as none were identified on-site or in immediately adjacent areas.

Potential impacts to waters and riparian habitat are not expected to occur as none were identified on-site or in immediately adjacent areas.

Potential impacts to wildlife movement and nursery sites are not expected to occur as none were identified on-site or in immediately adjacent areas.

Potential impacts to resources under this alternative are in conformance with the CDCA and maintain the integrity and intent of the Conservation Plan.

B. CEQA Significance Determinations

Would Alternative 4:

(1) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife and U.S. Fish and Wildlife Service?

Like the proposed project, this alternative could not adversely affect special federal and/or state listed species, as well as BLM sensitive wildlife species. With implementation of Alternative 4, the impact to special status species is considered a less than significant impact pursuant to CEQA.

(2) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Like the proposed project, this alternative would not affect riparian habitat or sensitive natural communities. With the implementation of Alternative 4, there would be no impact to sensitive native plant communities pursuant to CEQA.

(3) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Like the proposed project, this alternative would not impact federal and state protected wetlands/waters. With the implementation of Alternative 4, there would be no impact to wetlands pursuant to CEQA.

(4) Interfere substantially with the movement of any native resident or migratory fish and wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Like the proposed project, this alternative would not inhibit the movement of wildlife in and around the area. No fencing or other terrestrial obstruction would be installed in this area. Small, medium, and large-sized wildlife would not be inhibited from moving through the proposed project site. With the implementation of Alternative 4, there would be no impact to wildlife movement pursuant to CEQA.

(5) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Like the proposed project, Alternative 4 would not conflict with local policies and ordinances. A review of the Bishop Resource Management Plan, Inyo County General Plan, and Lower Owens River Project Plan did not identify any conflicts resulting from the proposed project. Therefore, there would be no impact pursuant to CEQA.

(6) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

Like the proposed project, this alternative would not conflict with an adopted HCP or NCCP, or other approved state, local, or regional plan. The proposed project study area is not located within the boundaries of an HCP area, NCCP area, or any other planning area designated by any local, regional, or state agency. Therefore, there would be no impacts pursuant to CEQA.

4.3.2.6 Alternative 5, Dust Control Measures Applied to 194 Acres Using Irrigation Water Delivered via KCSD Water Well / Pipeline to Irrigation System and Selected Manual Watering

Under Alternative 5, the DCMs would be the same as the proposed project / proposed action. In Alternative 5, water obtained from the KCSD well would be transported to the project via a temporary pipeline that connects into the KCSD water system near the KCSD well site. Water would be supplied directly to the temporary irrigation system from the KCSD, in lieu of the District's Fault Test well. As with Alternatives 3 and 4, Alternative 5 would include a temporary aboveground irrigation system installed within the 95 percent control level area to provide water to the project area. Plants within the sensitive 85 percent control area would be watered by hand using the same method as described above. The ATV mounted tanks would be filled with water from the delivery system within the project. At locations where the access route crosses irrigation lines, temporary protective covers would be placed over the piping to allow travel over the system and prevent damage to the irrigation system. There would be approximately 124 total crossings of the irrigation lines (with 62 crossings of the 2-inch distribution laterals and 62 crossings of the 4-inch transmission line). Following the completion of each irrigation event the irrigation system would be drained of water. Approximately 200 gallons of water will be drained from each lateral in a manner to prevent flows off of the project area.

A. Direct and Indirect Impacts

The biological resources potentially affected by Alternative 5 are the same as those that would be potentially impacted by the proposed project / proposed action. There are no permanent impacts; 5.1 acres of temporary impacts would be anticipated to result from construction activities associated with Alternative 5, which is characterized by barren sand dune and interdune spaces. Based on the results of the pilot study, restoration of native vegetation is expected to achieve a minimum performance standard of 65 percent plant survival if irrigated during the 3 years following plant installation. The small electric booster pump is anticipated to cause minimal or no ground disturbance to a small area near or inside the facilities of the existing KCSD well site. Impacts to special status plant species would not be expected to occur during implementation of Alternative 5.

Alternative 5 would not be expected to result in potential impacts to federal and state listed wildlife species, BLM sensitive species, or California species of special concern.

Potential impacts to locally important species include minor potential direct and indirect impacts to Owens dune weevil, as described for the proposed project / proposed action: direct mortality to some individuals during grading activities for staging areas and access routes, and minor alteration of a small proportion of the species' overall habitat.

Potential impacts to state-designated sensitive habitats are not expected to occur as none were identified on-site or in immediately adjacent areas.

Potential impacts to waters and riparian habitat are not expected to occur as none were identified on-site or in immediately adjacent areas.

Potential impacts to wildlife movement and nursery sites are not expected to occur as none were identified on-site or in immediately adjacent areas.

Potential impacts to resources under this alternative are in conformance with the CDCA and maintain the integrity and intent of the Conservation Plan.

B. CEQA Significance Determinations

Would Alternative 5:

(1) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife and U.S. Fish and Wildlife Service?

Like the proposed project, this alternative could not adversely affect special federal and/or state listed species, as well as BLM sensitive wildlife species. With implementation of Alternative 5, the impact to special status species is considered a less than significant impact pursuant to CEQA.

(2) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Like the proposed project, this alternative would not affect riparian habitat or sensitive natural communities. With the implementation of Alternative 5, there would be no impact to sensitive native plant communities pursuant to CEQA.

(3) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Like the proposed project, this alternative would not impact federal and state protected wetlands/waters. With the implementation of Alternative 5, there would be no impact to wetlands pursuant to CEQA.

(4) Interfere substantially with the movement of any native resident or migratory fish and wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Like the proposed project, this alternative would not inhibit the movement of wildlife in and around the area. No fencing or other terrestrial obstruction would be installed in this area. Small, medium, and large-sized wildlife would not be inhibited from moving through the proposed project site. With the implementation of Alternative 5, there would be no impact to wildlife movement pursuant to CEQA.

(5) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Like the proposed project, Alternative 5 would not conflict with local policies and ordinances. A review of the Bishop Resource Management Plan, Inyo County General Plan, and Lower Owens River Project Plan did not identify any conflicts resulting from the proposed project. Therefore, there would be no impact pursuant to CEQA.

(6) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

Like the proposed project, this alternative would not conflict with an adopted HCP or NCCP, or other approved state, local, or regional plan. The proposed project study area is not located within the boundaries of an HCP area, NCCP area, or any other planning area designated by any local, regional, or state agency. Therefore, there would be no impacts pursuant to CEQA.

4.3.2.7 Alternative 6, No Project / No Action Alternative

Alternative 6 assumes that the DCMs would not be installed. This alternative would not require federal approval as no BLM land would be crossed. Under CEQA, continuation of natural habitats would be expected based on the current General Plan and Land Use Ordinance designations.

A. Direct and Indirect Impacts

Under Alternative 6, there would be no installation or maintenance activities; therefore, there would be no potential for direct or indirect impacts to biological resources.

B. CEQA Significance Determinations

Under Alternative 6, there would be no effect on biological resources.

4.3.3 MITIGATION MEASURES

The proposed project / proposed action would not be expected to result in adverse impacts to biological resources related to consistency with adopted federal, state, or regional conservation plans; therefore, mitigation measures are not required.

4.3.4 RESIDUAL IMPACTS AFTER MITIGATION

There would be no anticipated adverse impacts to biological resources.

4.4 CULTURAL RESOURCES

This section examines the possible effects that could result from the proposed project / proposed action, five proposed project / proposed alternatives, and the No Project / No Action alternative. The analysis is based on the Cultural Resources Technical Report, which is included as Appendix E of this document. The Paleontological Survey Report for the Keeler Dunes Project, Owens Lake, Inyo County, California[1] (hereafter Survey Report) summarizes existing cultural resource data in the proposed project / proposed action study area and vicinity as identified through literature review and archival records and supplemented by observations recorded during a field survey of the proposed project / proposed action study area. Due to the confidential nature of the location of cultural resources, this section does not include maps or location descriptions.

4.4.1 STUDY METHODS

4.4.1.1 LITERATURE REVIEW

The study methods used for the literature review follow standards outlined in BLM Manual Section 8110.21A for Class I inventories and through consultation with BLM were designed to provide the substantial evidence required to evaluate the potential impacts of the proposed project / proposed action on historic properties.[2] A cultural resources records search was conducted at the Eastern Information Center (EIC), housed at the University of California, Riverside. The search included reviews of all known relevant cultural resource survey and excavation reports to ascertain the presence of known prehistoric and historic archaeological resources within the cultural resources study area, which consisted of the proposed project / proposed action property plus a 1-mile buffer, and is located on the USGS 7.5-minute series, Dolomite, Owens Lake, Keeler, and Cerro Gordo Peak topographic quadrangle maps.[3,4,5,6] The California State Historic Resources Inventory, the NRHP, the listing of CHLs, and the California Points of Historical Interest were also searched during the EIC visit to ascertain the presence of potential historic resources within the proposed project / proposed action area. Finally, a search of the site files housed at the BLM Bishop Field Office was completed by BLM archaeologist (by Mr. Greg Haverstock), who provided Sapphos Environmental, Inc. with information on the cultural resources in the proposed project / proposed action area that are located on BLM land.

4.4.1.2 SURVEY AND SITE RECORDATION

Consultation with BLM (Mr. Greg Haverstock) resulted in a determination that a new Class III (intensive pedestrian) cultural resources survey of the entirety of the Area of Potential Effects (APE) was not warranted as a number of surveys had been completed within the dune complex and the cultural

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[1] SWCA Environmental Consultants. August 2013. *Paleontological Survey Report for the Keeler Dunes Project, Owens Lake, Inyo County, California*. Prepared for Sapphos Environmental, Inc. Pasadena, CA.

[2] BLM Manual, 8110 — Identifying and Evaluating Cultural Resources 8110.21A.1 (Rel. 8-73, 12/03/04) *available at* http://www.blm.gov/pgdata/etc/medialib/blm/wo/Planning_and_Renewable_Resources/coop_agencies/cr_publications.Par.44865.File.dat/Binder2-2.pdf (last visited May 6, 2013).

[3] U.S. Geological Survey. 1987. *7.5-Minute Series, Dolomite, California, Topographic Quadrangle*. Denver, CO.

[4] U.S. Geological Survey. 1987. *7.5-Minute Series, Owens Lake, California, Topographic Quadrangle*. Denver, CO.

[5] U.S. Geological Survey. 1987. *7.5-Minute Series, Keeler, California, Topographic Quadrangle*. Denver, CO.

[6] U.S. Geological Survey. 1987. *7.5-Minute Series, Cerro Gordo Peak, California, Topographic Quadrangle*. Denver, CO.

resources were well documented in the proposed project / proposed action area.[7] An intensive pedestrian survey was conducted by a Sapphos Environmental, Inc. archaeologists on July 23, 2013 of the proposed project / proposed action APE. A supplemental survey of areas associated with Alternatives 4 and 5 APEs was conducted on February 20, 2014 by BLM; Lone Pine Paiute-Shoshone Tribal representatives; and Sapphos Environmental Inc. archaeologists.

At the request of the BLM, Sapphos Environmental, Inc. recorded three previously undocumented, archaeological sites in support of the proposed project / proposed action during the July 2013 work. During supplemental surveys (February 2014), the BLM recorded one archaeological site and 17 archaeological isolates, which are included in this analysis. In addition to formally recording the archaeological resources, the sites were evaluated for inclusion on the NRHP and CRHR.

Fieldwork authorization was obtained by the BLM prior to the initiation of fieldwork (CA Cultural Use Permit Number CA-10-37). During supplemental surveys for the proposed project / proposed action, BLM and Sapphos Environmental, Inc. archaeologists conducted surveys, under the direction of BLM. Site recordation (July 2013) of the three sites requested by the BLM (Mr. Haverstock) was completed by Sapphos Environmental, Inc. (Dr. Tiffany Clark and Mr. Adam White) on September 25 and 26, 2012, and July 23 and 24, 2013. The ground surface in the area of three sites was thoroughly examined by the archaeologists, who used pin flags to mark the locations of identified features and artifacts. Once the extent and nature of the cultural deposits were defined, the sites were recorded on State of California Department of Parks and Recreation (DPR) 523 series site record forms. Field mapping of sites was primarily conducted with global positioning system (GPS) units; field sketch maps and photographs provided necessary supplemental documentation. The locations of the sites were subsequently mapped on the appropriate USGS topographic quadrangle using post-processed GPS data with elevations determined from USGS maps. No artifacts were collected during the site recordation.

4.4.1.3 Report

The documentation of cultural and paleontological resources for this proposed project / proposed action complies with the reporting specifications outlined in the BLM 8100 Manual guidance as stipulated in the BLM Cultural Resources Use Permit and Field Authorizations for this Undertaking, and with the *Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation* (48 FR 44716-44740), as well as the California Office of Historic Preservation Planning Bulletin Number 4(a), December 1989, *Archaeological Resource Management Reports* (ARMR). Sapphos Environmental, Inc. prepared a report for the proposed project / proposed action.[8] This study is the basis for the analysis provided herein.

4.4.1.4 Native American Participation

As the lead federal agency, the BLM invited tribes into consultation pursuant to Section 106 of the NHPA and other relevant regulations including Executive Order 13007. To date, four Native American tribes have been identified and invited to consult on the proposed project / proposed action. The BLM initiated government-to-government consultation by letter on October 17, 2011; October 24, 2011;

[7] Clark, Tiffany, Sapphos Environmental, Inc., Pasadena, CA. 16 March 2011. Contact Report to Greg Haverstock, BLM Bishop Field Office, Bishop, CA.

[8] Sapphos Environmental, Inc. 2012. *Keeler Dunes Dust Control Project, Screen Check Cultural Resource Technical Report*. Pasadena, CA

and December 2013. The BLM (Ms. Bernadette Lovato and Mr. Haverstock) conducted meetings with the tribes on November 5, 2011; January 20, 2012; and February 21, 2012, including a field visit to the proposed project / proposed action area. Upon reinitiating Section 106 consultation the BLM (Mr. Steve Nelson and Mr. Haverstock) conducted additional meetings with the tribes and the District on February 2, 2014, and February 11, 2014. The consultation process is still ongoing. Finally, a Native American monitor from the Lone Pine Paiute-Shoshone tribe accompanied archaeologists during the July 2013 and February 2014 surveys.

4.4.2 CEQA Significance Criteria / NEPA Requirements

For purposes of the analysis, the CEQA Significance Determinations and NEPA Requirements are discussed concurrently where applicable (i.e. with regard to CEQA Guidelines criterion). For NEPA disclosure, the impact analysis is referring to the proposed project / proposed action or one of the Alternatives. Direct effects (or impacts) are those occurring in the same place and time as the proposed project / proposed action with regard to construction and maintenance. Direct cultural resource impacts from the proposed project / proposed action or an alternative are related to disturbance or damage to cultural resources during construction and maintenance. Indirect effects (or impacts) are those that could result from the proposed project / proposed action or an alternative, but are not a direct result of the activity being undertaken, or occur later in time (for example after the construction and maintenance phase) or further removed in distance (for example, several miles from the proposed project / proposed action site).

Requirements for CEQA, NEPA, and the National Historic Preservation Act (NHPA) differ to varying degrees. Among the key differences is that NEPA and NHPA require a consultation process and require that significance determinations and mitigation measures be developed through the consultation process (36 CFR 800). In contrast, CEQA requires that the lead agency make an independent evaluation of the significance of impacts and does not require tribal consultation. Pub Res. Code § 21082.1(c) requires the lead agency to (1) independently review and analyze any report or declaration required by CEQA; (2) circulate draft documents that reflect its independent judgment; and (3) as part of the certification of an environmental impact report, find that the report or declaration reflects the independent judgment of the lead agency.

Archaeological resources may also qualify as "historical resources" and PRC § 5024 requires consultation with the State Office of Historic Preservation (SHPO) when a proposed project / proposed action may impact historical resources on state-owned land. The proposed project / proposed action and Alternatives do not impact a historical resource on state-owned land. As such, compliance with CEQA does not require a consultation.

The proposed project / proposed action has been designed to avoid all impacts to historic properties.

4.4.2.1 CEQA Significance Criteria

Appendix G of the CEQA Appendix G of the CEQA Guidelines 15064.5(a) and Sections 5024, 21083.2 and 21084.1 of the Public Resources Code, and CEQA Guidelines 15064.5(c) contain significance criteria regarding cultural resources. A substantial cultural resources impact would occur if implementation of the proposed project alternatives would:

(1) Cause a "substantial adverse change" in the "significance of a historical resource" as defined in CEQA Guidelines § 15064.5

Pursuant to CEQA Guidelines § 15064.5(a)(1) and (2), this includes a resource listed in or determined to be eligible for listing in the California Register of Historic Resource (PRC § 5024.1 (d)(1)), or a local register of historic places.

Generally, a resource is considered "historically significant" if it meets one of the following criteria for listing on the CRHR (PRC Section 5024.1) (CEQA Guidelines 15064.3 (a) (3):

- Associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States;
- Associated with the lives of persons important to local, California or national history;
- Embodies the distinctive characteristics of a type, period, region or method of construction or represents the work of a master or possesses high artistic values; or
- Has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California or the nation.

Historic resources eligible for listing in the California Register may include buildings, sites, structures, objects, and historic districts. A resource less than 50 years of age may be eligible if it can be demonstrated that sufficient time has passed to understand its historic importance. While the enabling legislation for the California Register is less rigorous with regard to the issue of integrity, there is the expectation that properties reflect their appearance during their period of significance (PRC § 4852).

In addition to meeting one of the above criteria, a resource must have integrity; that is, it must evoke the resource's period of significance or, in the case of criterion 4, it may be disturbed, but it must retain enough intact and undisturbed deposits to make a meaningful data contribution to regional research issues (CCR Title 14, Chapter 11.5 Section 4852 [c]).

State CEQA Guidelines Section 15064.5(b) defines "substantial adverse change" as physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significant of an historical resource is materially impaired, which occurs when a proposed project:

- Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the California Register of Historical Resources, National Register of Historic Resources, a local register or historic resources.
- Demolishes or materially alters in an adverse manner those physical characteristics that account for its identification in an historical resources survey meeting the requirements of PRC § 5024.1 (g), unless the public agency establishes by a preponderance of the evidence that the resource is not historically or culturally significant.

(2) Cause a "substantial adverse change" in the "significance of an archaeological resource" pursuant to CEQA Guidelines §15064.5

CEQA Guidelines 15064.5(c) (3) and PRC 21083.2(j), provide that if an archaeological site does not meet the historically significant criteria outlined above, but does meet the definition of a "unique archaeological resource" in PRC 21083.2, the site shall be treated in accordance with the provisions of PRC 21083.3.2, unless the applicant and public agency elect to comply with all other applicable provisions of CEQA with regards to archaeological resources. For the proposed project and

Alternative(s), the applicant and public agencies agree to treat any discovered unique archaeological resources as a historically significant resource.

"Unique archaeological resource" means an archaeological artifact, object or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- Contains information needed to answer important scientific research questions that there is a demonstrable public interest in that information.
- Has a special and particular quality such as being the oldest of its type or the best available example of its type.
- Is directly associated with a scientifically recognized important historic event or person.

CEQA Guidelines 15064.5(c) (4) confirms that if an archaeological resources is neither a unique archaeological nor an historic resource, the effects of the proposed project on those resources shall not be considered a significant impact on the environment.

(3) Disturb any human remains, including those interred outside of formal cemeteries

Impacts relevant to all four criteria are included in the discussion of environmental consequences.

4.4.2.2 NEPA REQUIREMENTS

The CEQA Criteria identified above also serve to fulfill the NEPA Requirement of a basis for analysis to evaluate potential impacts to cultural resources associated with the proposed action; action Alternatives 1, 2, 3, 4, and 5; and the No Action Alternative.

A. National Register of Historic Places

The National Register of Historic Places (NHPA) establishes laws for historic resources to "preserve important historic, cultural, and natural aspects of our national heritage, and to maintain, wherever possible, an environment that supports diversity and a variety of individual choice."

A property that qualifies for the NRHP is considered significant in terms of the planning process under the NHPA, NEPA, and other federal mandates. The National Register Criteria for Evaluation (36 CFR 60.4) provides guidance in determining a property's eligibility for listing on the NRHP.

B. Section 106 of the National Historic Preservation Act

Under Section 106 of the NHPA subsection 800.5 (Assessment of Adverse Effects) criteria for determining adverse effects are as follows:

> An *Adverse Effect* is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's

eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, by farther removed in distance or be cumulative.[9]

Examples of Adverse Effects on historic properties under 36 CFR 800.5 (a) (2) include, but are not limited to,

(i) Physical destruction of or damage to all or part of the property;
(ii) Alteration of a property that is not consistent with the Secretary of Interior's Standards for treatment of historic properties (36 CFR 68) and applicable guidelines;
(iii) Removal of the property from its historic location;
(iv) Change of the character of the property's use or of physical features within the property's setting that contribute to its historical significance;
(v) Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting;
(vi) Neglect of a property resulting in its deterioration or destruction; and
(vii) Transfer, lease, or sale of the property.

4.4.3 ENVIRONMENTAL CONSEQUENCES

4.4.3.1 PROPOSED PROJECT / PROPOSED ACTION, DUST CONTROL MEASURES APPLIED TO 194 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / ATVS

The proposed project / proposed action will entail the establishment and management of native vegetation and the use of straw bales as temporary windbreaks positioned within an area of approximately 194 acres in order to control PM_{10} dust emissions. Other project elements consist of infrastructure elements including a temporary access routes, temporary staging area for equipment and materials storage, and an effectiveness monitoring program (existing air monitoring stations). Water delivery to the site would be accomplished by water trucks transporting water from the District's Fault Test Well to the staging areas along the Old State Highway. Water would be loaded in to small water tanks (about 150–200 gallons) mounted on a trailer and pulled with an ATV and then irrigation would be conducted by hand through a small diameter hoses. Further details of the proposed project / proposed action are described in Section 2.1, *Proposed Project / Proposed Action*.

A. Direct and Indirect Impacts

Direct and indirect impacts to cultural resources resulting from the proposed project / proposed action will be avoided. Straw bales placement and the planting and establishment of native vegetation will be conducted with minimal ground disturbance from vehicle and foot traffic in the immediate area and would be implemented on modern active sand deposits that have a minimum potential for containing cultural resources. These disturbances are expected to disturb the ground surface and uppermost layers of soil only. Direct impacts from the preparation of four staging areas may result from minimal disturbance of the ground surface for each staging area. Indirect impacts from staging area preparation may result from increased vehicle and foot traffic.

[9] 36 CFR Part 800.5 [a] [1]

A total of 22 cultural resources (5 sites and 17 isolates) are located within the APE associated with the proposed project / proposed action and alternatives. A short description of each resource, along with NRHP and CRHR eligibility recommendations, is provided below (Table 4.4.3.1-1, *Eligibility Status of Cultural Resources Located in the APE*).

TABLE 4.4.3.1-1
ELIGIBILITY STATUS OF ARCHAEOLOGICAL SITES LOCATED IN THE APE

Site	Site Type	NRHP and CRHR Eligibility
CA-INY-6502	Rock cairns with associated prehistoric and historic artifact scatters	Recommended eligible under Criterion D (NRHP) and Criterion 4 (CRHR)
CA-INY-6513H	Section of the Carson & Colorado Railroad	Recommended not eligible
KD Site 1	Multicomponent site consisting of historic period artifact concentrations and a road alignment, and two possible prehistoric rock cairns	Recommended eligible under Criterion D (NRHP) and Criterion 4 (CRHR)
KD Site 2	Section of the Old State Highway	Recommended not eligible
BLM Site 1	Prehistoric lithic scatter and core	Recommended not eligible

CA-INY-6502 was originally recorded as two separate archaeological sites (CA-INY-6502 and CA-INY-6503), whose boundaries were later merged into one cultural resource.[10] The prehistoric remains at the site consist of concentrations of rock cairns with associated human remains, flaked and ground stone tools, pottery, shell, and animal bone. A small number of historic period artifacts, which range in date from the late 1800s to modern times, were also recorded at CA-INY-6502. The cultural resource has been recommended eligible for the NRHP and CRHR under Criterion D and Criterion 4, respectively, for its potential cultural and archaeological value.

CA-INY-6513H consists of a section of the Carson & Colorado Railroad line that originally ran from Mound House, Nevada to Keeler. The railway operated between 1883 and 1960. An evaluation of CA-INY-6513H conducted in 2006 by JRP Historical Consulting recommended that the site did not meet the criteria for listing either on the NRHP or the CRHR due to a lack of integrity.[11]

KD Site 1 is a multicomponent site consisting of six historic period artifact concentrations, a historic road alignment, and two possible prehistoric cairns. Temporally diagnostic materials recovered from the concentrations indicate that the area was used as a trash dump beginning in the late 1800s with continued use into the 1960s. KD Site 1 has been recommended eligible for the NRHP and CRHR under Criterion D and Criterion 4, respectively, for its potential cultural and archaeological value.

KD Site 2 consists of a section of the Old State Highway that runs from a point south of Keeler to a point north of Swansea along the northeastern edge of Owens Lake. Although once a significant transportation corridor within the Owens Valley, the site's integrity has been significantly compromised by erosional processes and the realignment of portions of the roadway. As such, the portion of KDS Site 2 within the proposed project / proposed action property is not recommended eligible for listing on the NRHP or CRHR.

[10] Primary Site Record for CA-INY-6502 and CA-INY-6503 (Update). n.d. Record on file at the Bureau of Land Management, Bishop Field Office, Bishop, CA.

[11] California Department of Parks and Recreation. 2006. Update to Primary Record for CA-INY-6513H. Site form on file at the Eastern Information Center, University of California, Riverside, CA.

BLM Site 1 consists of a small prehistoric lithic reduction site. The site was recorded by a BLM archeologist (Mr. Greg Haverstock) and is on file at the BLM Bishop Field Office. The site has been determined to not meet the criteria for listing either on the NRHP or the CRHR due to its limit for data potential.

TABLE 4.4.3.1-1
ELIGIBILITY STATUS OF ARCHAEOLOGICAL ISOLATES LOCATED IN THE APE

Resource ID	Period	Description	Eligibility Status
BLM ISO-1	Historic	Brown colored, thick walled, mold blown bottle	Recommended Not Eligible
BLM ISO-2	Historic	2 fragments of broken ceramic electrical insulator	Recommended Not Eligible
BLM ISO-3	Historic	Metal fragments, log bolt, large bolt	Recommended Not Eligible
BLM ISO-4	Historic	Sheet metal	Recommended Not Eligible
BLM ISO- 5	Historic	Steel pipe, 6 fragments,	Recommended Not Eligible
BLM ISO-6	Historic	2 fragments of broken ceramic electrical insulator	Recommended Not Eligible
BLM ISO-7	Historic	Steel sheet with bolt holes and opening, riveted	Recommended Not Eligible
BLM ISO- 8	Historic	Steel wire, 2 gauges, fragments, 9 segments	Recommended Not Eligible
BLM ISO-9	Historic	Ceramic electrical insulator fragments	Recommended Not Eligible
BLM ISO-10	Historic	Telephone pole cross member with insulated post	Recommended Not Eligible
BLM ISO-11	Historic	Karo syrup bottle fragment, clear glass (1968-present)	Recommended Not Eligible
BLM ISO-12	Historic	Gallon and 1/2 gallon wine jugs clear glass	Recommended Not Eligible
BLM ISO-13	Historic	Solarized brown Clorox bottle neck and rim (1958-present), and glass ketchup bottle, octagonal with solarized clear glass	Recommended Not Eligible
BLM ISO-14	Historic	Brown Duraglas been bottle(1947)	Recommended Not Eligible
BLM ISO-15	Historic	Brown Duraglas been bottle(1941)	Recommended Not Eligible
BLM ISO-16	Historic	Wire sand fence (8 strands)	Recommended Not Eligible
BLM ISO-17	Prehistoric	Elongated rock cairn	Recommended Not Eligible

Construction and Maintenance

Construction and maintenance of the proposed project / proposed action has been designed to avoid adverse effects to significant cultural resources that may be present within the proposed project / proposed action area. The portions of CA-INY-6502 and KD Site 1 located within the APE primarily fall within the area designated for 85 percent dust control efficiency. The DCM in these areas will be the planting of native vegetation and the placement of straw bales that will act as wind breaks within active dune areas. These materials will be transported to the vicinity of the area using all-terrain vehicles along a temporary access route that will be located north of CA-INY-6502. No vehicular traffic shall occur within the site boundaries. The vegetation and straw bales will be hand-carried along designated footpaths to their respective planting areas in active dune areas. The planting of vegetation will involve the hand excavation of small holes (less than 1 foot in depth) for the placement of individual plants. The plants will be clustered in groups of three along the base of each straw bale.

The 85 percent dust control efficiency that would be implemented during the proposed project / proposed action allows some flexibility in the locations of the straw bales and associated plants. As such, areas within CA-INY-6502 and KD Site1 that contain culturally sensitive deposits can be avoided under the proposed project / proposed action. These areas tend to be located in deflated areas between the active dunes where cultural deposits have been exposed by moving sands.

Several additional efforts have been incorporated into the proposed project / proposed action to avoid adverse effects to significant cultural deposits within the proposed project / proposed action area. To ensure that no cultural deposits are adversely affected by the transport and placement of the vegetation and straw bales, a qualified archaeologist and Native American monitors will undertake an intensive surface survey of the APE, using special consideration for the portions of CA-INY-6502 and KD Site1 falling within the APE, prior to the initiation of construction activities with a Native American monitor present. This work will involve the identification and recording of identified artifacts and features, including those previously identified within the site boundary of CA-INY-6502 and KD Site1 and any newly identified cultural deposits within the APE, using handheld GPS units. A spatial analysis in GIS will then be undertaken to determine the specific placement of vegetation, straw bales, and foot paths within the site boundary of CA-INY-6502 and KD Site1, as well as any other identified cultural deposits within the APE, in order to avoid impacts to significant cultural deposits. Prior to the initiation of ground-disturbing activities, the District shall submit a final proposed construction scenario to the BLM for approval that depicts the location of these proposed project / proposed action elements and their relation to surface artifacts and features.

B. CEQA Significance Determinations

Would the proposed project:

(1) Cause a "substantial adverse change" in the "significance of a historical resource" as defined in CEQA Guidelines § 15064.5?

The proposed project APE includes a total of 22 cultural resources, two of which are archaeological resources (CA-INY-6502 and KD Site 1) that have been identified as eligible for listing on the NRHP and CRHR, and thereby are considered significant "historical resources" under CEQA. The three remaining cultural resources (CA-INY-6513H, KD Site 2, BLM Site 1, and 17 archaeological isolates [BLM]) are not considered eligible for listing on the NRHP or CRHR and, therefore, do not fit the definition of a "historical resource" under CEQA. The proposed project has been designed to avoid impacts to significant cultural deposits associated with the two historic resources (see *Cultural Resources Protection* in Section 2.0). As a result of the implementation of these avoidance measures, the construction and operation of the proposed project would not be expected to cause "a substantial adverse change" in the "significance" of the two (CA-INY-6502 and KD site 1) historical resources.

(2) Cause a "substantial adverse change" in the "significance of an archaeological resource" pursuant to CEQA Guidelines §15064.5?

The proposed project APE includes a total of twenty-two cultural resources, two of which are archaeological resources (CA-INY-6502 and KD Site 1) that have been identified as eligible for listing on the NRHP and CRHR, and thereby are considered "significant archaeological resource" under CEQA. The remaining cultural resources (CA-INY-6513H and, KD Site 2, BLM Site 1, and seventeen archaeological isolates [BLM]) are not considered eligible for listing on the NRHP or CRHR, and therefore do not fit the definition of a "significant archaeological resources" under CEQA. The proposed project has been designed to avoid impacts to significant cultural deposits associated with these eligible resources (see Cultural Resources Protection in Section 2.0). As a result of the implementation of these avoidance measures, the construction and operation of the proposed project would not be expected to cause "a substantial adverse change" in the "significance" of these eligible archaeological sites (CA-INY-6502 and KD Site 1).

(3) Disturb any human remains, including those interred outside of formal cemeteries?

The site of CA-INY-6502 is part of a larger mortuary complex containing multiple prehistoric and possibly historic period burial features that include human remains. The proposed project has been designed to avoid impacts to these significant cultural deposits, including human remains, at this archaeological site (see *Cultural Resources Protection* in Section 2.0). As a result of the implementation of these avoidance measures, the construction and operation of the proposed project would not be expected to adversely impact human remains or any other significant cultural deposits at CA-INY-6502.

4.4.3.2 Alternative 1, Dust Control Measures Applied to 214 Acres Using Irrigation Water Delivered via Water Trucks / ATVs

Under Alternative 1, construction would be essentially the same as for the proposed project / proposed action (as described in Section 2.2.2). The primary difference between the alternatives would be the total number of plants and straw bales that would be transported to the project site and distributed onto a larger area (20 additional acres) of dust control. Alternative 1 would result in a greater number of plants and straw bales; hence, additional workers and equipment may be necessary to complete the alternative in the same time frame as the proposed project / proposed action. As with the proposed project / proposed action, supplemental irrigation in the first 3 years following installation of native vegetation would be completed via hauling of water in small water tanks (about 150–200 gallons) mounted on a trailer and pulled with an ATV and then irrigation would be conducted by hand through a small diameter hose.

A. Direct and Indirect Impacts

Construction and operation of Alternative 1 would be much the same as the proposed project / proposed action but would require the placement of a greater number of plants and straw bales distributed over a larger area. The cultural resources potentially affected by Alternative 1 are the same as those that would be potentially affected by the proposed project / proposed action (see Section 4.4.3.1).

B. CEQA Significance Determinations

Would the proposed project:

(1) Cause a "substantial adverse change" in the "significance of a historical resource" as defined in CEQA Guidelines § 15064.5?

The Alternative 1 APE includes a total of 22 cultural resources, two of which are archaeological resources (CA-INY-6502 and KD Site 1) that have been identified as eligible for listing on the NRHP and CRHR and thereby are considered significant "historical resources" under CEQA. The three remaining cultural resources (CA-INY-6513H, KD Site 2, BLM Site 1, and 17 archaeological isolates [BLM]) are not considered eligible for listing on the NRHP or CRHR and, therefore, do not fit the definition of a "historical resource" under CEQA. Alternative 1 has been designed to avoid impacts to significant cultural deposits associated with the two historic resources (see *Cultural Resources Protection* in Section 2.0). As a result of the implementation of these avoidance measures, the construction and operation of Alternative 1 would not be expected to cause "a substantial adverse change" in the "significance" of the two identified (CA-INY-6502 and KD site 1) historical resources.

(2) Cause a "substantial adverse change" in the "significance of an archaeological resource" pursuant to CEQA Guidelines §15064.5?

The Alternative 1 APE includes a total of 22 cultural resources, two of which are archaeological resources (CA-INY-6502 and KD Site 1) that have been identified as eligible for listing on the NRHP and CRHR and thereby are considered "significant archaeological resource" under CEQA. The remaining cultural resources (CA-INY-6513H and, KD Site 2, BLM Site 1, and 17 archaeological isolates [BLM]) are not considered eligible for listing on the NRHP or CRHR and, therefore, do not fit the definition of a "significant archaeological resources" under CEQA. Alternative 1 has been designed to avoid impacts to significant cultural deposits associated with these eligible resources (see Cultural Resources Protection in Section 2.0). As a result of the implementation of these avoidance measures, the construction and operation of Alternative 1 would not be expected to cause "a substantial adverse change" in the "significance" of these eligible archaeological sites (CA-INY-6502 and KD Site 1).

(3) Disturb any human remains, including those interred outside of formal cemeteries?

As with the proposed project, Alternative 1 has been designed to avoid impacts to culturally sensitive areas (CA-INY-6502) that may contain human remains. As a result of the implementation of these avoidance measures, the construction and operation of Alternative 1 is not expected to cause "a substantial adverse change" in the "significance" of these resources.

4.4.3.3 ALTERNATIVE 2, DUST CONTROL MEASURES APPLIED TO 197 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / ATVS

Alternative 2 has DCMs applied at different intensities in different areas of the Keeler Dunes, and the total acreage treated is 3 acres larger than the proposed project / proposed action (as described in Section 2.2.3) This alternative focuses on applying the highest intensity of dust control (95 percent control efficiency) across the Keeler Dunes and inter-dune sand sheet areas (170 acres), while applying less intensive controls on other inter-dune and sensitive cultural areas (27 acres at 90 percent dust control efficiency). The staging areas, access routes, construction scenario, and watering would remain the same as for the proposed project / proposed action; only the numbers of straw bales and plants and the area they are applied to would be increased by less than 3 percent due to the additional 3 acres to be treated. The construction scenario, access routes, staging areas and other design features would be largely the same as for the proposed project / proposed action although the area of impact would be 3 acres larger.

A. Direct and Indirect Impacts

Construction and operation of Alternative 2 would be much the same as the proposed project / proposed action, but would require the placement of a greater number of plants and straw bales distributed over a larger area. The cultural resources potentially affected by Alternative 2 are the same as those that would be potentially affected by the proposed project / proposed action (see Section 4.3.3.1).

B. CEQA Significance Determinations

Would Alternative 2:

(1) Cause a "substantial adverse change" in the "significance of a historical resource" as defined in CEQA Guidelines § 15064.5?

The Alternative 2 APE includes a total of 22 cultural resources, two of which are archaeological resources (CA-INY-6502 and KD Site 1) that have been identified as eligible for listing on the NRHP and CRHR and thereby are considered significant "historical resources" under CEQA. The three remaining cultural resources (CA-INY-6513H, KD Site 2, BLM Site 1, and 17 archaeological isolates [BLM]) are not considered eligible for listing on the NRHP or CRHR and, therefore, do not fit the definition of a "historical resource" under CEQA. Alternative 2 has been designed to avoid impacts to significant cultural deposits associated with the two historic resources (see *Cultural Resources Protection* in Section 2.0). As a result of the implementation of these avoidance measures, the construction and operation of Alternative 2 would not be expected to cause "a substantial adverse change" in the "significance" of the two identified (CA-INY-6502 and KD site 1) historical resources.

(2) Cause a "substantial adverse change" in the "significance of an archaeological resource" pursuant to CEQA Guidelines §15064.5?

The Alternative 2 APE includes a total of 22 cultural resources, two of which are archaeological resources (CA-INY-6502 and KD Site 1) that have been identified as eligible for listing on the NRHP and CRHR and thereby are considered "significant archaeological resource" under CEQA. The remaining cultural resources (CA-INY-6513H and, KD Site 2, BLM Site 1, and 17 archaeological isolates [BLM]) are not considered eligible for listing on the NRHP or CRHR and, therefore, do not fit the definition of a "significant archaeological resources" under CEQA. Alternative 2 has been designed to avoid impacts to significant cultural deposits associated with these eligible resources (see Cultural Resources Protection in Section 2.0). As a result of the implementation of these avoidance measures, the construction and operation of Alternative 2 would not be expected to cause "a substantial adverse change" in the "significance" of these eligible archaeological sites (CA-INY-6502 and KD Site 1).

(3) Disturb any human remains, including those interred outside of formal cemeteries?

As with the proposed project, Alternative 2 has been designed to avoid impacts to culturally sensitive areas (CA-INY-6502) that may contain human remains. As a result of the implementation of these avoidance measures, the construction and operation of Alternative 2 would not be expected to cause "a substantial adverse change" in the "significance" of these resources.

4.4.3.4 ALTERNATIVE 3, DUST CONTROL MEASURES APPLIED TO 194 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / TANKS / PVC IRRIGATION SYSTEM AND SELECTED MANUAL WATERING

Alternative 3 integrates refinements to the proposed project / proposed action that resulted from lessons learned from the pilot study that was undertaken by the District to assess the feasibility of the proposed project / proposed action and to address concerns that were raised by representatives of the Native American tribes during the consultation that was undertaken pursuant to Section 106 of the National Historic Preservation Act. Under Alternative 3, the DCMs would be the same as the proposed project / proposed action (as described in Section 2.2.4). Water obtained from the District's production well at the Fault Test site would be transported to the project via large water trucks to temporary storage tanks located at the three of the four designated staging areas. Since the staging areas are lower in elevation than the project area, each staging area would need to have a manifold and booster pump to pressurize the irrigation system. The use of water tanks mounted on ATVs, to distribute supplemental irrigation during the operations and maintenance phase of the project, would be replaced with a temporary aboveground irrigation system that would be installed within the 95 percent control level area to provide water to the project area. Plants within the sensitive 85 percent control area would be manually watered using the same method as described proposed project/proposed action. In the environmentally sensitive areas, the ATV mounted tanks would be filled with water from the delivery system within the project instead of from trucks at the staging areas.

A. Direct and Indirect Impacts

Construction and operation of Alternative 3 would be much the same as the proposed project / proposed action, but would require the installation of an irrigation system (with the exception of environmentally sensitive areas) to limit travel in the dunes for watering plants within the first 3 years. The use of the temporary irrigation system to deliver supplemental irrigation water would reduce ATV trips by approximately 80 percent during the operation and maintenance phase of Alternative 3.The cultural resources potentially affected by Alternative 3 are the same as those that would be potentially affected by the proposed project / proposed action.

B. CEQA Significance Determinations

Would Alternative 3:

(1) Cause a "substantial adverse change" in the "significance of a historical resource" as defined in CEQA Guidelines § 15064.5?

The Alternative 3 APE includes a total of 22 cultural resources, two of which are archaeological resources (CA-INY-6502 and KD Site 1) that have been identified as eligible for listing on the NRHP and CRHR and thereby are considered significant "historical resources" under CEQA. The three remaining cultural resources (CA-INY-6513H, KD Site 2, BLM Site 1, and 17 archaeological isolates [BLM]) are not considered eligible for listing on the NRHP or CRHR and, therefore, do not fit the definition of a "historical resource" under CEQA. Alternative 3 has been designed to avoid impacts to significant cultural deposits associated with the two historic resources (see *Cultural Resources Protection* in Section 2.0). As a result of the implementation of these avoidance measures, the construction and operation of Alternative 3 would not be expected to cause "a substantial adverse change" in the "significance" of the two identified (CA-INY-6502 and KD site 1) historical resources.

(2) Cause a "substantial adverse change" in the "significance of an archaeological resource" pursuant to CEQA Guidelines §15064.5?

The Alternative 3 APE includes a total of 22 cultural resources, two of which are archaeological resources (CA-INY-6502 and KD Site 1) that have been identified as eligible for listing on the NRHP and CRHR and thereby are considered "significant archaeological resource" under CEQA. The remaining cultural resources (CA-INY-6513H and, KD Site 2, BLM Site 1, and 17 archaeological isolates [BLM]) are not considered eligible for listing on the NRHP or CRHR and, therefore, do not fit the definition of a "significant archaeological resources" under CEQA. Alternative 3 has been designed to avoid impacts to significant cultural deposits associated with these eligible resources (see Cultural Resources Protection in Section 2.0). As a result of the implementation of these avoidance measures, the construction and operation of the Alternative 3 would not be expected to cause "a substantial adverse change" in the "significance" of these eligible archaeological sites (CA-INY-6502 and KD Site 1).

(3) Disturb any human remains, including those interred outside of formal cemeteries?

As with the proposed project, Alternative 3 has been designed to avoid impacts to culturally sensitive areas (CA-INY-6502) that may contain human remains. As a result of the implementation of these avoidance measures, the construction and operation of Alternative 3 would not be expected to cause "a substantial adverse change" in the "significance" of these resources.

4.4.3.5 Alternative 4, Dust Control Measures Applied to 194 Acres Using Irrigation Water Delivered via Water Trucks / PVC Irrigation System and Selected Manual Watering

Alternative 4 integrates refinements to the proposed project / proposed action that resulted from lessons learned from the pilot study that was undertaken by the District to assess the feasibility of the proposed project / proposed action and to address concerns that were raised by representatives of the Native American tribes during the consultation that was undertaken pursuant to Section 106 of the National Historic Preservation Act. Under Alternative 4, the DCMs would be the same as the proposed project / proposed action (as described in Section 2.25). In Alternative 4, water obtained from the Fault Test Well would be transported to the project via water trucks and the water delivery system would be fed from three supply points along State Route 136. As with Alternative 3, plants within the 95 percent control area would be watered with hoses attached to the laterals of the temporary PVC irrigation system. In this alternative, water trucks would stage next to the highway and deliver water directly in to the temporary PVC irrigation system, rather than utilizing water tanks at the staging areas for temporary storage. As in Alternative 3, hand watering would be done in approximately 8 percent of the dust control area using hoses to deliver water from tanks mounted on ATVs, stage in a manner to avoid sensitive cultural resources. As with the temporary irrigation system, the ATV mounted tanks would be filled with water from the delivery system within the project instead of from tanks at the staging areas.

This alternative is intended to address concerns articulated by the Lone Pine Paiute-Shoshone Tribe regarding the placement of a temporary irrigation system in close proximity to environmentally sensitive areas. In addition, the use of a direct connection from water haul trucks to the temporary irrigation system negates the need for temporary placement of water storage tanks at three of the four staging areas, further addressing issues articulated by representative of the Lone Pine and Big Pine Tribes. Additionally, the District shall work with representatives of the local Native American tribes, to include their participation, to the maximum extent practicable, in the installation of the plants, particularly in sensitive areas.

A. Direct and Indirect Impacts

Construction and operation of Alternative 4 would be much the same as the proposed project / proposed action but would include a combination of hand watering and installation of a temporary irrigation system to limit travel in the dunes for watering plants within the first 3 years following revegetation. The use of the temporary irrigation system to deliver supplemental irrigation water would reduce ATV trips by approximately 80 percent during the operation and maintenance phase of Alternative 3. The cultural resources potentially affected by Alternative 4 are the same as those that would be potentially affected by the proposed project / proposed action.

B. CEQA Significance Determinations

Would Alternative 4:

(1) Cause a "substantial adverse change" in the "significance of a historical resource" as defined in CEQA Guidelines § 15064.5?

The Alternative 4 APE includes a total of 22 cultural resources, two of which are archaeological resources (CA-INY-6502 and KD Site 1) that have been identified as eligible for listing on the NRHP and CRHR and thereby are considered significant "historical resources" under CEQA. The three remaining cultural resources (CA-INY-6513H, KD Site 2, BLM Site 1, and 17 archaeological isolates [BLM]) are not considered eligible for listing on the NRHP or CRHR and, therefore, do not fit the definition of a "historical resource" under CEQA. Alternative 4 has been designed to avoid impacts to significant cultural deposits associated with the two historic resources (see *Cultural Resources Protection* in Section 2.0). As a result of the implementation of these avoidance measures, the construction and operation of Alternative 4 would not be expected to cause "a substantial adverse change" in the "significance" of the two identified (CA-INY-6502 and KD site 1) historical resources.

(2) Cause a "substantial adverse change" in the "significance of an archaeological resource" pursuant to CEQA Guidelines §15064.5?

The Alternative 4 APE includes a total of 22 cultural resources, two of which are archaeological resources (CA-INY-6502 and KD Site 1) that have been identified as eligible for listing on the NRHP and CRHR and thereby are considered "significant archaeological resource" under CEQA. The remaining cultural resources (CA-INY-6513H and, KD Site 2, BLM Site 1, and 17 archaeological isolates [BLM]) are not considered eligible for listing on the NRHP or CRHR and, therefore, do not fit the definition of a "significant archaeological resources" under CEQA. Alternative 4 has been designed to avoid impacts to significant cultural deposits associated with these eligible resources (see Cultural Resources Protection in Section 2.0). As a result of the implementation of these avoidance measures, the construction and operation of Alternative 4 would not be expected to cause "a substantial adverse change" in the "significance" of these eligible archaeological sites (CA-INY-6502 and KD Site 1).

(3) Disturb any human remains, including those interred outside of formal cemeteries?

As with the proposed project, Alternative 4 has been designed to avoid impacts to culturally sensitive areas (CA-INY-6502) that may contain human remains. As a result of the implementation of these avoidance measures, the construction and operation of Alternative 4 would not be expected to cause "a substantial adverse change" in the "significance" of these resources.

4.4.3.6 Alternative 5, Dust Control Measures Applied to 194 Acres Using Irrigation Water Delivered via KCSD Water Well / Pipeline to Irrigation System and Selected Manual Watering

Alternative 5 integrates refinements to the proposed project / proposed action that resulted from lessons learned from the pilot study that was undertaken by the District to assess the feasibility of the proposed project / proposed action and to address concerns that were raised by representatives of the Native American tribes during the consultation that was undertaken pursuant to Section 106 of the National Historic Preservation Act. Under Alternative 5, the DCMs would be the same as the proposed project / proposed action. In Alternative 5, water obtained from the KCSD well would be transported to the project via a temporary pipeline that connects into the KCSD water system near the KCSD well site. Water would be supplied directly to the temporary irrigation system from the KCSD, in lieu of the District's Fault Test well. As with Alternatives 3 and 4, Alternative 5 would include a temporary aboveground irrigation system installed within the 95 percent control level area to provide water to the project area. Plants within the sensitive 85 percent control area would be watered by hand using the same method as described above. The ATV mounted tanks would be filled with water from the delivery system within the project.

This alternative is intended to address concerns articulated by the Lone Pine Paiute-Shoshone Tribe regarding the placement of a temporary irrigation system in close proximity to environmentally sensitive areas. In addition, the use of a direct connection from water haul trucks to the temporary irrigation system negates the need for temporary placement of water storage tanks at three of the four staging areas, further addressing issues articulated by representative of the Lone Pine Paiute-Shoshone and Big Pine Paiute Tribes.

A. Direct and Indirect Impacts

Construction and operation of Alternative 5 would be much the same as the proposed project / proposed action but would include a combination of hand watering and installation of a temporary irrigation system via a pipeline connection from the KCSD well for the first three years. The cultural resources potentially affected by Alternative 5 are the same as those that would be potentially affected by the proposed project / proposed action.

B. CEQA Significance Determinations

Would Alternative 5:

(1) Cause a "substantial adverse change" in the "significance of a historical resource" as defined in CEQA Guidelines § 15064.5?

The Alternative 5 APE includes a total of 22 cultural resources, two of which are archaeological resources (CA-INY-6502 and KD Site 1) that have been identified as eligible for listing on the NRHP and CRHR and thereby are considered significant "historical resources" under CEQA. The three remaining cultural resources (CA-INY-6513H, KD Site 2, BLM Site 1, and 17 archaeological isolates [BLM]) are not considered eligible for listing on the NRHP or CRHR and, therefore, do not fit the definition of a "historical resource" under CEQA. Alternative 5 has been designed to avoid impacts to significant cultural deposits associated with the two historic resources (see *Cultural Resources Protection* in Section 2.0). As a result of the implementation of these avoidance measures, the construction and operation of Alternative 5 would not be expected to cause "a substantial adverse change" in the "significance" of the two identified (CA-INY-6502 and KD site 1) historical resources.

(2) Cause a "substantial adverse change" in the "significance of an archaeological resource" pursuant to CEQA Guidelines §15064.5?

The Alternative 5 APE includes a total of 22 cultural resources, two of which are archaeological resources (CA-INY-6502 and KD Site 1) that have been identified as eligible for listing on the NRHP and CRHR and thereby are considered "significant archaeological resource" under CEQA. The remaining cultural resources (CA-INY-6513H and, KD Site 2, BLM Site 1, and 17 archaeological isolates [BLM]) are not considered eligible for listing on the NRHP or CRHR, and therefore do not fit the definition of a "significant archaeological resources" under CEQA. Alternative 5 has been designed to avoid impacts to significant cultural deposits associated with these eligible resources (see Cultural Resources Protection in Section 2.0). As a result of the implementation of these avoidance measures, the construction and operation Alternative 5 would not be expected to cause "a substantial adverse change" in the "significance" of these eligible archaeological sites (CA-INY-6502 and KD Site 1).

(3) Disturb any human remains, including those interred outside of formal cemeteries?

As with the proposed project, Alternative 5 has been designed to avoid impacts to culturally sensitive areas (CA-INY-6502) that may contain human remains. As a result of the implementation of these avoidance measures, the construction and operation of Alternative 5 would not be expected to cause "a substantial adverse change" in the "significance" of these resources.

4.4.3.7 Alternative 6, No Project / No Action Alternative

Alternative 6 assumes that the DCMs would not be installed. Alternative 6 would not require federal approval, as no BLM land would be crossed. Under CEQA, continuation of natural habitats would be expected based on the current General Plan and Land Use Ordinance designations.

A. Direct and Indirect Impacts

Under Alternative 6 there would be no installation or maintenance activities under this alternative; therefore, there would be no potential for direct or indirect impacts to cultural resources as a result of the proposed project / proposed action. However, sensitive resources that are known to be present in the vicinity of the proposed project / proposed action would continue to be at risk from natural processes and anthropogenic activities.

B. CEQA Significance Determinations

Under Alternative 6 there would be no effect to cultural resources.

4.4.4 MITIGATION MEASURES

Implementation of the proposed project / proposed action is not expected to result in significant impacts to cultural resources as a result of the predetermined project design elements incorporated to avoid any adverse effects, which includes, but is not limited to, a pre-placement pedestrian survey conducted by a qualified archaeologist with a Native American monitor; therefore, mitigation measures are not required. Refer to Section 4.4.3.1A for more detail related to the additional project design elements.

4.4.5 RESIDUAL IMPACTS AFTER MITIGATION

There would be no anticipated significant impacts to cultural resources under the proposed project / proposed action.

4.5 GEOLOGY AND SOILS

4.5.1 STUDY METHODS

This section assesses the possible effects of geological hazards that could result from the proposed project / proposed action and alternatives. The section addresses potential environmental impacts associated with implementation of the proposed project / proposed action such as exposure to seismic activity, unstable soils, and so forth. The District has incorporated measures into the proposed project / proposed action description to reduce or avoid adverse impacts anticipated from activities resulting from the proposed project / proposed action and its alternatives. A discussion of cumulative impacts related to geology and soil resources is included in Section 5.5. The geology and soils environmental setting is presented in Section 3.5. The existing conditions were evaluated based on their potential to be affected by activities of the proposed project / proposed action and alternatives.

4.5.2 CEQA SIGNIFICANCE CRITERIA / NEPA REQUIREMENTS

For purposes of the analysis, the CEQA Significance Determinations and NEPA Requirements are discussed concurrently where applicable (i.e. with regard to CEQA Guidelines criterion). For NEPA disclosure, the impact analysis is referring to the proposed project / proposed action or an alternative. Direct effects (or impacts) are those occurring as a result of the installation, maintenance, or monitoring of the straw bales and vegetation establishment. Direct natural resource impacts are those that occur due to potential geologic, soils, and/or seismic hazards during construction, or operation and maintenance. Indirect effects (or impacts) are those that could result from the proposed project / proposed action or an alternative, after the installation and monitoring has been completed.

4.5.2.1 CEQA SIGNIFICANCE CRITERIA

The potential for the proposed project to result in impacts to geology and soils was analyzed in relation to the questions contained in Appendix G of the State CEQA Guidelines. Under CEQA, the potential for the proposed project or project alternatives to result in impacts related to geology and soils was analyzed in relation to the questions contained in Appendix G of the State CEQA Guidelines. A significant impact on geology and soils would normally be determined to occur if the proposed project or project alternatives triggered one of the five thresholds established by Appendix G of the CEQA Guidelines:

The potential for the proposed project to result in impacts related to geology and soils was analyzed in relation to the questions contained in Appendix G of the State CEQA Guidelines. The proposed project would normally be considered to have a significant impact from geologic hazards when the potential for any one of the following thresholds occurs:

(1) Expose people or structures to potential substantial adverse effects, including the risk for loss, injury, or death involving:
   - Rupture of a known earthquake fault, as delineated on the most recent APEFZ Map issued by the State Geologist for the area or based on other substantial evidence of a known fault
   - Strong seismic ground shaking
   - Seismic-related ground failure, including liquefaction
   - Landslides

(2) Result in substantial soil erosion (greater than 10 percent) or the loss of topsoil

(3) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse

(4) Be located on expansive soil, as defined in Table 18-1-B of the 1994 Uniform Building Code, creating substantial risks to life or property

(5) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water

4.5.2.2 NEPA Requirements

The CEQA Criteria identified above also serve to fulfill the NEPA Requirement of a basis for analysis to evaluate geology and soils effects associated with the proposed action and alternatives.

4.5.3 Environmental Consequences

4.5.3.1 Proposed Project / Proposed Action, Dust Control Measures Applied to 194 Acres Using Irrigation Water Delivered via Water Trucks / ATVs

The proposed project / proposed action is a program to control dust emissions in the Keeler Dunes through the use of native plants and temporary wind breaks (straw bales) applied to a total of 194 acres of the emissive deposits in the dunes. The key components of the proposed project / proposed action include placement of straw bales on the site, planting of native vegetation, preparation of staging areas, access routes, water supply, conveyance and distribution, and an effectiveness monitoring program as part of the operations phase of the proposed project / proposed action. Further details of the proposed project / proposed action are described in Section 2.

A. Direct and Indirect Impacts

Direct and indirect impacts to geological resources resulting from the proposed project / proposed action are minimal. Direct impacts to soil include ground disturbance resulting from the planting and establishment of native vegetation, placement of straw bales, and establishment of temporary access routes, Indirect impacts to geology and soils include increased vehicle and foot traffic along designated routes on soils.

B. CEQA Significance Determinations

(1) Expose people or structures to potential substantial adverse effects, including the risk for loss, injury, or death involving:

- Rupture of a known earthquake fault, as delineated on the most recent APEFZ Map issued by the State Geologist for the area or based on other substantial evidence of a known fault

- Strong seismic ground shaking
- Seismic-related ground failure, including liquefaction
- Landslides

Surface Fault Rupture

The proposed project / proposed action would not be expected to result in significant impacts related to surface fault rupture. Faults are the planes along which earthquakes occur. Where earthquakes are large enough, or shallow enough, surface rupture can occur along the fault plane where it intersects the earth's surface. Geophysical surveys have revealed numerous fault strands on the bed of Owens Lake, with most roughly following a northwest-southeast trend.[1] The proposed project / proposed action study area is not delineated by the California Geological Survey as an APEFZ.[2] There are no documented fault scarps in the proposed project / proposed action study area.[3] The proposed project / proposed action would not involve construction of any type of building; therefore, there would be no exposure of buildings to surface fault ruptures that would expose people or structures to potential substantial adverse effects. Therefore, the proposed project / proposed action would not be expected to result in significant impacts to geology and soils related to the risk of exposure to surface fault rupture.

Seismic Ground Shaking

The proposed project / proposed action would not be expected to result in significant impacts from strong seismic ground shaking. All of California is at risk from seismic ground shaking and, as described previously in Section 3.5, the Sierra Nevada and Owens Valley Fault Zones are both capable of generating earthquakes with a magnitude of 8.0 or greater. The proposed project / proposed action study area is not delineated by the California Geological Survey as an APEFZ.[4] The proposed project / proposed action study area is not delineated by the California Geological Survey under the SHZP.[5] The proposed project does not include structures or the addition of a permanent or regular population on site. Therefore, the proposed project / proposed action would not expose people or structures to potential substantial adverse effects related to strong seismic ground shaking.

Seismic-Related Ground Failure/Liquefaction

The proposed project / proposed action would not be expected to result in significant impacts from seismic related ground failure, including liquefaction. Liquefaction occurs when saturated, cohesionless (low relative density) materials (usually sand or silty sand) are transformed from a solid to a near liquid state due to the increase in pore water pressure that can be caused by moderate to severe seismic ground shaking. The depth to groundwater in the proposed project / proposed action study area ranges from approximately 196 feet on the eastern border, east of SR 136, to within a few feet of the surface along the southwestern study area border. The soils in the proposed project / proposed

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[1] Neponset Geophysical and Aquilla Geosciences, 1997, Final Report, Phase 3 and 4Seismic Program, Owens Lake, Inyo County, California, prepared for the Great Basin Unified Air Pollution Control District. Bishop, CA,.

[2] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Alquist-Priolo Earthquake Fault Zone Maps. Available at: http://www.quake.ca.gov/gmaps/ap/ap_maps.htm

[3] Slemmons, D.B., Vittori, E., Jayko, A.S., Carver, G.A., Bacon, S.N. 2008. *Quaternary Fault and Lineament Map of Owens Valley, Inyo County, Eastern California*. Geological Society of America. Boulder, Colorado.

[4] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Alquist-Priolo Earthquake Fault Zone Maps. Available at: http://www.quake.ca.gov/gmaps/ap/ap_maps.htm

[5] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Seismic Hazard Zonation Program. Available at: http://www.conservation.ca.gov/cgs/shzp/Pages/index.aspx

action study area vary from loose gravels and sands to compact clays.[6] The conditions for liquefaction may be present along the historic shoreline, in the extreme southern portion of the proposed project / proposed action study area where the soils are finer texture and the groundwater is close to the surface. Due to the presence of coarse alluvial material over most of the rest of the proposed project / proposed action study area and the overall depth of the groundwater, the conditions for liquefaction over the rest of the proposed project / proposed action study area is considered to be low. In addition, the proposed project / proposed action does not expose people or structures to potential substantial adverse effects involving strong seismic-related ground failure, including liquefaction. Since habitable structures will not be built as part of the proposed project / proposed action, people or structures will not be exposed to adverse effects involving seismic-related ground failure, including liquefaction.

Landslides

The proposed project / proposed action would not result in significant impacts from seismically induced landslides. The proposed project / proposed action will not be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the proposed project / proposed action, potentially resulting in on- or off-site landslides or lateral spreading. The proposed project / proposed action site is located well away from the Sierra Nevada and Inyo Mountain fronts which have slopes steep enough to initiate a landslide during seismic events. Additionally, since habitable structures will not be built as part of the proposed project / proposed action, people will not be exposed to adverse effects involving landslides. Inyo County is not delineated as a seismic hazard zone, which includes areas prone to landslides by the CGS under the SHZP.[7] Therefore, the proposed project / proposed action would not result in an impact from landslides.

(2) Result in substantial soil erosion (greater than 10 percent) or the loss of topsoil?

Soil Erosion

Soil erosion occurs when surface materials are worn away from the earth's surface due to land disturbance and/or natural factors such as wind and water. The potential for soil erosion is determined by characteristics including texture and content, surface roughness, vegetation cover, and slope grade and length. Wind erosion typically occurs when fine to medium-grained non-cohesive soils are exposed to high velocity winds. Water erosion tends to occur when loose soils on moderate to steep slopes are exposed to storm events or other running water events.

Within the proposed project / proposed action study area, wind and water erosion are ongoing processes. The proposed project / proposed action would not be expected to result in significant impacts related to a substantial increase in soil erosion or loss of topsoil beyond that that occurs in the existing condition. As evidenced by stable dune systems at other locations around the edge of Owens Lake, the proposed project / proposed action is designed to produce a net increase in vegetative cover and resulting stabilization of the dunes, resulting in a net decrease in the susceptibility to wind erosion. The objective of the proposed project / proposed action is to stabilize the dunes and reduce the levels of windblown dust and prevent erosion, that are causing and contributing to exceedances of federal

[6] Bacon and Lancaster, 2012. Geomorphic Mapping of the Keeler Dunefield and Surrounding Areas Final Report. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20D%20-%20Geomorphology/Bacon%20and%20Lancaster%202012_FINAL_REPORT_Geomorphic_Mapping_of_the_Keeler_Dunefield_and_Surrounding_Areas20121114.pdf

[7] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Seismic Hazard Zonation Program. Available at: http://www.conservation.ca.gov/cgs/shzp/Pages/index.aspx

and state standards for PM_{10} air pollution. Construction activity associated with the proposed project / proposed action includes site preparation and preparation of the staging areas and temporary access routes (temporary disturbance of approximately 33.5 acres), placing the straw bales, planting the native vegetation, and watering activities. This impact is considered short-term in nature since the potential for significant impact will end after construction is finished due to the placement of straw bales and vegetation. As specified in the proposed project / proposed action description, the proposed project / proposed action will comply with all provisions of the NPDES Program administered by the California RWQCB, Lahontan Region, as they relate to avoiding impacts from storm water runoff during construction, including preparation of a SWPPP, which shall be prepared in accordance with the California State Water Resources Control Board Order No. 99-08—DWQ, NPDES General Permit No. CAS000002 (General Construction Permit) prior to the start of soil-disturbing activities. In addition, the construction contractor would be required to incorporate BMPs consistent with the guidelines provided in the *California Storm Water Quality Handbook: Construction Site Best Management Practices Manual*.[8] Therefore, the proposed project / proposed action would not result in significant impacts from soil erosion.

(3) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse

(4) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property

(5) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water

Stability of Geology and Soils / Expansive Soils

Soils that expand and contract in volume ("shrink-swell" pattern) are considered to be expansive and may cause damage to above ground structures as a result of density changes that shift overlying materials. Fine-grain clay sediments are most likely to exhibit shrink-swell patterns in response to changing moisture levels. As described above, the majority of soils in the proposed project / proposed action study area are loamy sands and alluvial gravels. These types of soils do not exhibit shrink-swell patterns and are not considered expansive soils.

The proposed project / proposed action would not result in significant impacts related to the location of the proposed project / proposed action on a geologic unit that is unstable or that would become unstable as a result of the proposed project / proposed action. The proposed project / proposed action does not include the addition of habitable structures which would be impacted by unstable geology. The proposed project / proposed action would not result in significant impacts from an unstable geology unit. The proposed project / proposed action, as described in Section 2.1.5.2, does not include plans for septic tanks or alternative waste water disposal systems; therefore, there is no impact on the ability of soils to adequately support the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.

[8] California Stormwater Quality Association. 2003. *California Stormwater Best Management Practice Handbooks: Construction*. Menlo Park, CA. Available at: http://www.cabmphandbooks.com/Documents/Construction/Section_3.pdf

4.5.3.2 ALTERNATIVE 1, DUST CONTROL MEASURES APPLIED TO 214 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / ATVS

Under Alternative 1, construction would be essentially the same as for the proposed project / proposed action (as described in Section 2.2.2). The primary difference between the alternatives would be the total number of plants and straw bales that would be transported to the project site and distributed onto a larger area (20 additional acres) of dust control. Alternative 1 would result in a greater number of plants and straw bales; hence, additional workers and equipment may be necessary to complete the alternative in the same time frame as the proposed project / proposed action. As with the proposed project / proposed action, supplemental irrigation in the first 3 years following installation of native vegetation would be completed via hauling of water in small water tanks (about 150–200 gallons) mounted on a trailer and pulled with an ATV and then irrigation would be conducted by hand through a small-diameter hose.

The potential impacts to geology and soils would be essentially the same as for the proposed project / proposed action and would be avoided and/or lessened through the incorporation of BMPs into proposed project / proposed action design.

A. Direct and Indirect Impacts

Direct and Indirect Impacts

Direct and indirect impacts to geological resources resulting from Alternative 1 are minimal. Direct impacts to soil are nearly identical to the proposed project / proposed action and include ground disturbance resulting from the planting and establishment of native vegetation, installation of temporary windbreaks (straw bales), construction of temporary access routes, and a temporary water delivery system. Indirect impacts to geology and soils include increased vehicle and foot traffic on soils.

B. CEQA Significance Determinations

Surface Fault Rupture

(1) Expose people or structures to potential substantial adverse effects, including the risk for loss, injury, or death involving:

- Rupture of a known earthquake fault, as delineated on the most recent APEFZ Map issued by the State Geologist for the area or based on other substantial evidence of a known fault
- Strong seismic ground shaking
- Seismic-related ground failure, including liquefaction
- Landslides

Alternative 1 would not be expected to result in significant impacts related to surface fault rupture. The Alternative 1 study area is not delineated by the California Geological Survey as an APEFZ[9]. There are

[9] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Alquist-Priolo Earthquake Fault Zone Maps. Available at: http://www.quake.ca.gov/gmaps/ap/ap_maps.htm

no documented fault scarps in the proposed project / proposed action study area.[10] Alternative 1 would not involve construction of any type of building; therefore, there would be no exposure of buildings or to surface fault ruptures that would expose people or structures to potential substantial adverse effects. Therefore, Alternative 1 would not be expected to result in significant impacts to geology and soils related to the risk of exposure to surface fault rupture.

Seismic Ground Shaking

Alternative 1 would not be expected to result in significant impacts from strong seismic ground shaking. The Alternative 1 study area is not delineated by the California Geological Survey as an APEFZ.[11] The Alternative 1 study area is not delineated by the California Geological Survey under the SHZP.[12] Alternative 1 does not include structures or the addition of a permanent or regular population on site. Therefore, Alternative 1 would not expose people or structures to potential substantial adverse effects related to strong seismic ground shaking.

Seismic-Related Ground Failure/Liquefaction

Alternative 1 would not be expected to result in significant impacts from seismic related ground failure, including liquefaction. Although the depth of groundwater in the Alternative 1 study area is estimated to range from more than 70 feet to less than 10 feet, the Alternative 1 study area is not delineated by the California Geological Survey under the SHZP.[13] Alternative 1 does not expose people or structures to potential substantial adverse effects involving strong seismic-related ground failure, including liquefaction. Since habitable structures will not be built as part of Alternative 1, people or structures will not be exposed to adverse effects involving seismic-related ground failure, including liquefaction.

Landslides

Alternative 1 would not result in significant impacts from seismically induced landslides. Alternative 1 will not be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the proposed project / proposed action, potentially resulting in on- or off-site landslides or lateral spreading. The Alternative 1 site is located well away from the Sierra Nevada and Inyo Mountain fronts which have slopes steep enough to initiate a landslide during seismic events. Additionally, since habitable structures would not be built as part of Alternative 1, people will not be exposed to adverse effects involving landslides. Inyo County is not delineated as a seismic hazard zone, which includes areas prone to landslides by the CGS under the SHZP.[14] Therefore, Alternative 1 would not result in an impact from landslides.

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[10] Slemmons, D.B., Vittori, E., Jayko, A.S., Carver, G.A., Bacon, S.N. 2008. *Quaternary Fault and Lineament Map of Owens Valley, Inyo County, Eastern California*. Geological Society of America. Boulder, Colorado.

[11] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Alquist-Priolo Earthquake Fault Zone Maps. Available at: http://www.quake.ca.gov/gmaps/ap/ap_maps.htm

[12] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Seismic Hazard Zonation Program. Available at: http://www.conservation.ca.gov/cgs/shzp/Pages/index.aspx

[13] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Seismic Hazard Zonation Program. Available at: http://www.conservation.ca.gov/cgs/shzp/Pages/index.aspx

[14] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Seismic Hazard Zonation Program. Available at: http://www.conservation.ca.gov/cgs/shzp/Pages/index.aspx

(2) Result in substantial soil erosion (greater than 10 percent) or the loss of topsoil

Soil Erosion

Within the Alternative 1 study area, erosion is an ongoing process. Alternative 1 would not be expected to result in significant impacts related to a substantial increase in soil erosion or loss of topsoil beyond that which occurs in the existing condition. As evidenced by stable dune systems at other locations around the edge of Owens Lake, Alternative 1 would be expected to result in a net increase in vegetative cover and stabilization of the dunes, as well as a net decrease in the susceptibility to erosion as a result of the enhanced vegetative cover. The objectives of Alternative 1 are to stabilize the dunes and reduce the levels of windblown dust and prevent erosion, which are causing and contributing to exceedances of federal and state standards for PM_{10} air pollution. Construction activity associated with Alternative 1 would result from site preparation activities including preparation of the staging areas and temporary access routes (disturbance of approximately 33.5 acres), placing the straw bales, planting the native vegetation, and watering activities. This impact is considered short-term in nature since the potential for significant impact will end after construction is finished due to the placement of straw bales and vegetation. Alternative 1 would comply with all provisions of the NPDES Program administered by the California RWQCB, Lahontan Region, as they relate to avoiding impacts from storm water runoff during construction, including preparation of a SWPPP, which shall be prepared in accordance with the California State Water Resources Control Board Order No. 99-08—DWQ, NPDES General Permit No. CAS000002 (General Construction Permit) prior to the start of soil-disturbing activities. In addition, the construction contractor would be required to incorporate BMPs consistent with the guidelines provided in the *California Storm Water Quality Handbook: Construction Site Best Management Practices Manual*.[15] Therefore, Alternative 1 would not result in significant impacts from soil erosion.

(3) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse

(4) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property

(5) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water

Stability of Geology and Soils / Expansive Soils

As previously described in this section for the proposed project / proposed action, the majority of soils in the study area, inclusive of Alternative 1, are primarily gravelly alluvium and fine to medium-grained loamy sands. These types of soils do not exhibit shrink-swell patterns and are not considered expansive soils.

Alternative 1 would not result in significant impacts related to the location of the proposed project / proposed action on a geologic unit that is unstable or that would become unstable. Alternative 1 does not include the addition of habitable structures which would be impacted by unstable geology. Alternative 1 would not result in significant impacts from an unstable geology unit. Alternative 1 does

[15] California Stormwater Quality Association. 2003. *California Stormwater Best Management Practice Handbooks: Construction*. Menlo Park, CA. Available at: http://www.cabmphandbooks.com/Documents/Construction/Section_3.pdf

not include plans for septic tanks or alternative waste water disposal systems; therefore, there is no impact on the ability of soils to adequately support the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.

4.2.3.3 Alternative 2, Dust Control Measures Applied to 197 Acres Using Irrigation Water Delivered via Water Trucks / ATVs

Alternative 2 has DCMs applied at different intensities in different areas of the Keeler Dunes, and the total acreage treated is 3 acres larger than the proposed project / proposed action (as described in Section 2.2.3). This alternative focuses on applying the highest intensity of dust control (95 percent control efficiency) across the Keeler Dunes and inter-dune sand sheet areas (170 acres), while applying less intensive controls on other inter-dune and sensitive cultural areas (27 acres at 90 percent dust control efficiency). The staging areas, access routes, construction scenario, and watering would remain the same as for the proposed project / proposed action; only the numbers of straw bales and plants and the area they are applied to would be increased by less than 3 percent due to the additional 3 acres to be treated. The construction scenario, access routes, staging areas and other design features would be largely the same as for the proposed project / proposed action although the area of impact would be 3 acres larger.

A. Direct and Indirect Impacts

Direct and indirect impacts to geological resources resulting from Alternative 2 are minimal. Direct impacts to soil are nearly identical to the proposed project / proposed action and include ground disturbance resulting from the planting and establishment of native vegetation, installation of temporary windbreaks, construction of temporary access routes, and a temporary water delivery system. Indirect impacts to geology and soils include increased vehicle and foot traffic on soils.

B. CEQA Significance Determinations

(1) Expose people or structures to potential substantial adverse effects, including the risk for loss, injury, or death involving:

- Rupture of a known earthquake fault, as delineated on the most recent APEFZ Map issued by the State Geologist for the area or based on other substantial evidence of a known fault
- Strong seismic ground shaking
- Seismic-related ground failure, including liquefaction
- Landslides

Surface Fault Rupture

Alternative 2 would not be expected to result in significant impacts related to surface fault rupture. The Alternative 2 study area is not delineated by the California Geological Survey as an APEFZ.[16] There are no recorded fault scarps in the proposed project / proposed action study area.[17] Alternative 2 would

[16] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Alquist-Priolo Earthquake Fault Zone Maps. Available at: http://www.quake.ca.gov/gmaps/ap/ap_maps.htm

[17] Slemmons, D.B., Vittori, E., Jayko, A.S., Carver, G.A., Bacon, S.N. 2008. *Quaternary Fault and Lineament Map of Owens Valley, Inyo County, Eastern California*. Geological Society of America. Boulder, Colorado.

not involve construction of any type of building; therefore, there would be no exposure of buildings or to surface fault ruptures that would expose people or structures to potential substantial adverse effects. Therefore, Alternative 2 would not be expected to result in significant impacts to geology and soils related to the risk of exposure to surface fault rupture.

Seismic Ground Shaking

Alternative 2 would not be expected to result in significant impacts from strong seismic ground shaking. The Alternative 2 study area is not delineated by the California Geological Survey as an APEFZ.[18] The Alternative 2 study area is not delineated by the California Geological Survey under the SHZP.[19] Alternative 2 does not include structures or the addition of a permanent or regular population on site. Therefore, Alternative 2 would not expose people or structures to potential substantial adverse effects related to strong seismic ground shaking.

Seismic-Related Ground Failure/Liquefaction

Alternative 2 would not be expected to result in significant impacts from seismic related ground failure, including liquefaction. Although the depth of groundwater in the Alternative 2 study area is estimated to range from more than 70 feet to less than 10 feet, the Alternative 2 study area is not delineated by the California Geological Survey under the SHZP.[20] Alternative 2 does not expose people or structures to potential substantial adverse effects involving strong seismic-related ground failure, including liquefaction. Since habitable structures would not be built as part of Alternative 2, people or structures will not be exposed to adverse effects involving seismic-related ground failure, including liquefaction.

Landslides

Alternative 2 would not result in significant impacts from seismically induced landslides. Alternative 2 will not be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the proposed project / proposed action, potentially resulting in on- or off-site landslides or lateral spreading. The Alternative 2 site is located well away from the Sierra Nevada and Inyo Mountain fronts, which have slopes steep enough to initiate a landslide during seismic events. Additionally, since habitable structures would not be built as part of Alternative 2, people would not be exposed to adverse effects involving landslides. Inyo County is not delineated as a seismic hazard zone, which includes areas prone to landslides by the CGS under the SHZP.[21] Therefore, Alternative 2 would not result in an impact from landslides.

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[18] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Alquist-Priolo Earthquake Fault Zone Maps. Available at: http://www.quake.ca.gov/gmaps/ap/ap_maps.htm

[19] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Seismic Hazard Zonation Program. Available at: http://www.conservation.ca.gov/cgs/shzp/Pages/index.aspx

[20] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Seismic Hazard Zonation Program. Available at: http://www.conservation.ca.gov/cgs/shzp/Pages/index.aspx

[21] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Seismic Hazard Zonation Program. Available at: http://www.conservation.ca.gov/cgs/shzp/Pages/index.aspx

(2) Result in substantial soil erosion (greater than 10 percent) or the loss of topsoil

Soil Erosion

Within the Alternative 2 study area, erosion is an ongoing process. Alternative 2 would not be expected to result in significant impacts related to a substantial increase in soil erosion or loss of topsoil beyond that which occurs in the existing condition. As evidenced by stable dune systems at other locations around the edge of Owens Lake, Alternative 2 would be expected to result in a net increase in vegetative cover and stabilization of the dunes, as well as a net decrease in the susceptibility to erosion as a result of the enhanced vegetative cover. The objective of Alternative 2 is to stabilize the dunes in order to reduce the levels of windblown dust and prevent erosion, which are causing and contributing to exceedances of federal and state standards for PM_{10} air pollution. Construction activity associated with Alternative 2 would result from site preparation activities including preparation of the staging areas and temporary access routes (disturbance of approximately 33.5 acres), placing the straw bales, planting the native vegetation, and watering activities. This impact is considered short-term in nature since the potential for significant impact will end after construction is finished due to the placement of straw bales and vegetation. Alternative 2 will comply with all provisions of the NPDES Program administered by the California RWQCB, Lahontan Region, as they relate to avoiding impacts from storm water runoff during construction, including preparation of a SWPPP, which shall be prepared in accordance with the California State Water Resources Control Board Order No. 99-08—DWQ, NPDES General Permit No. CAS000002 (General Construction Permit) prior to the start of soil-disturbing activities. In addition, the construction contractor would be required to incorporate BMPs consistent with the guidelines provided in the *California Storm Water Quality Handbook: Construction Site Best Management Practices Manual*.[22] Therefore, Alternative 2 would not result in significant impacts from soil erosion.

(3) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse

(4) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property

(5) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water

Stability of Geology and Soils / Expansive Soils

As previously described in this section, the majority of soils in the Alternative 2 study area are primarily gravelly alluvium and fine to medium-grained loamy sands. These types of soils do not exhibit shrink-swell patterns and are not considered expansive soils.

Alternative 2 would not result in significant impacts related to the location of the proposed project / proposed action on a geologic unit that is unstable or that would become unstable. Alternative 2 does not include the addition of habitable structures which would be impacted by unstable geology. Alternative 2 would not result in significant impacts from an unstable geology unit. Alternative 2 does not include plans for septic tanks or alternative waste water disposal systems; therefore, there is no

[22] California Stormwater Quality Association. 2003. *California Stormwater Best Management Practice Handbooks: Construction*. Menlo Park, CA. Available at: http://www.cabmphandbooks.com/Documents/Construction/Section_3.pdf

impact on the ability of soils to adequately support the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.

4.5.3.4 Alternative 3, Dust Control Measures Applied to 194 Acres Using Irrigation Water Delivered via Water Trucks / Tanks / PVC Irrigation System and Selected Manual Watering

Under Alternative 3, the DCMs would be the same as the proposed project / proposed action (as described in Section 2.2.4). Water obtained from the District's production well at the Fault Test site would be transported to the proposed project / proposed action via large water trucks to temporary storage tanks located at the three of the four designated staging areas. Since the staging areas are lower in elevation than the proposed project / proposed action area, each staging area would need to have a manifold and booster pump to pressurize the irrigation system. The use of water tanks mounted on ATVs, to distribute supplemental irrigation during the operations and maintenance phase, would be replaced with a temporary aboveground irrigation system that would be installed within the 95 percent control level area to provide water to the project area. Plants within the sensitive 85 percent control area would be manually watered using the same method as the proposed project / proposed action. In the environmentally sensitive areas, the ATV-mounted tanks would be filled with water from the delivery system within the proposed project / proposed action instead of from trucks at the staging areas.

The potential impacts to geology and soils would be essentially the same as for the proposed project / proposed action and would be avoided and/or lessened through the incorporation of BMPs into proposed project / proposed action design.

A. Direct and Indirect Impacts

Direct and indirect impacts to geological resources resulting from Alternative 3 are minimal. Direct impacts to soil are nearly identical to the proposed project / proposed action and include ground disturbance resulting from the planting and establishment of native vegetation, installation of temporary windbreaks, construction of temporary access routes, and a temporary irrigation system. Indirect impacts to geology and soils include increased vehicle and foot traffic on soils. However, the incorporation of an irrigation system would result in less ATV and foot traffic.

B. CEQA Significance Determinations

(1) Expose people or structures to potential substantial adverse effects, including the risk for loss, injury, or death involving:

- Rupture of a known earthquake fault, as delineated on the most recent APEFZ Map issued by the State Geologist for the area or based on other substantial evidence of a known fault
- Strong seismic ground shaking
- Seismic-related ground failure, including liquefaction
- Landslides

Surface Fault Rupture

Alternative 3 would not be expected to result in significant impacts related to surface fault rupture. The Alternative 3 study area is not delineated by the California Geological Survey as an APEFZ.[23] There are no recorded fault scarps in the proposed project / proposed action study area.[24] Alternative 3 would not involve construction of any type of building; therefore, there would be no exposure of buildings or to surface fault ruptures that would expose people or structures to potential substantial adverse effects. Therefore, Alternative3 would not be expected to result in significant impacts to geology and soils related to the risk of exposure to surface fault rupture.

Seismic Ground Shaking

Alternative 3 would not be expected to result in significant impacts from strong seismic ground shaking. The Alternative 3 study area is not delineated by the California Geological Survey as an APEFZ.[25] The Alternative 3 study area is not delineated by the California Geological Survey under the SHZP.[26] Alternative 3 does not include structures or the addition of a permanent or regular population on site. Therefore, Alternative 3 would not expose people or structures to potential substantial adverse effects related to strong seismic ground shaking.

Seismic-Related Ground Failure/Liquefaction

Alternative 3 would not be expected to result in significant impacts from seismic related ground failure, including liquefaction. Although the depth of groundwater in the Alternative 3 study area is estimated to range from more than 70 feet to less than 10 feet, the Alternative 3 study area is not delineated by the California Geological Survey under the SHZP.[27] Alternative 3 does not expose people or structures to potential substantial adverse effects involving strong seismic-related ground failure, including liquefaction. Since habitable structures would not be built as part of Alternative 3, people or structures would not be exposed to adverse effects involving seismic-related ground failure, including liquefaction.

Landslides

Alternative 3 would not result in significant impacts from seismically induced landslides. Alternative 3 would not be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the proposed project / proposed action, potentially resulting in on- or off-site landslides or lateral spreading. The Alternative 3 site is located well away from the Sierra Nevada and Inyo Mountain fronts which have slopes steep enough to initiate a landslide during seismic events. Additionally, since habitable structures would not be built as part of Alternative 3, people would not be exposed to adverse effects involving landslides. Inyo County is not delineated as a seismic hazard

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[23] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Alquist-Priolo Earthquake Fault Zone Maps. Available at: http://www.quake.ca.gov/gmaps/ap/ap_maps.htm

[24] Slemmons, D.B., Vittori, E., Jayko, A.S., Carver, G.A., Bacon, S.N. 2008. *Quaternary Fault and Lineament Map of Owens Valley, Inyo County, Eastern California*. Geological Society of America. Boulder, Colorado.

[25] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Alquist-Priolo Earthquake Fault Zone Maps. Available at: http://www.quake.ca.gov/gmaps/ap/ap_maps.htm

[26] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Seismic Hazard Zonation Program. Available at: http://www.conservation.ca.gov/cgs/shzp/Pages/index.aspx

[27] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Seismic Hazard Zonation Program. Available at: http://www.conservation.ca.gov/cgs/shzp/Pages/index.aspx

zone, which includes areas prone to landslides by the CGS under the SHZP.[28] Therefore, Alternative 3 would not result in an impact from landslides.

(2) Result in substantial soil erosion (greater than 10 percent) or the loss of topsoil

Soil Erosion

Within the Alternative 3 study area, erosion is an ongoing process. Alternative 3 would not be expected to result in significant impacts related to a substantial increase in soil erosion or loss of topsoil beyond that which occurs in the existing condition. As evidenced by stable dune systems at other locations around the edge of Owens Lake, Alternative 3 would be expected to result in a net increase in vegetative cover and stabilization of the dunes, as well as a net decrease in the susceptibility to erosion as a result of the enhanced vegetative cover. The objective of Alternative 3 is to stabilize the dunes in order to reduce the levels of windblown dust and prevent erosion, that are causing and contributing to exceedances of federal and state standards for PM_{10} air pollution. Construction activity associated with Alternative 3 would result from site preparation activities including preparation of the staging areas and temporary access routes (disturbance of approximately 33.5 acres), placing the straw bales, planting the native vegetation, and watering activities. This impact is considered short-term in nature since the potential for significant impact would end after construction is finished due to the placement of straw bales and vegetation. Alternative 3 would comply with all provisions of the NPDES Program administered by the California RWQCB, Lahontan Region, as they relate to avoiding impacts from storm water runoff during construction, including preparation of a SWPPP, which shall be prepared in accordance with the California State Water Resources Control Board Order No. 99-08—DWQ, NPDES General Permit No. CAS000002 (General Construction Permit) prior to the start of soil-disturbing activities. In addition, the construction contractor would be required to incorporate BMPs consistent with the guidelines provided in the *California Storm Water Quality Handbook: Construction Site Best Management Practices Manual*.[29] Therefore, Alternative 3 would not result in significant impacts from soil erosion.

(3) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse

(4) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property

(5) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water

Stability of Geology and Soils / Expansive Soils

As previously described in this section fir the proposed project / proposed action study area, the majority of soils in the Alternative 3 study area are primarily gravelly alluvium and fine to medium-grained loamy sands. These types of soils do not exhibit shrink-swell patterns and are not considered expansive soils.

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[28] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Seismic Hazard Zonation Program. Available at: http://www.conservation.ca.gov/cgs/shzp/Pages/index.aspx

[29] California Stormwater Quality Association. 2003. *California Stormwater Best Management Practice Handbooks: Construction*. Menlo Park, CA. Available at: http://www.cabmphandbooks.com/Documents/Construction/Section_3.pdf

Alternative 3 would not result in significant impacts related to the location of the proposed project / proposed action on a geologic unit that is unstable or that would become unstable. Alternative 3 does not include the addition of habitable structures which would be impacted by unstable geology. Alternative 3 would not result in significant impacts from an unstable geology unit. Alternative 3 does not include plans for septic tanks or alternative waste water disposal systems; therefore, there is no impact on the ability of soils to adequately support the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.

4.5.3.5 ALTERNATIVE 4, DUST CONTROL MEASURES APPLIED TO 194 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / PVC IRRIGATION SYSTEM AND SELECTED MANUAL WATERING

Under Alternative 4, the DCMs would be the same as the proposed project / proposed action (as described in Section 2.2.5). In Alternative 4, water obtained from the Fault Test Well would be transported to the proposed project / proposed action via water trucks, and the water delivery system would be fed from three supply points along SR 136. As with Alternative 3, plants within the 95 percent control area would be watered with hoses attached to the laterals of the temporary PVC irrigation system. In this alternative, water trucks would stage next to the highway and deliver water directly into the temporary PVC irrigation system, rather than utilizing water tanks at the staging areas for temporary storage. As in Alternative 3, hand watering would be done in the sensitive 85 percent control area using hoses to deliver water from tanks mounted on ATVs, staged in a manner to avoid sensitive cultural resources. As with the temporary irrigation system, the ATV-mounted tanks would be filled with water from the delivery system within the proposed project / proposed action instead of from tanks at the staging areas.

The potential impacts to geology and soils would be essentially the same as for the proposed project / proposed action and would be avoided and/or lessened through the incorporation of BMPs into proposed project / proposed action design. Further details of Alternative 4 are described in Section 2.2.5.

A. Direct and Indirect Impacts

Direct and indirect impacts to geological resources resulting from Alternative 4 are minimal. Direct impacts to soil are nearly identical to the proposed project / proposed action and include ground disturbance resulting from the planting and establishment of native vegetation, installation of temporary windbreaks, construction of temporary access routes, and a temporary irrigation system. Indirect impacts to geology and soils include increased vehicle and foot traffic on soils. However, the incorporation of an irrigation system would require 80 percent less ATV traffic, and thus would result in less temporary disturbance of the dunes during the operations and maintenance phase of Alternative 4 than that anticipated for the proposed project / proposed action.

B. CEQA Significance Determinations

(1) Expose people or structures to potential substantial adverse effects, including the risk for loss, injury, or death involving:

- Rupture of a known earthquake fault, as delineated on the most recent APEFZ Map issued by the State Geologist for the area or based on other substantial evidence of a known fault
- Strong seismic ground shaking
- Seismic-related ground failure, including liquefaction
- Landslides

Surface Fault Rupture

Alternative 4 would not be expected to result in significant impacts related to surface fault rupture. The Alternative 4 study area is not delineated by the California Geological Survey as an APEFZ.[30] There are no recorded fault scarps in the proposed project / proposed action study area.[31] Alternative 4 would not involve construction of any type of building; therefore, there would be no exposure of buildings or to surface fault ruptures that would expose people or structures to potential substantial adverse effects. Therefore, Alternative4 would not be expected to result in significant impacts to geology and soils related to the risk of exposure to surface fault rupture.

Seismic Ground Shaking

Alternative 4 would not be expected to result in significant impacts from strong seismic ground shaking. The Alternative 4 study area is not delineated by the California Geological Survey as an APEFZ.[32] The Alternative 4 study area is not delineated by the California Geological Survey under the SHZP.[33] Alternative 4 does not include structures or the addition of a permanent or regular population on site. Therefore, Alternative 4 would not expose people or structures to potential substantial adverse effects related to strong seismic ground shaking.

Seismic-Related Ground Failure/Liquefaction

Alternative 4 would not be expected to result in significant impacts from seismic related ground failure, including liquefaction. Although the depth of groundwater in the Alternative 4 study area is estimated to range from more than 70 feet to less than 10 feet, the Alternative 4 study area is not delineated by the California Geological Survey under the SHZP.[34] Alternative 4 does not expose people or structures to potential substantial adverse effects involving strong seismic-related ground failure, including liquefaction. Since habitable structures would not be built as part of Alternative 4, people or structures would not be exposed to adverse effects involving seismic-related ground failure, including liquefaction.

[30] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Alquist-Priolo Earthquake Fault Zone Maps. Available at: http://www.quake.ca.gov/gmaps/ap/ap_maps.htm

[31] Slemmons, D.B., Vittori, E., Jayko, A.S., Carver, G.A., Bacon, S.N. 2008. *Quaternary Fault and Lineament Map of Owens Valley, Inyo County, Eastern California*. Geological Society of America. Boulder, Colorado.

[32] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Alquist-Priolo Earthquake Fault Zone Maps. Available at: http://www.quake.ca.gov/gmaps/ap/ap_maps.htm

[33] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Seismic Hazard Zonation Program. Available at: http://www.conservation.ca.gov/cgs/shzp/Pages/index.aspx

[34] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Seismic Hazard Zonation Program. Available at: http://www.conservation.ca.gov/cgs/shzp/Pages/index.aspx

Landslides

Alternative 4 would not result in significant impacts from seismically induced landslides. Alternative 4 would not be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the proposed project / proposed action, potentially resulting in on- or off-site landslides or lateral spreading. The Alternative 4 site is located well away from the Sierra Nevada and Inyo Mountain fronts which have slopes steep enough to initiate a landslide during seismic events. Additionally, since habitable structures would not be built as part of Alternative 4, people would not be exposed to adverse effects involving landslides. Inyo County is not delineated as a seismic hazard zone, which includes areas prone to landslides by the CGS under the SHZP.[35] Therefore, Alternative 4 would not result in an impact from landslides.

(2) Result in substantial soil erosion (greater than 10 percent) or the loss of topsoil

Soil Erosion

Within the Alternative 4 study area, erosion is an ongoing process. Alternative 4 would not be expected to result in significant impacts related to a substantial increase in soil erosion or loss of topsoil beyond that which occurs in the existing condition. As evidenced by stable dune systems at other locations around the edge of Owens Lake, Alternative 4 would be expected to result in a net increase in vegetative cover and stabilization of the dunes, as well as a net decrease in the susceptibility to erosion as a result of the enhanced vegetative cover. The objective of Alternative 4 is to stabilize the dunes in order to reduce the levels of windblown dust and prevent erosion, which are causing and contributing to exceedances of federal and state standards for PM_{10} air pollution. Construction activity associated with Alternative 4 would result from site preparation activities including preparation of the staging areas and temporary access routes (disturbance of approximately 33.5 acres), placing the straw bales, planting the native vegetation, and watering activities. This impact is considered short-term in nature since the potential for significant impact would end after construction is finished due to the placement of straw bales and vegetation. Alternative 4 would comply with all provisions of the NPDES Program administered by the California RWQCB, Lahontan Region, as they relate to avoiding impacts from storm water runoff during construction, including preparation of a SWPPP, which shall be prepared in accordance with the California State Water Resources Control Board Order No. 99-08—DWQ, NPDES General Permit No. CAS000002 (General Construction Permit) prior to the start of soil-disturbing activities. In addition, the construction contractor would be required to incorporate BMPs consistent with the guidelines provided in the *California Storm Water Quality Handbook: Construction Site Best Management Practices Manual*.[36] Therefore, Alternative 2 would not result in significant impacts from soil erosion.

(3) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse

(4) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property

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[35] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Seismic Hazard Zonation Program. Available at: http://www.conservation.ca.gov/cgs/shzp/Pages/index.aspx

[36] California Stormwater Quality Association. 2003. *California Stormwater Best Management Practice Handbooks: Construction*. Menlo Park, CA. Available at: http://www.cabmphandbooks.com/Documents/Construction/Section_3.pdf

(5) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water

Stability of Geology and Soils / Expansive Soils

As previously described in this section for the proposed project / proposed action, the majority of soils in the Alternative 4 study area are primarily gravelly alluvium and fine to medium-grained loamy sands. These types of soils do not exhibit shrink-swell patterns and are not considered expansive soils.

Alternative 4 would not result in significant impacts related to the location of the proposed project / proposed action on a geologic unit that is unstable or that would become unstable. Alternative 4 does not include the addition of habitable structures which would be impacted by unstable geology. Alternative 4 would not result in significant impacts from an unstable geology unit. Alternative 4 does not include plans for septic tanks or alternative waste water disposal systems; therefore, there is no impact on the ability of soils to adequately support the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.

4.5.3.6 ALTERNATIVE 5, DUST CONTROL MEASURES APPLIED TO 194 ACRES USING IRRIGATION WATER DELIVERED VIA KCSD WATER WELL / PIPELINE TO IRRIGATION SYSTEM AND SELECTED MANUAL WATERING

Under Alternative 5, the DCMs would be the same as the proposed project / proposed action. In Alternative 5, water obtained from the KCSD well would be transported to the proposed project / proposed action via a temporary pipeline that connects into the KCSD water system near the KCSD well site. Water would be supplied directly to the temporary irrigation system from the KCSD, in lieu of the District's Fault Test Well. As with Alternatives 3 and 4, Alternative 5 would include a temporary aboveground irrigation system installed within the 95 percent control level area. Plants within the 85 percent control area would be watered by hand using the same method as described above. The ATV-mounted tanks would be filled with water from the delivery system within the proposed project / proposed action.

A. Direct and Indirect Impacts

Direct and indirect impacts to geological resources resulting from Alternative 5 are minimal. Direct impacts to soil are nearly identical to the proposed project / proposed action and include ground disturbance resulting from the planting and establishment of native vegetation, installation of temporary wind breaks, construction of temporary access routes, and a temporary irrigation system. Indirect impacts to geology and soils include increased vehicle and foot traffic on soils. However, the incorporation of an irrigation system would require 80 percent less ATV traffic, and thus would result in less temporary disturbance of the dunes during the operations and maintenance phase of Alternative 5 than that anticipated for the proposed project / proposed action.

B. CEQA Significance Determinations

(1) Expose people or structures to potential substantial adverse effects, including the risk for loss, injury, or death involving:

- Rupture of a known earthquake fault, as delineated on the most recent APEFZ Map issued by the State Geologist for the area or based on other substantial evidence of a known fault
- Strong seismic ground shaking
- Seismic-related ground failure, including liquefaction
- Landslides

Surface Fault Rupture

Alternative 5 would not be expected to result in significant impacts related to surface fault rupture. The Alternative 5 study area is not delineated by the California Geological Survey as an APEFZ.[37] There are no recorded fault scarps in the proposed project / proposed action study area.[38] Alternative 5 would not involve construction of any type of building; therefore, there would be no exposure of buildings or to surface fault ruptures that would expose people or structures to potential substantial adverse effects. Therefore, Alternative3 would not be expected to result in significant impacts to geology and soils related to the risk of exposure to surface fault rupture.

Seismic Ground Shaking

Alternative 5 would not be expected to result in significant impacts from strong seismic ground shaking. The Alternative 5 study area is not delineated by the California Geological Survey as an APEFZ.[39] The Alternative 5 study area is not delineated by the California Geological Survey under the SHZP.[40] Alternative 5 does not include structures or the addition of a permanent or regular population on site. Therefore, Alternative 5 would not expose people or structures to potential substantial adverse effects related to strong seismic ground shaking.

Seismic-Related Ground Failure/Liquefaction

Alternative 5 would not be expected to result in significant impacts from seismic related ground failure, including liquefaction. Although the depth of groundwater in the Alternative 5 study area is estimated to range from more than 70 feet to less than 10 feet, the Alternative 5 study area is not delineated by the California Geological Survey under the SHZP.[41] Alternative 5 does not expose people or structures to potential substantial adverse effects involving strong seismic-related ground failure, including liquefaction. Since habitable structures would not be built as part of Alternative 5, people or structures would not be exposed to adverse effects involving seismic-related ground failure, including liquefaction.

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[37] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Alquist-Priolo Earthquake Fault Zone Maps. Available at: http://www.quake.ca.gov/gmaps/ap/ap_maps.htm

[38] Slemmons, D.B., Vittori, E., Jayko, A.S., Carver, G.A., Bacon, S.N. 2008. *Quaternary Fault and Lineament Map of Owens Valley, Inyo County, Eastern California*. Geological Society of America. Boulder, Colorado.

[39] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Alquist-Priolo Earthquake Fault Zone Maps. Available at: http://www.quake.ca.gov/gmaps/ap/ap_maps.htm

[40] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Seismic Hazard Zonation Program. Available at: http://www.conservation.ca.gov/cgs/shzp/Pages/index.aspx

[41] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Seismic Hazard Zonation Program. Available at: http://www.conservation.ca.gov/cgs/shzp/Pages/index.aspx

Landslides

Alternative 5 would not result in significant impacts from seismically induced landslides. Alternative 5 would not be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the proposed project / proposed action, potentially resulting in on- or off-site landslides or lateral spreading. The Alternative 5 site is located well away from the Sierra Nevada and Inyo Mountain fronts which have slopes steep enough to initiate a landslide during seismic events. Additionally, since habitable structures would not be built as part of Alternative 5, people would not be exposed to adverse effects involving landslides. Inyo County is not delineated as a seismic hazard zone, which includes areas prone to landslides by the CGS under the SHZP.[42] Therefore, Alternative 5 would not result in an impact from landslides.

(2) Result in substantial soil erosion (greater than 10 percent) or the loss of topsoil

Soil Erosion

Within the Alternative 5 study area, erosion is an ongoing process. Alternative 5 would not be expected to result in significant impacts related to a substantial increase in soil erosion or loss of topsoil beyond that which occurs in the existing condition. As evidenced by stable dune systems at other locations around the edge of Owens Lake, Alternative 5 would be expected to result in a net increase in vegetative cover and stabilization of the dunes, as well as a net decrease in the susceptibility to erosion as a result of the enhanced vegetative cover. The objective of Alternative 5 is to stabilize the dunes in order to reduce the levels of windblown dust and prevent erosion, which are causing and contributing to exceedances of federal and state standards for PM_{10} air pollution. Construction activity associated with Alternative 5 would result from site preparation activities including preparation of the staging areas and temporary access routes (disturbance of approximately 33.5 acres), placing the straw bales, planting the native vegetation, and watering activities. This impact is considered short-term in nature since the potential for significant impact would end after construction is finished due to the placement of straw bales and vegetation. Alternative 5 would be required to comply with the provisions of the NPDES Program administered by the California RWQCB, Lahontan Region, as they relate to avoiding impacts from storm water runoff during construction, including preparation of a SWPPP, which shall be prepared in accordance with the California State Water Resources Control Board Order No. 99-08—DWQ, NPDES General Permit No. CAS000002 (General Construction Permit) prior to the start of soil-disturbing activities. In addition, the construction contractor would be required to incorporate BMPs consistent with the guidelines provided in the *California Storm Water Quality Handbook: Construction Site Best Management Practices Manual*.[43] Therefore, Alternative 5 would not result in significant impacts from soil erosion.

(3) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse

(4) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property

[42] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Seismic Hazard Zonation Program. Available at: http://www.conservation.ca.gov/cgs/shzp/Pages/index.aspx

[43] California Stormwater Quality Association. 2003. *California Stormwater Best Management Practice Handbooks: Construction*. Menlo Park, CA. Available at: http://www.cabmphandbooks.com/Documents/Construction/Section_3.pdf

(5) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water

Stability of Geology and Soils / Expansive Soils

As previously described in this section, the majority of soils in the Alternative 5 study area are primarily gravelly alluvium and fine to medium-grained loamy sands. These types of soils do not exhibit shrink-swell patterns and are not considered expansive soils.

Alternative 5 would not result in significant impacts related to the location of the proposed project / proposed action on a geologic unit that is unstable or that would become unstable. Alternative 5 does not include the addition of habitable structures which would be impacted by unstable geology. Alternative 5 would not result in significant impacts from an unstable geology unit. Alternative 5 does not include plans for septic tanks or alternative waste water disposal systems; therefore, there is no impact on the ability of soils to adequately support the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.

4.5.3.7 ALTERNATIVE 6, NO PROJECT / NO ACTION ALTERNATIVE

Alternative 6, No Project / No Action, assumes that the DMCs would not be implemented on the proposed project / proposed action site, and windblown dust and associated PM_{10} emissions would continue to pose a health hazard to the residents of the communities of Keeler and Swansea. Under Alternative 6, the NAAQS and California state standards for PM_{10} would continue to be exceeded in violation of the 2008 SIP. The sand dunes on the proposed project / proposed action site would continue to migrate to the south-southeast toward the community of Keeler, and natural resources within the dunes would continue to be affected by the shifting sands resulting from high wind events.

4.5.4 MITIGATION MEASURES

The proposed project / proposed action would incorporate BMPs consistent with the guidelines in the *California Storm Water Quality Handbook: Construction Site Best Management Practices Manual* that would reduce or eliminate impacts from water erosion. In addition, an NOI and SWPPP shall be prepared in accordance with the General Construction Permit prior to the start of soil-disturbing activities. The proposed project / proposed action does not include new construction or renovation. All activities and development on the proposed project / proposed action site would be subject to uniform site development and construction standards that are designed to protect public safety. Therefore, impacts related to geology and seismic hazards would be less than significant and no mitigation measures are required.

4.4.5 RESIDUAL IMPACTS AFTER MITIGATION

The proposed project / proposed action and alternatives do not involve the installation of buildings or structures; therefore there would be no exposure of people or structures to potential adverse risks from seismic ground shaking. The proposed project / proposed action is not located in an APEFZ and, therefore, would not be expected to be exposed to severe ground shaking. Although the depth of groundwater in the proposed project / proposed action study area is estimated to range from more than 70 feet to less than 10 feet, the proposed project / proposed action study area is not delineated by the

California Geological Survey under the SHZP.[44] Inyo County is not delineated as a seismic hazard zone, which includes areas prone to landslides by the CGS under the SHZP.[45] As specified in the proposed project / proposed action description, the proposed project / proposed action will comply with all provisions of the NPDES Program administered by the California RWQCB, Lahontan Region, as they relate to avoiding impacts from storm water runoff during construction, including preparation of a SWPPP, which shall be prepared in accordance with the General Construction Permit prior to the start of soil-disturbing activities. In addition, the construction contractor would be required to incorporate BMPs consistent with the guidelines provided in the *California Storm Water Quality Handbook: Construction Site Best Management Practices Manual*.[46] Therefore, the proposed project / proposed action would not result in significant impacts from soil erosion.

[44] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Seismic Hazard Zonation Program. Available at: http://www.conservation.ca.gov/cgs/shzp/Pages/index.aspx

[45] California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Seismic Hazard Zonation Program. Available at: http://www.conservation.ca.gov/cgs/shzp/Pages/index.aspx

[46] California Stormwater Quality Association. 2003. *California Stormwater Best Management Practice Handbooks: Construction*. Menlo Park, CA. Available at: http://www.cabmphandbooks.com/Documents/Construction/Section_3.pdf

4.6 PALEONTOLOGICAL RESOURCES

This section examines the possible effects that could result from the proposed project / proposed action and alternatives. The analysis is based on the Paleontological Survey Report for the Keeler Dunes Project, Owens Lake, Inyo County, California[1] (hereafter Survey Report) and supplemental paleontological surveys provided in the Cultural Resources Technical Report, which is included as Appendix F of this document. The Survey Report summarizes existing paleontological resource data in the proposed project / proposed action study area and vicinity as identified through literature review and archival records and supplemented by observations recorded during a field survey of the proposed project / proposed action study area. Due to the confidential nature of the location of paleontological resources, this section does not include maps or location descriptions.

4.6.1 STUDY METHODS

4.6.1.1 LITERATURE REVIEW

As described in Section 3.6.2.4, the potential for paleontological resources within the proposed project / proposed action study area was assessed using data obtained from record searches at the NHMLAC[2] and the SBCM.[3] The NHMLAC and the SBCM conducted thorough searches of their respective paleontology collection records for the locality and specimen data for the proposed project / proposed action study area. A detailed geomorphic map of Keeler Dunes was also reviewed to identify the geologic units that underlay the proposed project / proposed action study area.[4]

4.6.1.2 SURVEY

A pedestrian paleontological survey was conducted by qualified paleontologists on July 23, 2013, and February 20, 2014.[5,6] The field survey focused on examining those portions of the APE that encompassed the staging areas and temporary access routes, as these locales were expected to be subject to some ground disturbance. The primary goal of the field work was to inspect the study area for surface fossils and exposures of potentially fossil-bearing geologic units and to determine areas in which fossil-bearing geologic units could be exposed during project-related ground disturbances.

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[1] SWCA Environmental Consultants. August 2013. *Paleontological Survey Report for the Keeler Dunes Project, Owens Lake, Inyo County, California*. Prepared for Sapphos Environmental, Inc. Pasadena, CA.

[2] McLeod, Samuel, Natural History Museum of Los Angeles County, Los Angeles, CA. 11 October 2011. Letter response to Clarus Backes, Sapphos Environmental, Inc., Pasadena, CA.

[3] Scott, Eric, San Bernardino County Museum, Redlands, CA. 28 February 2012. Letter response to Tiffany Clark, Sapphos Environmental, Inc., Pasadena, CA.

[4] Bacon and Lancaster, 2012. Geomorphic Mapping of the Keeler Dunefield and Surrounding Areas Final Report. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20D%20-%20Geomorphology/Bacon%20and%20Lancaster%202012_FINAL_REPORT_Geomorphic_Mapping_of_the_Keeler_Dunefield_and_Surrounding_Areas20121114.pdf

[5] SWCA Environmental Consultants. August 2013. *Paleontological Survey Report for the Keeler Dunes Project, Owens Lake, Inyo County, California*. Prepared for Sapphos Environmental, Inc. Pasadena, CA.

[6] Sapphos Environmental, Inc. February 2014. *Keeler Dunes Dust Control Project Cultural Resources Technical Report*. Prepared for the Bureau of Land Management, Bishop Field Office.

4.6.2 CEQA SIGNIFICANCE CRITERIA / NEPA REQUIREMENTS

For purposes of the analysis, the CEQA Significance Determinations and NEPA Requirements are discussed concurrently where applicable (i.e. with regard to CEQA Guidelines criterion). For NEPA disclosure, the impact analysis is referring to the proposed project / proposed action or an alternative. Direct effects (or impacts) are those occurring in the same place and time as the proposed project / proposed action with regard to construction and maintenance. Direct paleontological resource impacts from the proposed project / proposed action or an alternative are related to disturbance or damage to paleontological resources during construction and maintenance. Indirect effects (or impacts) are those that could result from the proposed project / proposed action or an alternative, but are later in time (for example after the construction and maintenance phase) or further removed in distance (for example, several miles from the proposed project / proposed action site).

4.6.2.1 CEQA SIGNIFICANCE CRITERIA

For the purposes of this EIR/EA, a significant paleontological resources impact under CEQA would occur if implementation of the proposed project / proposed action would:

(1) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

Paleontologically sensitive sedimentary units are those units with a high potential for containing significant paleontological resources (i.e., rock units within which vertebrate fossils or significant invertebrate fossils have been determined by previous studies to be present or likely to be present). These units include, but are not limited to, sedimentary formations that contain significant paleontological resources anywhere within their geographical extent as well as sedimentary rock units temporally or lithologically suitable for the preservation of fossils.

Determinations of paleontological sensitivity must consider not only the potential for yielding abundant vertebrate fossils but also the potential for production of a few significant fossils, large or small, vertebrate or invertebrate, which may provide new and significant data on fossils types, species changes over time, or geologic strata. Areas that may contain datable organic remains older than the recent era and areas that may contain unique new vertebrate deposits, traces, and/or trackways must also be considered paleontologically sensitive.

Fossils can be considered to be of significant scientific interest if any of the following criteria apply:

- The fossils provide data on evolutionary relationships and developmental trends among organisms, both living and extinct.
- The fossils provide data useful in determining the age(s) of the rock unit or sedimentary stratum, including data important in determining the depositional history of the region and the timing of geologic events therein.
- The fossils provide data regarding the development of biological communities or interaction between paleobotanical and paleozoological biotas.
- The fossils demonstrate unusual or spectacular circumstances in the history of life.
- The fossils are in short supply and/or in danger of being depleted or destroyed by the elements, vandalism, or commercial exploitation and are not found in other geographic locations.

4.6.2.2 NEPA Requirements

The CEQA Criteria identified above also serve to fulfill the NEPA Requirement of a basis for analysis to evaluate potential impacts to paleontological resources associated with the proposed project / proposed action and alternatives.

4.6.3 Environmental Consequences

4.6.3.1 Proposed Project / Proposed Action, Dust Control Measures Applied to 194 Acres Using Irrigation Water Delivered via Water Trucks / ATVs

The proposed project / proposed action will entail the establishment and management of native vegetation and the use of straw bales as temporary windbreaks positioned within an area of approximately 194 acres in order to control PM_{10} dust emissions. Other project elements consist of infrastructure elements including a temporary access routes, temporary staging area for equipment and materials storage, and an effectiveness monitoring program (existing air monitoring sites). Water delivery to the site would be accomplished by water trucks transporting water from the District's Fault Test Well to the staging areas. Water would be loaded into small water tanks (about 150–200 gallons) mounted on a trailer and pulled with an ATV and then irrigation would be conducted by hand through a small-diameter hoses. Further details of the proposed project / proposed action are described in Section 2.1, *Proposed Project / Proposed Action*.

A. Direct and Indirect Impacts

Direct and indirect impacts to paleontological resources resulting from the proposed project / proposed action would be expected to be minimal. Straw bales placement and the planting and establishment of native vegetation will be conducted with minimal ground disturbance from vehicle and foot traffic in the immediate area and would be implemented on modern active sand deposits that have a minimum potential for containing paleontological resources. These disturbances are expected to disturb the ground surface and uppermost layers of soil only. Direct impacts from the preparation of four staging areas may result from minimal disturbance of the ground surface for each staging area. Indirect impacts from staging area preparation may result from increased vehicle and foot traffic.

B. CEQA Significance Determinations

Would the proposed project:

(1) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

The proposed project / proposed action would not be expected to result in significant impacts related directly or indirectly to the destruction of a unique paleontological resource or unique geologic feature. The proposed project / proposed action area is located within an area of surficial aeolian sediments consisting of active sand sheets and sand dunes interspersed with smaller surficial deposits of Quaternary alluvium. Given that the geologic units within the proposed project / proposed action area exhibit a Class 2 – Low sensitivity, the placement of straw bales and the use of temporary access routes as well as shallow excavations associated with the planting of vegetation would have little potential of encountering fossil remains.

A small portion of the proposed project / proposed action area, which includes Staging Areas 1 and 2 and the central and southern access routes, is situated within Class 2 – Low sensitivity surficial aeolian sediments consisting of active sand sheets and sand dunes interspersed with smaller surficial deposits of quaternary alluvium that overlay Class 4 – High sensitivity lacustrine sediments. However, due to shifting nature of the dune sands, some portions of the proposed project / proposed action may have Class 4 – High sensitivity lacustrine sediments at shallow depths, less than one foot. The proposed project / proposed action is not anticipated to result in significant impacts to these geological deposits.

4.6.3.2 ALTERNATIVE 1, DUST CONTROL MEASURES APPLIED TO 214 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / ATVS

Under Alternative 1, construction would be essentially the same as for the proposed project / proposed action (as described in Section 2.2.2). The primary difference between the alternatives would be the total number of plants and straw bales that would be transported to the project site and distributed onto a larger area (20 additional acres) of dust control. Alternative 1 would result in a greater number of plants and straw bales; hence, additional workers and equipment may be necessary to complete the alternative in the same time frame as the proposed project / proposed action. As with the proposed project / proposed action, supplemental irrigation in the first 3 years following installation of native vegetation would be completed via hauling of water in small water tanks (about 150–200 gallons) mounted on a trailer and pulled with an ATV and then irrigation would be conducted by hand through a small-diameter hose.

A. Direct and Indirect Impacts

Construction and operation of Alternative 1 would be much the same as the proposed project / proposed action but would require the placement of a greater number of plants and straw bales distributed over a larger area. The paleontological resources potentially affected by Alternative 1 are the same as those that would be potentially affected by the proposed project / proposed action (see Section 4.6.3.1).

B. CEQA Significance Determinations

Would Alternative 1:

(1) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Alternative 1 would not be expected to result in significant impacts related directly or indirectly to the destruction of a unique paleontological resource. Like the proposed project / proposed action, the majority of Alternative 1 is located within Class 2 – Low sensitivity surficial aeolian sediments consisting of active sand sheets and sand dunes interspersed with smaller surficial deposits of quaternary alluvium that overlay Class 4 – High sensitivity lacustrine sediments. However, construction activities within this area and associated with Alternative 1 would be expected to be minimal, with ground disturbance limited to brushing and grubbing of vegetation. Therefore, the implementation of Alternative 1 would not be anticipated to result in significant impacts to these geological deposits and associated paleontological resources.

4.6.3.3 Alternative 2, Dust Control Measures Applied to 197 Acres Using Irrigation Water Delivered via Water Trucks / ATVs

Alternative 2 has DCMs applied at different intensities in different areas of the Keeler Dunes, and the total acreage treated is 3 acres larger than the proposed project / proposed action (as described in Section 2.2.3). This alternative focuses on applying the highest intensity of dust control (95 percent control efficiency) across the Keeler Dunes and inter-dune sand sheet areas (170 acres), while applying less intensive controls on other inter-dune and sensitive cultural areas (27 acres at 90 percent dust control efficiency). The staging areas, access routes, construction scenario, and watering would remain the same as for the proposed project / proposed action; only the numbers of straw bales and plants and the area they are applied to would be increased by less than 3 percent due to the additional 3 acres to be treated. The construction scenario, access routes, staging areas and other design features would be largely the same as for the proposed project / proposed action although the area of impact would be 3 acres larger.

A. Direct and Indirect Impacts

Construction and operation of Alternative 2 would be much the same as the proposed project / proposed action but would require the placement of a greater number of plants and straw bales distributed over a larger area. The paleontological resources potentially affected by Alternative 2 are the same as those that would be potentially affected by the proposed project / proposed action (see Section 4.6.3.1).

B. CEQA Significance Determinations

Would Alternative 2:

(1) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Alternative 2 would not be expected to result in significant impacts related directly or indirectly to the destruction of a unique paleontological resource or unique geologic feature. Like the proposed project / proposed action, the majority of Alternative 2 is located within Class 2 – Low sensitivity surficial aeolian sediments consisting of active sand sheets and sand dunes interspersed with smaller surficial deposits of quaternary alluvium that overlay Class 4 – High sensitivity lacustrine sediments. However construction activities within this area and associated with Alternative 2 are expected to be minimal, with ground disturbance limited to clearing and grubbing of vegetation. Therefore, the implementation of Alternative 2 would not be anticipated to result in significant impacts to these geological deposits and associated paleontological resources.

4.6.3.4 Alternative 3, Dust Control Measures Applied to 194 Acres Using Irrigation Water Delivered via Water Trucks / Tanks / PVC Irrigation System and Selected Manual Watering

Under Alternative 3, the DCMs would be the same as the proposed project / proposed action (as described in Section 2.2.4). Water obtained from the District's production well at the Fault Test site would be transported to the proposed project / proposed action via large water trucks to temporary storage tanks located at the three of the four designated staging areas. Since the staging areas are lower in elevation than the proposed project / proposed action area, each staging area would need to have a manifold and booster pump to pressurize the irrigation system. The use of water tanks mounted on ATVs, to distribute supplemental irrigation during the operations and maintenance phase, would be replaced with a temporary aboveground irrigation system that would be installed within the 95 percent control level area to provide water to the project area. Plants within the sensitive 85 percent control area would be manually watered using the same method as the proposed project / proposed action. In the environmentally sensitive areas, the ATV-mounted tanks would be filled with water from the delivery system within the proposed project / proposed action instead of from trucks at the staging areas.

A. Direct and Indirect Impacts

Construction and operation of Alternative 3 would be much the same as the proposed project / proposed action but would require the installation of an irrigation system (with the exception of environmentally sensitive areas) to limit travel in the dunes for watering plants within the first 3 years. The use of the temporary irrigation system to deliver supplemental irrigation water would reduce ATV trips by approximately 80 percent during the operation and maintenance phase of Alternative 3. The paleontological resources potentially affected by Alternative 3 are the same as those that would be potentially affected by the proposed project / proposed action.

B. CEQA Significance Determinations

Would Alternative 3:

(1) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Alternative 3 would not be expected to result in significant impacts related directly or indirectly to the destruction of a unique paleontological resource or unique geologic feature. Like the proposed project / proposed action, the majority of Alternative 3 is located within Class 2 – Low sensitivity surficial aeolian sediments consisting of active sand sheets and sand dunes interspersed with smaller surficial deposits of quaternary alluvium that overlay Class 4 – High sensitivity lacustrine sediments. However, construction activities within this area and associated with Alternative 3 would be expected to be minimal, with ground disturbance limited to clearing and brushing of vegetation. Therefore, the implementation of Alternative 3 would not be expected to result in significant impacts to these geological deposits and associated paleontological resources.

4.6.3.5 ALTERNATIVE 4, DUST CONTROL MEASURES APPLIED TO 194 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / PVC IRRIGATION SYSTEM AND SELECTED MANUAL WATERING

Under Alternative 4, the DCMs would be the same as the proposed project / proposed action (as described in Section 2.2.5). In Alternative 4, water obtained from the Fault Test Well would be transported to the proposed project / proposed action via water trucks, and the water delivery system would be fed from three supply points along SR 136. As with Alternative 3, plants within the 95 percent control area would be watered with hoses attached to the laterals of the temporary PVC irrigation system. In this alternative, water trucks would stage next to the highway and deliver water directly into the temporary PVC irrigation system, rather than utilizing water tanks at the staging areas for temporary storage. As in Alternative 3, hand watering would be done in the sensitive 85 percent control area using hoses to deliver water from tanks mounted on ATVs, staged in a manner to avoid sensitive cultural resources. As with the temporary irrigation system, the ATV-mounted tanks would be filled with water from the delivery system within the proposed project / proposed action instead of from tanks at the staging areas.

A. Direct and Indirect Impacts

Construction and operation of Alternative 4 would be much the same as the proposed project / proposed action but would include a combination of hand watering and installation of a temporary irrigation system to limit travel in the dunes for watering plants within the first 3 years following revegetation. The use of the temporary irrigation system to deliver supplemental irrigation water would reduce ATV trips by approximately 80 percent during the operation and maintenance phase of Alternative 4. The paleontological resources potentially affected by Alternative 4 are the same as those that would be potentially affected by the proposed project / proposed action.

B. CEQA Significance Determinations

Would Alternative 4:

(1) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Alternative 4 would not be expected to result in significant impacts related directly or indirectly to the destruction of a unique paleontological resource or unique geologic feature. Like the proposed project / proposed action, the majority of Alternative 4 is located within Class 2 – Low sensitivity surficial aeolian sediments consisting of active sand sheets and sand dunes interspersed with smaller surficial deposits of quaternary alluvium that overlay Class 4 – High sensitivity lacustrine sediments. However, construction activities within this area and associated with Alternative 4 are expected to be minimal, with ground disturbance limited to clearing and grubbing of vegetation. Therefore, the implementation of Alternative 4 would not be anticipated to result in significant impacts to these geological deposits and associated paleontological resources.

4.6.3.6 ALTERNATIVE 5, DUST CONTROL MEASURES APPLIED TO 194 ACRES USING IRRIGATION WATER DELIVERED VIA KCSD WATER WELL / PIPELINE TO IRRIGATION SYSTEM AND SELECTED MANUAL WATERING

Under Alternative 5, the DCMs would be the same as the proposed project / proposed action. In Alternative 5, water obtained from the KCSD well would be transported to the proposed project / proposed action via a temporary pipeline that connects into the KCSD water system near the KCSD well site. Water would be supplied directly to the temporary irrigation system from the KCSD, in lieu of the District's Fault Test Well. As with Alternatives 3 and 4, Alternative 5 would include a temporary aboveground irrigation system installed within the 95 percent control level area. Plants within the 85 percent control area would be watered by hand using the same method as described above. The ATV-mounted tanks would be filled with water from the delivery system within the proposed project / proposed action.

A. Direct and Indirect Impacts

Construction and operation of Alternative 5 would be much the same as the proposed project / proposed action but would include a combination of hand watering and installation of a temporary irrigation system via a pipeline connection from the KCSD well for the first 3 years. The paleontological resources potentially affected by Alternative 5 are the same as those that would be potentially affected by the proposed project / proposed action.

B. CEQA Significance Determinations

Would Alternative 5:

(1) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Alternative 5 would not be expected to result in significant impacts related directly or indirectly to the destruction of a unique paleontological resource or unique geologic feature. Like the proposed project / proposed action, the majority of Alternative 5 is located within Class 2 – Low sensitivity surficial aeolian sediments consisting of active sand sheets and sand dunes interspersed with smaller surficial deposits of quaternary alluvium that overlay Class 4 – High sensitivity lacustrine sediments. However, construction activities within this area and associated with Alternative 5 are expected to be minimal, with ground disturbance limited to clearing and grubbing of vegetation. Therefore, the implementation of Alternative 5 would not be anticipated to result in significant impacts to these geological deposits associated paleontological resources.

4.6.2.7 ALTERNATIVE 6, NO PROJECT / NO ACTION ALTERNATIVE

Alternative 6, No Project / No Action, assumes that the DMCs would not be implemented on the proposed project / proposed action site, and windblown dust and associated PM_{10} emissions would continue to pose a health hazard to the residents of the communities of Keeler and Swansea. Under Alternative 6, the NAAQS and California state standards for PM_{10} would continue to be exceeded in violation of the 2008 SIP. The sand dunes on the proposed project / proposed action site would continue to migrate to the south-southeast toward the community of Keeler, and natural resources within the dunes would continue to be affected by the shifting sands resulting from high wind events.

A. Direct and Indirect Impacts

Under Alternative 6, there would be no installation or maintenance activities; therefore, there would be no potential for direct or indirect impacts to paleontological resources.

B. CEQA Significance Determinations

Under Alternative 6, there would be no effect to paleontological resources.

4.6.4 MITIGATION MEASURES

Implementation of the proposed project / proposed action or alternatives would not be expected to result in significant impacts to paleontological resources; therefore, mitigation measures would not be required.

4.6.5 RESIDUAL IMPACTS AFTER MITIGATION

There would be no anticipated significant impacts to paleontological resources under the proposed project / proposed action or alternatives.

4.7 GREENHOUSE GAS EMISSIONS AND GLOBAL CLIMATE CHANGE

Potential greenhouse gas (GHG) emission impacts of the proposed Keeler Dunes Dust Control Project (proposed project / proposed action) have been carried forward for detailed analysis in this Environmental Impact Report (EIR). This analysis was undertaken to identify opportunities to avoid, reduce, or otherwise mitigate potential significant impacts to GHG emissions and identify potential alternatives. Information contained in this section is summarized from the Air Quality and Greenhouse Gases Technical Report (Appendix C, *Air Quality and Greenhouse Gas Emissions Technical Report*).

4.7.1 STUDY METHODS

To quantify the amount of GHG emissions contributed by construction and operation of the proposed project / proposed action, the CalEEMod emissions model and the California Climate Action Registry's General Reporting Protocol were used. The proposed project / proposed action would be expected to have the potential to result in significant impacts related to global climate change if the proposed project / proposed action conflicts with the goal of reducing California's GHG emissions to the 1990 levels (427 million metric tons CO_{2e}, which is equivalent to approximately 10 tons CO_{2e} per capita) by 2020 as required by AB 32. Based on the suggested thresholds proposed by the CAPCOA[1], the proposed project / proposed action would be expected to have the potential to result in significant impacts related to global climate change if the proposed project / proposed action emits more than 25,000 metric tons of CO_{2e} per year.

In order to establish a reference point for future GHG emissions, CO_{2e} emissions have been projected based on an unregulated, business as usual, GHG emissions scenario that does not consider the reductions in GHG emissions required by Executive Order S-3-05 or AB 32. CARB has stated that California contributed 427 million metric tons of GHG emissions in CO_{2e} in 1990 and under a business as usual development scenario, will contribute approximately 596 million metric tons of CO_{2e} emissions in 2020, which presents a linear upward trend in California's total GHG emissions. To characterize the business as usual GHG emissions specifically for Inyo County, information on population has been collected from the California Department of Finance. It has been projected that the population of Inyo County will increase by approximately 24 percent from 2010 to 2050.[2] Using the current CO_{2e} emissions factor of 14 metric tons *per capita*,[3] Inyo County would be responsible for the emission of approximately 0.26 million metric ton of CO_{2e} in 2010 and 0.32 million metric tons of CO_{2e} in 2050 under a business as usual emissions scenario (Table 4.7.1-1, *Characterization of Business As Usual GHG Emissions for Inyo County*).

[1] California Air Pollution Control Officers Association. January 2008. CEQA and Climate Change *and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act*. Sacramento, CA. Voluntary Reporting of Greenhouse Gases, U.S. Department of Energy, Energy Information Administration (16 pp, 111K, About PDF)

[2] California Department of Finance. January 2013. *State and County Population Projections by County, by Race/Ethnicity, and by Major Age Groups, 2010-2060 (by decade)*. Available at: http://www.dof.ca.gov/research/demographic/reports/projections/view.php

[3] California Air Resources Board. 15 October 2008. *Climate Change Proposed Scoping Plan: A Framework for Change*. Available at: http://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm

TABLE 4.7.1-1
CHARACTERIZATION OF BUSINESS AS USUAL GHG EMISSIONS FOR INYO COUNTY

	Year						
	1990	**2000**	**2010**	**2020**	**2030**	**2040**	**2050**
Population	18,281	17,945	18,528	19,350	20,428	22,009	23,053
CARB emission factor (metric tons of CO_{2e} *per capita*)	14	14	14	14	14	14	14
Annual GHG emissions for Inyo County (million metric tons of CO_{2e})	0.26	0.25	0.26	0.27	0.29	0.31	0.32

Sources:
California Department of Finance. January 2013. *State and County Population Projections by County, by Race/Ethnicity, and by Major Age Groups, 2010-2060 (by decade)*. Available at: http://www.dof.ca.gov/research/demographic/reports/projections/view.php

California Department of Finance. August 2011. *Historic Census Populations of Counties and Incorporated Cities in California 1850-2010*. Available at: http://www.dof.ca.gov/research/demographic/state_census_data_center/historical_census_1850-2010/view.php

A. CalEEMod Model

The California Emissions Estimator Model (CalEEMod 2013.2.2) was used to estimate construction emissions from preparation of the staging areas and temporary access routes, delivery and placement of straw bales, delivery and placement of native plants, and the periodic watering of plants. CalEEMod is a computer program that can be used to estimate emissions associated with land development projects in California such as residential neighborhoods, shopping centers, and office buildings; area sources such as gas appliances, wood stoves, fireplaces, and landscape maintenance equipment; and construction projects. The CalEEMod, version 2013.2.2, emissions model directly calculates criteria pollutant emissions, as well as GHG (CH_4 and N_2O and CO_2) emissions. The proposed project / proposed action property lacks an industrial component that would be considered a Pb emission source, so the concentrations and emissions of Pb were not analyzed for the proposed project / proposed action. The analysis of construction impacts to GHG emissions is based on the construction scenario for the proposed project / proposed action.

B. Short-term Greenhouse Gas Emissions Inputs

The proposed project / proposed action would include the placement of approximately 124,000 straw bales and 370,000 native plants on the approximately 194-acre proposed project / proposed action property. Seven factors were taken in to consideration, in emission modeling undertaken with the CalEEMod, version 2013.2.2l:

1. Total construction would take a maximum of 11 months.

2. The construction activities undertaken would be as follows:

Month 1:	Site preparation
Months 1–7:	Distribute straw bales on sand dunes
Months 2–11:	Planting and watering
Month 11:	Clean up and restoration

3. All disturbance during the site preparation phase would be temporary.

4. Following construction, supplemental monitoring and watering would occur from 2015–2018. This would include watering, as needed, in late winter / early spring and late summer / early fall.

5. The climate zone was set to 12 and the wind speed was set to 3.8 meters per second.

6. 95 percent of worker trips were assumed to occur on unpaved roads.

7. Default parameters, such as the horsepower and the load factor, were used for all construction equipment anticipated to be used for the proposed project / proposed action.

C. Long-Term Greenhouse Gas Emissions and Potential Savings

Annual GHG emissions and the potential reduction in PM_{10} associated with operation of the proposed project / proposed action were quantified using CalEEMod, version 2013.2.2. Consistent with the results of the pilot study, plant establishment was assumed to be 66 percent successful, the proposed project / proposed action would generate a net CO_2 benefit and reduce PM_{10} emissions by as much as 95 percent. The potential GHG emissions from construction and maintenance of the proposed project / proposed action were calculated by using the CalEEMod model (Appendix B of the Air Quality and Greenhouse Gas Emissions Technical Report).

4.7.2 CEQA SIGNIFICANCE CRITERIA / NEPA REQUIREMENTS

For purposes of the analysis, the CEQA Significance Determinations and NEPA Requirements are discussed concurrently where applicable (i.e. with regard to CEQA Guidelines criterion). For NEPA disclosure, the impact analysis is referring to the proposed project / proposed action or an Alternative. Direct natural resource impacts from the proposed project / proposed action or an alternative are related to GHG emissions (e.g. pollutant generated during operation of construction equipment and vehicle trips) generated during construction and maintenance. Indirect effects (or impacts) are those that could result from the proposed project / proposed action or an alternative, but are later in time (for example after construction and maintenance) or further removed in distance (for example, several miles from the project site).

4.7.2.1 CEQA SIGNIFICANCE CRITERIA

State CEQA Guidelines recommend the consideration of two questions when addressing the potential for significant impacts to GHG emissions.

Would the proposed project have any of the following effects:

(1) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; and/or

(2) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs

Great Basin Unified Air Pollution Control District Quality Impact Assessment Screening Thresholds

The OVPA is currently classified non-attainment for PM_{10} and classified attainment for O_3, CO, Pb, NO_x, $PM_{2.5}$, and SO_2. The District is required to comply with the emission thresholds for all federally regulated air pollutants. The proposed project / proposed action would have a potentially significant impact if it does the following:

- The proposed project / proposed action is not consistent with adopted federal or state Air Quality Attainment Plans
- The proposed project / proposed action emits annual rates that equal or exceed 25,000 metric tons of CO_2 equivalence as a result of operations (U.S. EPA Mandatory Reporting of GHG Rule).

The California Air Pollution Controls Officers Association (CAPCOA) has discussed several approaches to consider the potential cumulative significance of projects with respect to GHGs.[4] A zero-threshold approach can be considered based on the concept that climate change is a global phenomenon and all GHG emissions generated throughout the Earth contribute to climate change. However, State CEQA Guidelines also recognize that there may be a point at which a project's contribution, although above zero, to the cumulative impact would not be considerable (State CEQA Guidelines, Section 15130 [a]). Therefore, a threshold of greater than zero is considered more appropriate for the analysis of GHG emissions under CEQA. The CAPCOA's summary of suggested thresholds for GHG emissions includes efficiency-based thresholds, quantitative emission limits, and limits on the size of projects (Table 4.7.2.1-1, *CAPCOA-Suggested Thresholds for Greenhouse Gases*).

For the purposes of the analysis presented in this document, the suggested reporting threshold of 25,000 metric tons CO_{2e} per year will be used as a quantitative threshold to assist with determining significance. The reporting threshold was selected because it corresponds to the threshold set by the U.S. EPA for the Mandatory Reporting of GHG Rule.

[4] California Air Pollution Control Officers Association. January 2008. *CEQA and Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act.* Sacramento, CA.

TABLE 4.7.2.1-1
CAPCOA-SUGGESTED THRESHOLDS FOR GREENHOUSE GASES

Description	Suggested Threshold
Quantitative (900 tons)	Approximately 900 metric tons CO_{2e}/year for residential, office, and non-office commercial projects
Quantitative CARB reporting threshold / cap and trade	Report: 25,000 metric tons CO_{2e}/year Cap and trade: 10,000 metric tons CO_{2e}/year
Quantitative regulated inventory capture	Approximately 40,000 to 50,000 metric tons CO_{2e}/year
Unit-based threshold based on market capture	Commercial space > 50,000 square feet
Projects of statewide, regional, or area wide significance	Residential development > 500 units Shopping center/business establishment > 500,000 square feet Commercial office space > 250,000 square feet Industrial park > 600,000 square feet

Source:
California Air Pollution Control Officers Association. January 2008. *CEQA and Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act.* Sacramento, CA.

4.7.2.2 NEPA REQUIREMENTS

The Council on Environmental Quality (CEQ) *Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions*[5] proposed that if a proposed project / proposed action would be reasonably anticipated to cause direct emissions of 25,000 metric tons or more of CO_{2e} GHG emission on an annual basis, agencies should consider this an indicator that a quantitative and qualitative assessment may be meaningful to decision makers and the public. While the guidance is in draft form, this indicator of 25,000 metric tons or more of CO_{2e} GHG emissions on an annual basis can still serve as a useful benchmark against which to compare a proposed action's expected GHG emissions. Each alternative is evaluated against this number in the NEPA analysis.

4.7.2.3 ISSUES SCOPED OUT AS PART OF INITIAL STUDY

Potential GHG emission impacts that could occur from the implementation of the proposed project / proposed action generally fall into four major categories:

1. Construction impacts: construction impacts associated with the proposed project / proposed action will be limited to temporary impacts from airborne dust emitted by ATVs during the placement of straw bales on the site, planting native vegetation, and preparation of staging areas.

2. Operational Impacts: operational impacts associated with the proposed project / proposed action will be limited to airborne dust emitted by ATVs during maintenance activities.

3. Operational Local Impacts: increases in pollutant concentrations, primarily CO, would be limited due to the fact that the proposed project / proposed action would not result

[5] Council on Environmental Quality, *Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions*. Memorandum for Heads of Federal Departments and Agencies. 18 February 2010. Available at: http://ceq.hss.doe.gov/nepa/regs/Consideration_of_Effects_of_GHG_Draft_NEPA_Guidance_FINAL_02182010.pdf

in significant traffic increases in the immediate vicinity of a project, as well as any toxic and odor emissions generated on-site.

4. Cumulative Impacts: GHG changes that result from the incremental impact of the proposed project / proposed action when added to other projects in the vicinity.

4.7.3 ENVIRONMENTAL CONSEQUENCES

4.7.3.1 PROPOSED PROJECT / PROPOSED ACTION, DUST CONTROL MEASURES APPLIED TO 194 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / ATVS

A. Direct and Indirect Impacts

The proposed project / proposed action is a program to control dust emissions in the Keeler Dunes through the use of native plants and temporary windbreaks (straw bales). The key components of the proposed project / proposed action include placement of straw bales on the site, planting of native vegetation, preparation of staging areas, access routes, water supply, conveyance and distribution and an effectiveness monitoring program as part of the operations phase of the project. Further details of the proposed project / proposed action are described in Section 2.2.1, *Proposed Action and Alternatives*.

Qualitative Analysis

The proposed project / proposed action's incremental impact to GHG emissions would be potentially significant if the size, nature, or duration of the construction phase would emit a substantial amount of GHGs. The construction phase of the proposed project / proposed action would take approximately 11 months to complete and would potentially include the 194-acre proposed project / proposed action property. However, there are inter-dune areas within the project project/ proposed act area that will not need to be controlled. During delivery of straw bales and planting, heavy-duty equipment would be operated, which, together with the size of the area under construction, would be expected to produce significant, but temporary, GHG emissions. Therefore, the GHG emissions due to the proposed project / proposed action's straw bale delivery and planting phases warrant a quantitative analysis.

During the operational phase, the proposed project / proposed action's GHG emissions would be expected to be below the level of significance. As described in the project description (see Section 2.0), the proposed project / proposed action is primarily the placement of straw bales and the planting of vegetation. Therefore, although the use of maintenance equipment for the proposed project / proposed action would be expected to emit GHGs, the operational phase would be expected to result in a net decrease in regional GHG emissions due to the establishment of native vegetation as well as a reduction of PM_{10} emissions. Operation of the proposed project / proposed action would not be expected to have a significant detrimental impact upon GHG emissions and would reduce GHG emissions in compliance with the goals of AB 32 by providing an additional sink for CO_{2e}, which would reduce GHG emissions compared to a business as usual scenario.

Quantitative Analysis

Based on emissions modeling, construction activities would result in the emission of a maximum of approximately 3,668.47 metric tons of CO_{2e} per year (Table 4.7.3.1-1, *CO_2 and CO_{2e} Emissions*). Operation of the proposed project / proposed action would result in the emission of approximately 2,696.38 metric tons of CO_{2e} per year. The operational GHG emissions can be attributed to mobile sources, particularly the use of water trucks during the maintenance phase of the proposed project / proposed action. However, it is anticipated that impacts to GHG emissions associated with operation of the proposed project / proposed action would be greatly reduced due to sequestration of approximately 836.14 metric tons of CO_{2e} per year by the native plants (Appendix C). Therefore, the overall operation of the proposed project / proposed action would be expected to have a less than significant impact on GHG emissions; would not trigger the reference point of 25,000 metric tons of direct CO_{2e} that would warrant detailed consideration in the NEPA review set forth in the draft Guidance by CEQ; would not exceed the CAPCOA reporting threshold of 25,000 metric tons per year and would reduce GHG emissions in compliance with AB 32. Therefore, it is expected that the overall GHG emissions resulting from construction and operation of the proposed project / proposed action would be consistent with CEQ's guidance and would be below the level of significance.

TABLE 4.7.3.1-1
CO_2 AND CO_{2E} EMISSIONS

Construction Emission Sourced*	CO_2 Emissions	CO_{2e} Emissions
	Metric Tons/Year	**Metric Tons/Year**
Maximum Construction Emissions	**3,645.93**	**3,668.47**
Operational Emission Sources**	**Metric Tons/Year**	**Metric Tons/Year**
Operational Activity	1,856.42	1,868.06
ATVs	3.18	3.19
Water Trucks	818.58	823.71
Mobile Sources	1.41	1.42
Maximum Operational Emissions	**2,679.59**	**2,696.38**

Note: * Construction-related emissions are anticipated to last for up to 11 months.
** Operation-related emissions are anticipated to last for up to 3 years.

B. CEQA Significance Determinations

Would the proposed project:

(1) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

The proposed project would not result in a significant impact on the environment through the generation of GHG emissions. With the exception of minor emissions associated with construction activities, the proposed project would reduce GHG emissions through sequestration of GHG by the native plants.

(2) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs?

The proposed project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. As mentioned above, the proposed project would reduce GHG emissions in compliance with the goals of AB 32.

4.7.3.2 Alternative 1, Dust Control Measures Applied to 214 Acres Using Irrigation Water Delivered via Water Trucks / ATVs

Under Alternative 1, construction would be essentially the same as for the proposed project / proposed action (as described in Section 2.2.2). The primary difference between the alternatives would be the total number of plants and straw bales that would be transported to the project site and distributed onto a larger area (20 additional acres) of dust control. Alternative 1 would result in a greater number of plants and straw bales; hence, additional workers and equipment may be necessary to complete the alternative in the same time frame as the proposed project / proposed action. As with the proposed project / proposed action, supplemental irrigation in the first 3 years following installation of native vegetation would be completed via hauling of water in small water tanks (about 150–200 gallons) mounted on a trailer and pulled with an ATV and then irrigation would be conducted by hand through a small diameter hose.

A. Direct and Indirect Impacts

The GHG emission impact would be the similar to the proposed project / proposed action (Table 4.7.3.2-1, *CO_2 and CO_{2e} Emissions for Alternative 1*), as a result of the comparable construction scenario, access routes, staging areas, and other design features. The ten percent increase in area treated with dust control measures does not substantially increase emissions of CO_2 or CO_{2e}.

Table 4.7.3.2-1
CO_2 and CO_{2e} Emissions for Alternative 1

Construction Emission Sourced*	CO_2 Emissions	CO_{2e} Emissions
	Metric Tons/Year	Metric Tons/Year
Maximum Construction Emissions	**3,645.93**	**3,668.47**
Operational Emission Sources**	**Metric Tons/Year**	**Metric Tons/Year**
Operational Activity	1,856.42	1,868.06
ATVs	3.18	3.19
Water Trucks	818.58	823.71
Mobile Sources	1.41	1.42
Maximum Operational Emissions	**2,679.59**	**2,696.38**

NOTE: * Construction-related emissions are anticipated to last for up to 11 months.
** Operation-related emissions are anticipated to last for up to 3 years.

B. CEQA Significance Determinations

Would Alternative 1:

(1) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

Alternative 1 would not result in a significant impact on the environment through the generation of GHG emissions. With the exception of minor emissions associated with construction activities, Alternative 1 would provide a reduction of GHG emissions through the sequestration of GHG by the native plants.

(2) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs?

Alternative 1 would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. As mentioned above, Alternative 1 would reduce GHG emissions in compliance with the goals of AB 32.

4.7.3.3 Alternative 2, Dust Control Measures Applied to 197 Acres Using Irrigation Water Delivered via Water Trucks / ATVs

Alternative 2 has DCMs applied at different intensities in different areas of the Keeler Dunes, and the total acreage treated is 3 acres larger than the proposed project / proposed action (as described in Section 2.2.3) This alternative focuses on applying the highest intensity of dust control (95 percent control efficiency) across the Keeler Dunes and inter-dune sand sheet areas (170 acres), while applying less intensive controls on other inter-dune and sensitive cultural areas (27 acres at 90 percent dust control efficiency). The staging areas, access routes, construction scenario, and watering would remain the same as for the proposed project / proposed action; only the numbers of straw bales and plants and the area they are applied to would be increased by less than 3 percent due to the additional 3 acres to be treated. The construction scenario, access routes, staging areas and other design features would be largely the same as for the proposed project / proposed action although the area of impact would be 3 acres larger.

A. Direct and Indirect Impacts

Therefore, the GHG emission impacts would be similar to the proposed project / proposed action (Table 4.7.3.3-1, *CO_2 and CO_{2e} Emissions for Alternative 2*).

TABLE 4.7.3.3-1
CO_2 AND CO_{2E} EMISSIONS FOR ALTERNATIVE 2

Construction Emission Sourced*	CO_2 Emissions	CO_{2e} Emissions
	Metric Tons/Year	Metric Tons/Year
Maximum Construction Emissions	**3,645.93**	**3,668.47**
Operational Emission Sources**	**Metric Tons/Year**	**Metric Tons/Year**
Operational Activity	1,856.42	1,868.06
ATVs	3.18	3.19
Water Trucks	818.58	823.71
Mobile Sources	1.41	1.42
Maximum Operational Emissions	**2,679.59**	**2,696.38**

NOTE: * Construction-related emissions are anticipated to last for up to 11 months.
** Operation-related emissions are anticipated to last for up to 3 years.

B. CEQA Significance Determinations

Would Alternative 2:

(1) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

Alternative 2 would not result in a significant impact on the environment through the generation of GHG emissions. With the exception of minor emissions associated with construction activities, Alternative 2 would provide reduction in GHG emissions through sequestration of GHG by the native plants.

(2) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs?

Alternative 2 would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. As mentioned above, Alternative 2 would reduce GHG emissions in compliance with the goals of AB 32.

4.7.3.4 ALTERNATIVE 3, DUST CONTROL MEASURES APPLIED TO 194 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / TANKS / PVC IRRIGATION SYSTEM AND SELECTED MANUAL WATERING

Under Alternative 3, the DCMs would be the same as the proposed project / proposed action (as described in Section 2.2.4). Water obtained from the District's production well at the Fault Test site would be transported to the project via large water trucks to temporary storage tanks located at the three of the four designated staging areas. Since the staging areas are lower in elevation than the project area, each staging area would need to have a manifold and booster pump to pressurize the irrigation system. The use of water tanks mounted on ATVs, to distribute supplemental irrigation during the operations and maintenance phase of the project, would be replaced with a temporary aboveground irrigation system that would be installed within the 95 percent control level area to provide water to the project area. Plants within the sensitive 85 percent control area would be manually watered using the same method as described proposed project / proposed action. In the environmentally sensitive areas, the ATV mounted tanks would be filled with water from the delivery system within the project instead of from trucks at the staging areas.

A. Direct and Indirect Impacts

Due to the addition of an irrigation system, the GHG emissions analysis for Alternative 3 includes an additional construction phase for the construction of the irrigation system. With the exception of the irrigation system, the construction scenario, access routes, staging areas and other design features would be largely the same as the proposed project / proposed action. Therefore, the GHG emission impact would be the similar to the proposed project / proposed action (Table 4.7.3.4-1, *CO_2 and CO_{2e} Emissions for Alternative 3*).

TABLE 4.7.3.4-1
CO_2 AND CO_{2E} EMISSIONS FOR ALTERNATIVE 3

Construction Emission Sourced*	CO_2 Emissions	CO_{2e} Emissions
	Metric Tons/Year	Metric Tons/Year
Maximum Construction Emissions	**3,892.05**	**3,916.12**
Operational Emission Sources**	**Metric Tons/Year**	**Metric Tons/Year**
Operational Activity	1,856.42	1,868.06
ATVs	0.42	0.42
Water Trucks	818.58	823.71
Mobile Sources	1.41	1.42
Maximum Operational Emissions	**2,676.83**	**2,693.61**

NOTE: * Construction-related emissions are anticipated to last for up to 11 months.
** Operation-related emissions are anticipated to last for up to 3 years.

B. CEQA Significance Determinations

Would Alternative 3:

(1) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

Alternative 3 would not result in a significant impact on the environment through the generation of GHG emissions. With the exception of minor emissions associated with construction activities, Alternative 3 would provide a reduction of GHG emissions through the sequestration of GHG by the native plants.

(2) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs?

Alternative 3 would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. As mentioned above, Alternative 3 would reduce GHG emissions in compliance with the goals of AB 32.

4.7.3.5 ALTERNATIVE 4, DUST CONTROL MEASURES APPLIED TO 194 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / PVC IRRIGATION SYSTEM AND SELECTED MANUAL WATERING

Under Alternative 4, the DCMs would be the same as the proposed project / proposed action (as described in Section 2.25). In Alternative 4, water obtained from the Fault Test Well would be transported to the project via water trucks and the water delivery system would be fed from three supply points along State Route 136. As with Alternative 3, plants within the 95 percent control area would be watered with hoses attached to the laterals of the temporary PVC irrigation system. In this alternative, water trucks would stage next to the highway and deliver water directly in to the temporary PVC irrigation system, rather than utilizing water tanks at the staging areas for temporary storage. As in Alternative 3, hand watering would be done in approximately 8 percent of the dust control area using hoses to deliver water from tanks mounted on ATVs, stage in a manner to avoid sensitive cultural resources. As with the temporary irrigation system, the ATV mounted tanks would be filled with water from the delivery system within the project instead of from tanks at the staging areas.

A. Direct and Indirect Impacts

Due to the addition of an irrigation system in Alternative 4, the GHG emissions analysis for Alternative 4 includes an additional construction phase for the construction of the irrigation system. With the exception of the irrigation system, the construction scenario, access routes, staging areas and other design features would be largely the same as the proposed project / proposed action. Therefore, the GHG emission impact would be the similar to the proposed project / proposed action (Table 4.7.3.5-1, *CO_2 and CO_{2e} Emissions for Alternative 4)*.

TABLE 4.7.3.5-1
CO_2 AND CO_{2E} EMISSIONS FOR ALTERNATIVE 4

Construction Emission Sourced*	CO_2 Emissions	CO_{2e} Emissions
	Metric Tons/Year	Metric Tons/Year
Maximum Construction Emissions	**3,892.05**	**3,916.12**
Operational Emission Sources**	**Metric Tons/Year**	**Metric Tons/Year**
Operational Activity	1,856.42	1,868.06
ATVs	0.42	0.42
Water Trucks	818.58	823.71
Mobile Sources	1.41	1.42
Maximum Operational Emissions	**2,676.83**	**2,693.61**

NOTE: * Construction-related emissions are anticipated to last for up to 11 months.
** Operation-related emissions are anticipated to last for up to 3 years.

B. CEQA Significance Determinations

Would Alternative 4:

(1) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

Alternative 4 would not result in a significant impact on the environment through the generation of GHG emissions. With the exception of minor emissions associated with construction activities, Alternative 4 would provide a reduction of GHG emissions through the sequestration of GHG by the native plants.

(2) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs?

Alternative 4 would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. As mentioned above, Alternative 4 would reduce GHG emissions in compliance with the goals of AB 32.

4.7.3.6 ALTERNATIVE 5, DUST CONTROL MEASURES APPLIED TO 194 ACRES USING IRRIGATION WATER DELIVERED VIA KCSD WATER WELL / PIPELINE TO IRRIGATION SYSTEM AND SELECTED MANUAL WATERING

Under Alternative 5, the DCMs would be the same as the proposed project / proposed action. In Alternative 5, water obtained from the KCSD well would be transported to the project via a temporary pipeline that connects into the KCSD water system near the KCSD well site. Water would be supplied directly to the temporary irrigation system from the KCSD, in lieu of the District's Fault Test well. As with Alternatives 3 and 4, Alternative 5 would include a temporary aboveground irrigation system installed within the 95 percent control level area to provide water to the project area. Plants within the sensitive 85 percent control area would be watered by hand using the same method as described above. The ATV mounted tanks would be filled with water from the delivery system within the project.

A. Direct and Indirect Impacts

Due to the addition of an irrigation system, the GHG emissions analysis for Alternative 5 includes an additional construction phase for the construction of the irrigation system. Furthermore, since Alternative 5 involves a direct water line from the KCSD system, no water trucks are required for operations. Therefore, GHG emissions associated with water trucks were not included for the analysis of Alternative 5. As a result of the direct water line from the KCSD system, the GHG emission impact is anticipated to be significantly less than the proposed project / proposed action (Table 4.7.3.6-1, *CO_2 and CO_{2e} Emissions for Alternative 5)*.

TABLE 4.7.3.6-1
CO_2 AND CO_{2E} EMISSIONS FOR ALTERNATIVE 5

Construction Emission Sourced*	CO_2 Emissions	CO_{2e} Emissions
	Metric Tons/Year	Metric Tons/Year
Maximum Construction Emissions	**3,892.05**	**3,916.12**
Operational Emission Sources**	**Metric Tons/Year**	**Metric Tons/Year**
Operational Activity	1,856.42	1,868.06
ATVs	3.18	3.19
Water Trucks	0	0
Mobile Sources	1.41	1.42
Maximum Operational Emissions	**1,861.01**	**1,872.67**

NOTE: * Construction-related emissions are anticipated to last for up to 11 months.
** Operation-related emissions are anticipated to last for up to 3 years.

B. CEQA Significance Determinations

Would Alternative 5:

(1) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

Alternative 5 would not result in a significant impact on the environment through the generation of GHG emissions. With the exception of minor emissions associated with construction activities, the Alternative 5 would provide a reduction of GHG emissions through the sequestration of GHG by the native plants.

(2) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs?

Alternative 5 would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. As mentioned above, Alternative 5 would reduce GHG emissions in compliance with the goals of AB 32.

4.7.3.7 ALTERNATIVE 6, NO PROJECT / NO ACTION ALTERNATIVE

No Project / No Action Alternative, assumes that the dust control measures would not be implemented on the proposed project / proposed action site and windblown dust and associated PM_{10} emissions would continue to pose a health hazard to the communities of Keeler and Swansea. Under Alternative 6 it is likely that during high wind events, the NAAQS and California state standards for PM_{10} would continue to be exceeded in violation of the 2008 SIP. The sand dunes on the proposed project / proposed action site would continue to migrate to the south-southeast toward the community of Keeler and natural resources within the dunes would continue to be affected by the shifting sands resulting from high wind events.

A. CEQA Significance Determinations

Would Alternative 6:

(1) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

Alternative 6 would not result in a significant impact on the environment through the generation of GHG emissions. Because the proposed project is designed to control the active dust source within the Keeler Dunes, Alternative 5 would result in the continuation of PM_{10} emissions from the Keeler Dunes. Unlike the previous alternatives, no native plants would be established in Alternative 6 and, therefore, no sequestration of GHG would occur.

(2) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs?

Alternative 6 would result in the continuation of PM_{10} emissions from the Keeler Dunes, and thus be inconsistent with the goals set forth by AB 32 for reducing GHG emissions.

4.7.4 MITIGATION MEASURES

Operation of the proposed project / proposed action would not be expected to have any adverse impacts upon GHG emissions, and would reduce GHG emissions in compliance with the goals of AB 32. Therefore, no mitigation measures are required.

4.7.5 RESIDUAL IMPACTS AFTER MITIGATION

There would be no anticipated significant impacts GHG emissions.

4.8 HYDROLOGY AND WATER QUALITY

This section assesses the possible effects to hydrology and water quality that could result from the proposed project / proposed action and alternatives. The hydrology and water quality environmental setting is presented in Section 3.8 of this EIR/EA. The existing conditions were evaluated based on their potential to be affected by activities of the proposed project / proposed action and/or alternatives to the proposed project / proposed action. The section addresses potential environmental impacts associated with implementation of the proposed project / proposed action such as effects on surface water or groundwater hydrology and quality and exposure to flood risks. The District has incorporated measures in to the proposed project / proposed action description to reduce or avoid adverse impacts anticipated from activities resulting from the proposed project / proposed action and the proposed project / proposed action alternatives. Information contained in this section is summarized from U.S. Geological Survey (USGS) 7.5-minute series topographic quadrangles Owens Lake[1] and Dolomite[2] and Flood Insurance Rate Map (FIRM) Numbers 06027C2225D[3] and 06027C2575D and was used to design the proposed project / proposed action to avoid areas within active blue-line drainages and thus avoid impacts to hydrology and water quality.[4] A discussion of cumulative impacts related to hydrology water quality is included in Section 5.8.

4.8.1 STUDY METHODS

This section describes effects on hydrology and water quality that would be caused by implementation of the proposed project / proposed action and alternatives. The focus of the analysis is on the placement of the straw bales and planting of the native vegetation. There are no proposed buildings or structures; therefore, there would be no change in the soil permeability of the proposed project / proposed action area.

Existing conditions relevant to the discussion of hydrology, drainage, and water quality were presented in Section 3.8 of this EIR/EA. These baseline conditions were evaluated here based on their potential to be affected by construction, operation, and monitoring activities. Construction, operation, and monitoring activities are described in Section 2 of this EIR/EA and were used in formulating the analysis. Impacts to hydrology and water quality were identified based on any adverse changes to these resources resulting from proposed project / proposed action construction, operation, or monitoring. The proposed project / proposed action, as described in Section 2 of this EIR/EA, requires that soil erosion, sedimentation, and runoff (e.g. runoff containing grease, oil, sediment and heavy metals) shall be controlled during construction in accordance with an NPDES Construction General Permit, approved SWPPP and associated Best Management Practices (BMPs). The specified BMPs have been required to reduce the potential for fuel spills and transport of pollutant runoff with the development of approved Hazardous Materials Business Plan (HMBP) and a Spill Prevention Control, and Countermeasure plan (SPCC). The proposed project / proposed action areas are not within a 100-year flood zone area.

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[1] U.S. Geological Survey. 1987. *7.5-Minute Series, Owens Lake, California, Topographic Quadrangle*. Denver, CO

[2] U.S. Geological Survey. 1987. *7.5-Minute Series, Dolomite, California, Topographic Quadrangle*. Denver, CO.

[3] Federal Emergency Management Agency. "Inyo County, California Map ID: 06027C2225D." Flood Insurance Rate Map. Available at: http://msc.fema.gov/webapp/wcs/stores/servlet/FemaWelcomeView?storeId=10001&catalogId=10001&langId=-1

[4] Federal Emergency Management Agency. "Inyo County, California Map ID: 06027C2575D." Flood Insurance Rate Map. Available at: http://msc.fema.gov/webapp/wcs/stores/servlet/FemaWelcomeView?storeId=10001&catalogId=10001&langId=-1

4.8.2 CEQA SIGNIFICANCE CRITERIA / NEPA REQUIREMENTS

For purposes of the analysis, the CEQA Significance Determinations and NEPA Requirements are discussed concurrently where applicable (i.e. with regard to CEQA Guidelines criterion). For NEPA disclosure, the impact analysis is referring to the proposed project / proposed action or an alternative. Direct effects (or impacts) are those occurring in the same place and time as the proposed project / proposed action with regard to construction and monitoring. Direct natural resource impacts would occur if the proposed project / proposed action or an alternative is exposed to flood hazards or if the proposed project / proposed action or an alternative would alter the amount and quality of runoff from the proposed project / proposed action site during construction and monitoring. Indirect effects (or impacts) are those that could result from the proposed project / proposed action or an alternative, but are later in time (for example after construction and monitoring or further removed in distance (for example, several miles from the proposed project / proposed action site).

4.8.2.1 CEQA SIGNIFICANCE CRITERIA

The potential for the proposed project to result in impacts to hydrology and water quality was analyzed in relation to the questions contained in Appendix G of the State CEQA Guidelines. Under CEQA, the potential for the proposed project or proposed project alternatives to result in impacts related to hydrology and water quality was analyzed in relation to the questions contained in Appendix G of the State CEQA Guidelines. A significant impact on hydrology and water quality would normally be determined to occur if the proposed project or proposed project alternatives triggered one of the 10 thresholds established by Appendix G of the CEQA Guidelines:

(1) Violate any water quality standards or waste discharge requirements

(2) Substantially deplete groundwater supplies or interfere with groundwater recharge leading to a net deficit in aquifer volume or a lowering of the local groundwater table level (i.e., the production rate of preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)

(3) Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation either on-site or off-site

(4) Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river or substantial increase in the rate or amount of surface runoff in a manner that would result in flooding either on-site or off-site

(5) Create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff

(6) Otherwise substantially degrade water quality

(7) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map, or other flood hazard delineation map

(8) Place structures within a 100-year flood hazard area that would impede or redirect flood flows

(9) Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam

(10) Result in inundation by seiche, tsunami, or mudflow

4.8.2.2 NEPA REQUIREMENTS

NEPA does not have any requirements specific to hydrology and water quality which would apply to the proposed action. The context and intensity of the environmental effects (40 CFR Part 1508.27) of the proposed action and alternatives with regard to alteration of drainage patterns or degradation of water quality, as well as with regard to exposure to any existing or potential flood hazards, are assessed with regard to the methods provided to the applicable Significance Criteria identified by CEQA.

4.8.3 ENVIRONMENTAL CONSEQUENCES

4.8.3.1 PROPOSED PROJECT / PROPOSED ACTION, DUST CONTROL MEASURES APPLIED TO 194 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / ATVS

The proposed project / proposed action will entail the establishment and management of native vegetation and the use of straw bales as temporary windbreaks positioned within an area of approximately 194 acres to stabilize the surface. Other proposed project / proposed action elements include temporary access routes, temporary staging areas for equipment and materials storage, and an effectiveness monitoring program (existing air monitoring stations). Further details of the proposed project / proposed action are described in Section 2.2.1, *Proposed Action and Alternatives*.

A. Direct and Indirect Impacts

Construction

Surface Water Quality. There are no perennial surface water bodies in the proposed project / proposed action site. The nearest surface water resources are Black Sand Spring and Horse Pasture Spring, located approximately 0.25 mile downgradient (west) of the proposed project / proposed action site (Figure 3.8.2.2-2, *Springs in Study Area Vicinity*). The bed of Owens Lake, approximately 1/4 mile downgradient of the proposed project / proposed action area, has been developed with the Shallow Flooding dust control measure, in conjunction with 2008 SIP. The extant Owens Lake brine pool is located downgradient and 7 miles to the west of the Keeler Dunes.

The proposed project / proposed action would not involve demolition activities or building of any permanent structures or impervious surfaces that could affect surface water quality. Minimal disturbance of staging areas and access routes may result in short-term impacts on surface water quality and drainage from potential soil erosion occurring during infrequent rain events. Indirect impacts may result from the influence of sediment laden storm water runoff flowing off-site from the construction site, including preparation of staging areas and the temporary access routes, to Owens Lake and springs located downgradient of the proposed project / proposed action. Construction and monitoring of the proposed project / proposed action, including the placement of straw bales and planting of native vegetation are not expected to result in impacts with regards to water quality, as the straw bales would effectively capture any storm water that reaches the proposed project / proposed action area as sheetflow. Temporary staging areas and access routes would be constructed outside the ephemeral drainages. The District has required the preparation a Storm Water Pollution Prevention Plan (SWPPP) and implementation of BMPs[5] during construction to protect surface water quality from potential impacts related to surface water. In addition, the District has required, as an element of the proposed project / proposed action, that installation of the straw bales and native plants shall be required to comply with all provisions of the National Pollutant Discharge Elimination System (NPDES) permit issued by the California Regional Water Quality Control Board, Lahontan Region as they related to avoiding impacts from storm water runoff during construction. In addition, provisions for a monitoring and maintenance program to address proposed project / proposed action areas needing maintenance would be included in the SWPPP to avoid conditions that have the potential to pose a threat to water quality, as specified in Sections 1 and 2 of this EIR/EA.

Pollutants associated with use and maintenance of construction vehicles needed for the proposed project / proposed action include hazardous materials such as oil, fuel and lubricants. These pollutants would adversely affect water quality if they reached a surface or groundwater resource. The potential for degradation of surface water by pollutants shall be avoided through preparation of a SWPPP for construction activities and implementation of BMPs for construction, refueling, and any waste handling activities.[6] In addition, a HMBP and SPCCC shall be prepared and submitted for approval to Inyo County, prior to the deployment of vehicles or equipment to the proposed project / proposed action area.

The proposed project / proposed action would not be expected to result in significant impacts to hydrology and water quality with the incorporation of the SWPPP, HMBP, and SPCCC in into the proposed project / proposed action design.

Drainage. There are two blue-line drainages shown within the study area. One of the drainages has been abandoned due to construction of water diversion berms by Caltrans in 1950. The second drainage cuts through the proposed project / proposed action area and provides a path for storm flows to cross from the Inyo Mountains to Owens Lake. The proposed project / proposed action has been designed to avoid the one still active blue-line drainage within the proposed project / proposed action area. There would be no installation of straw bales or native plants within the ephemeral drainage. The proposed project / proposed action does not entail the construction of any impervious areas or structures that would affect drainage patterns. Upon completion of the proposed project / proposed action, the natural area would continue to drain to the west-southwest. Only minimal brushing and grubbing of the ground surface for the development of temporary staging areas and access routes may be required to construct the proposed project / proposed action. Temporary staging areas would not be constructed in active drainages. Transport of straw bales and irrigation water would be accomplished with the use of rubber-tired vehicles that would cross active and abandoned blue-line drainages; however, there would be no grading within drainages. The access route through the middle of the project crosses the ephemeral drainages. There would not be any change in the existing topography due to the development or use of the access routes. No installation of the straw bales will take place within the abandoned historic blue-line drainages. The straw bales and native vegetation would maintain the existing permeable surface within the proposed project / proposed action area.

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[5] California Stormwater Quality Association. 2003. *California Stormwater Best Management Practice Handbooks: Construction*. Menlo Park, CA. Available at: http://www.cabmphandbooks.com/Documents/Construction/Section_3.pdf

[6] California Stormwater Quality Association. 2003. *California Stormwater Best Management Practice Handbooks: Construction*. Menlo Park, CA. Available at: http://www.cabmphandbooks.com/Documents/Construction/Section_3.pdf

Groundwater. Impacts to groundwater would include any significant degradation of water quality or major changes in groundwater elevations that could potentially impact local groundwater production wells or wetlands. The proposed project / proposed action would not create impervious surfaces or otherwise affect the recharge of the proposed project / proposed action property. There would be no temporary or permanent structures proposed that would alter groundwater flow or recharge and no dewatering activities would be required as part of the proposed project / proposed action.

Approximately 5 gallons of water will be applied under each straw bale prior to planting.[7] The plants would also be watered with approximately 3 gallons of water per bale immediately after the plants are placed in the ground. Total water needs during planting are expected to amount to approximately 3.02 acre-feet (985,480 gallons). It is expected that supplemental watering may be provided to the plants during the first 3 years of the proposed project / proposed action when rainfall is less than 50 percent of the average annual rainfall or is needed based on poor plant health. A total of about 5.29 acre-feet of water may be applied during the first year of the proposed project / proposed action. During each of the second, third, years of the proposed project / proposed action the estimated total annual water duty would be about 2.27 acre-feet. The total water demand for the proposed project / proposed action and proposed project / proposed action alternatives is estimated at up to 9.83 acre-feet (3.2 million gallons) over the 3-year period. The Fault Test production well can supply 120,000 gallons over an 8 hour period, almost 8 times more than would be needed per day of watering. Consequently, the proposed project / proposed action's daily water demand during proposed project / proposed action implementation would not result in drawdown of the water table.[8]

100-Year Flood Zone. The proposed project / proposed action is not within a 100-year flood hazard area would not involve construction of any housing or other permanent structures. Therefore, the proposed project / proposed action would not be expected to result in impacts to hydrology and water quality related to the exposure of people or property to hazards associated with the 100-year flood zone.

Seiche, Tsunamis, and Mudflows. Implementation of the proposed project / proposed action would not result in inundation by a seiche, tsunami, or mudflow. Seiches and tsunamis are the result of tectonic activity, such as an earthquake. A seiche is an oscillation of the surface of a landlocked body of water that can create a hazard to persons and structures on and in the vicinity of the water. A tsunami is a long-period, high velocity tidal surge that can result in a series of very low (trough) and high (peak) sea levels, with the potential to inundate areas up to several miles from the coast, creating hazards to people or structures from loss, injury, or death. Most of the hazards created by a tsunami come when a trough follows the peak, resulting in a rush of sea water back into the ocean. A mudflow is a moving mass of soil-made fluid by a loss of shear strength, generally as a result of saturation from rain or melting snow. Due to the low surface gradient of the proposed project / proposed action study area and the distance from the ocean and other bodies of water, there would be no direct or indirect impacts related to seiches or tsunamis. The low relief of the proposed project / proposed action study area does not contribute to the risk of earthquake-related ground failures that would result in mudflows; therefore, there would be no direct or indirect impacts.

[7] Groeneveld, D.P., HydroBio Advanced Remote Sensing. 12 September 2012. Telephone conversation with D. Grotzinger, Sapphos Environmental, Inc., Pasadena, CA.

[8] Holder, G., Great Basin Unified Air Pollution Control District, Bishop, CA. 20 September, 2013. Email to Eric Charlton, Sapphos Environmental, Inc., Pasadena, CA.

Operations and Maintenance

Surface Water Quality. The proposed project / proposed action has been designed to require minimal maintenance. Operation of the proposed project / proposed action would have no impacts on hydrology and water quality. Operation activities would include maintenance of the ongoing air quality monitoring stations, supplemental watering and monitoring of plant growth and straw bale condition, and activities associated with replacement of broken straw bales and the addition of plants as needed. Upon establishment of a native vegetation community on the dunes, primary operational activities would include continued air monitoring. Annual reviews would determine whether additional dust control measures would need to be applied. The erosion control measures in the Storm Water Pollution Prevention Plan, as specified in Sections 1 and 2 of this EIR/EA, would avoid conditions that have the potential to pose a threat to water quality during implementation and monitoring of the proposed project / proposed action.

Drainage. Upon completion of the proposed project / proposed action, the natural area would continue to drain to the west-southwest. The abandoned blue-line drainage would remain in situ.

Groundwater. Groundwater is the proposed source of water for initial and supplemental watering of the native vegetation the first three years of the proposed project / proposed action (Figure 2.1.5.2-3, *Water Supply*). The water demand for the proposed project / proposed action during planting is estimated to be 3.02 acre-feet (985,480 gallons). There may be up to two supplemental watering events per year. Each watering event would require 1.13 acre-feet of water per event (up to 2.26 acre-feet of water annually). The total water demand for the proposed project / proposed action and action alternatives is estimated to be up to 9.83 acre-feet (3.2 million gallons) over a 3-year period. Water would be distributed across the 194 acre proposed project / proposed action study area at each straw bale site (up to 5 gallons per bale). The proposed groundwater source is the District's Fault Test 12-inch production well located approximately 0.7 mile northwest of the proposed project / proposed action. The Fault Test well is an artesian (flowing) well capable of producing 250 gallons of water per minute (gpm) on a sustained basis[9] and utilization of this water source is not expected have an indirect negative impact on groundwater levels at this off-site location. As an alternative, the backup water supplies can be obtained from the District's River Wells or purchased from Keeler Community Service District (KCSD).[10]

Water withdrawal for the proposed project / proposed action is short term, occurring over short periods of time (2 to 4 months for each irrigation event) for up to 3 years. Groundwater used for watering would not leave the Owens Lake Hydrologic Basin; it would be applied to ground within the basin near the withdrawal site. The withdrawals from the artesian Fault Test Well are not anticipated to impact the KCSD well located approximately 2.75 miles southwest.[11] The establishment of native vegetation in the project has been designed to re-establish vegetation communities in the pre-historic dune environment that are extant at other locations in terrestrial upland areas above the historic elevation of Owens Lake. The result of the pilot study and presence of extant vegetated dunes in the vicinity of Owens Lake demonstrate the feasibility of maintaining vegetated dunes with the existing hydrologic conditions.

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[9] Holder, G., Great Basin Unified Air Pollution Control District, Bishop, CA. 9 October 2012. Telephone conversation with D. Grotzinger, Sapphos Environmental, Inc., Pasadena, CA.

[10] Holder, G., Great Basin Unified Air Pollution Control District, Bishop, CA. 20 September, 2013. Email to Eric Charlton, Sapphos Environmental, Inc., Pasadena, CA.

[11] Holder, G., Great Basin Unified Air Pollution Control District, Bishop, CA. 20 September, 2013. Email to Eric Charlton, Sapphos Environmental, Inc., Pasadena, CA.

B. CEQA Significance Determinations

Construction

(1) Violate any water quality standards or waste discharge requirements

The District has required the preparation of SWPPP, HMBP, and SPCC plan to protect surface water quality and prevent discharges to downgradient springs, water-based dust control measures, and the brine pool. The proposed project site is relatively flat and requires minimal localized grading to accommodate temporary access routes and staging areas. The proposed project has been designed to maintain the existing site grading and drainage, thus there would be no alteration in surface drainage patterns. Similarly, there would be no expected increase in surface water runoff, as the proposed project is comprised of straw bales and native vegetation that would not be expected to contribute runoff water in excess of the capacity of the abandoned ephemeral drainages. Soil erosion, sedimentation and runoff (e.g. runoff containing grease, oils, sediment, and heavy metals) shall be controlled during construction in accordance with an NPDES Construction General Permit, SWPPP and associated BMPs. The District has also identified BMPs to reduce potential for fuel spills and transport of polluted runoff. Therefore, less than significant impacts under CEQA would occur relative to violating water quality standards and degrading water quality during construction of the proposed project.

(2) Substantially deplete groundwater supplies or interfere with groundwater recharge leading to a net deficit in aquifer volume or a lowering of the local groundwater table level (i.e., the production rate of preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted).

The Fault Test production well can supply 120,000 gallons over an 8 hour period and the full amount of water needed for the 3 year project can be produced in less than 9 days. Results from the flow tests conducted at the fault Test site show that the well and surrounding area will not be affected by this amount of water production. The proposed project does not create any impervious surfaces; therefore there would no impacts to groundwater recharge.

(3) Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation either on-site or off-site.

The proposed project has been designed to avoid impacts to extant and abandoned blue-line drainages; therefore, there are no impacts to the existing drainage pattern of the site that would contribute to erosion or siltation either on-site or off-site.

(4) Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river or substantial increase in the rate or amount of surface runoff in a manner that would result in flooding either on-site or off-site.

The proposed project has been designed to avoid impacts to extant and abandoned blue-line drainages; therefore, there would be no impacts to the existing drainage pattern of the site that would contribute flooding either on-site or off-site.

(5) Create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff.

The proposed project would not create any impervious surfaces; therefore there would be no anticipated increase of runoff water; therefore, there would be no anticipated significant impacts to existing or planned storm water drainage systems. The District has required, as an element of the proposed project, the control of erosion, sedimentation and runoff (e.g. runoff containing grease, oils, sediment, and heavy metals during construction in accordance with an NPDES Construction General Permit, SWPPP and associated BMPs.

(6) Otherwise substantially degrade water quality

The District has required, as an element of the proposed project, the control of erosion, sedimentation and runoff (e.g. runoff containing grease, oils, sediment, and heavy metals during construction in accordance with an NPDES Construction General Permit, SWPPP and associated BMPs; therefore, the proposed project would not expected to otherwise substantially degrade water quality.

(7) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map, or other flood hazard delineation map

Not Applicable

(8) Place structures within a 100-year flood hazard area that would impede or redirect flood flows

Not Applicable

(9) Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam

Not Applicable

(10) Result in inundation by seiche, tsunami, or mudflow

The proposed project would not include any perennial water bodies within the proposed project limits nor does it would not involve demolition activities or building of any permanent structures or impervious surfaces. The proposed project would include minimal grading and the use of construction vehicles. The existing site surface grade and drainage would be retained as part of the proposed project. Soil erosion, sedimentation, and runoff (e.g. runoff containing grease, oil, sediment and heavy metals) shall be controlled during construction in accordance with an NPDES Construction General Permit, approved SWPPP and associated BMPs. The District has also identified BMPs to reduce the potential for fuel spills and transport of pollutant runoff with the development of approved HMBP and SPCC. The site is not within a 100-year flood zone area and is not subject to flooding. Due to the low surface gradient and the distance from the ocean and other water bodies, the proposed project is not subject to inundation by seiche, tsunami, or mudflow. Therefore, less than significant impacts under CEQA would occur relative to surface water quality, drainage, groundwater, 100-year flood zone, or seiche, tsunami, or mudflow.

Operations and Maintenance

(1) Violate any water quality standards or waste discharge requirements

(2) Substantially deplete groundwater supplies or interfere with groundwater recharge leading to a net deficit in aquifer volume or a lowering of the local groundwater table level (i.e., the production rate of preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)

(3) Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation either on-site or off-site

(4) Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river or substantial increase in the rate or amount of surface runoff in a manner that would result in flooding either on-site or off-site

(5) Create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff

(6) Otherwise substantially degrade water quality

(7) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map, or other flood hazard delineation map

(8) Place structures within a 100-year flood hazard area that would impede or redirect flood flows

(9) Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam

(10) Result in inundation by seiche, tsunami, or mudflow

The proposed project has been designed to require minimal maintenance. Operational activities would include operation and maintenance of the air quality monitoring stations, supplemental watering and monitoring of plant growth and straw bale condition, and activities associated with the replacement of broken bales and dead plants. The proposed project elements have been designed to avoid active and inactive blue line drainages, with the exception of limited crossing by rubber-tired vehicles. The staging areas and access routes that have been designed as elements of the proposed project/proposed project have been designed to minimize disturbance. Sufficient groundwater exists for use by the proposed project for the watering of the native vegetation from the District's Fault Test well. Groundwater used for watering would not leave the Owen Lake Hydrological Basin. Therefore, less than significant impacts under CEQA would occur relative to surface water quality, drainage, and groundwater.

4.8.3.2 Alternative 1, Dust Control Measures Applied to 214 Acres Using Irrigation Water Delivered via Water Trucks / ATVs

Under Alternative 1, construction would be essentially the same as for the proposed project / proposed action (as described in Section 2.2.2). The primary difference between the alternatives would be the total number of plants and straw bales that would be transported to the project site and distributed onto a larger area (20 additional acres) of dust control. Alternative 1 would result in a greater number of plants and straw bales; hence, additional workers and equipment may be necessary to complete the alternative in the same time frame as the proposed project / proposed action. As with the proposed project / proposed action, supplemental irrigation in the first 3 years following installation of native vegetation would be completed via hauling of water in small water tanks (about 150–200 gallons) mounted on a trailer and pulled with an ATV and then irrigation would be conducted by hand through a small diameter hose.

A. Direct and Indirect Impacts

Construction

Under Alternative 1, construction activities would be essentially the same as for the proposed project / proposed action. The primary construction scenario difference between the Alternative 1 and the proposed project / proposed action would be the total number of plants and straw bales that would be transported to the proposed project / proposed action site and distributed on-site. Alternative 1 would result in a greater number of plants and straw bales, hence a slightly longer construction period would be required and/or additional workers and equipment would be necessary to complete the proposed project / proposed action in the same timeframe as the proposed alternative. The direct and indirect impacts would be similar to those outlined in the proposed project / proposed action above. Alternative 1 would not be expected to result in significant impacts to hydrology and water quality with the incorporation of the SWPPP, HMBP, and SPCCC in into the proposed project / proposed action design.

Operations and Maintenance

Under Alternative 1, operation and maintenance activities would be essentially the same as for the proposed project / proposed action. The direct and indirect impacts would be similar to those outlined in the proposed project / proposed action above. Alternative 1 would not be expected to result in significant impacts to hydrology and water quality.

B. CEQA Significance Determinations

Construction

(1) Violate any water quality standards or waste discharge requirements

(2) Substantially deplete groundwater supplies or interfere with groundwater recharge leading to a net deficit in aquifer volume or a lowering of the local groundwater table level (i.e., the production rate of preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)

(3) Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation either on-site or off-site

(4) Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river or substantial increase in the rate or amount of surface runoff in a manner that would result in flooding either on-site or off-site

(5) Create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff

(6) Otherwise substantially degrade water quality

(7) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map, or other flood hazard delineation map

(8) Place structures within a 100-year flood hazard area that would impede or redirect flood flows

(9) Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam

(10) Result in inundation by seiche, tsunami, or mudflow

Alternative 1 would not include any perennial water bodies within the proposed project limits nor would it involve demolition activities or building of any permanent structures or impervious surfaces. Alternative 1 does, , include minimal brushing and grubbing however, the existing site surface grade and drainage would be retained as part of the proposed project. Soil erosion, sedimentation, and runoff (e.g. runoff containing grease, oil, sediment and heavy metals) shall be controlled during construction in accordance with an NPDES Construction General Permit, approved SWPPP and associated BMPs. The District has also identified BMPs to reduce the potential for fuel spills and transport of pollutant runoff with the development of approved HMBP and SPCC. The site is not within a 100-year flood zone area and is not subject to flooding. Due to the low surface gradient and the distance from the ocean and other water bodies, Alternative 1 is not subject to inundation by seiche, tsunami, or mudflow. Therefore, less than significant impacts under CEQA would occur relative to surface water quality, drainage, groundwater, 100-year flood zone, or seiche, tsunami, or mudflow.

Operations and Maintenance

(1) Violate any water quality standards or waste discharge requirements

(2) Substantially deplete groundwater supplies or interfere with groundwater recharge leading to a net deficit in aquifer volume or a lowering of the local groundwater table level (i.e., the production rate of preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)

(3) Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation either on-site or off-site

(4) Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river or substantial increase in the rate or amount of surface runoff in a manner that would result in flooding either on-site or off-site

(5) Create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff

(6) Otherwise substantially degrade water quality

(7) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map, or other flood hazard delineation map

(8) Place structures within a 100-year flood hazard area that would impede or redirect flood flows

(9) Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam

(10) Result in inundation by seiche, tsunami, or mudflow

Alternative 1 has been designed to require minimal maintenance. Operational activities would include operation and maintenance of the air quality monitoring stations, supplemental watering and monitoring of plant growth and straw bale condition, and activities associated with the replacement of broken bales. Alternative 1 elements have been designed to avoid active and inactive blue-line drainages, with the exception of limited crossing by rubber-tired vehicles. The staging areas and access routes that have been designed as elements of Alternative 1 have been designed to minimize disturbance and only minimal grading of the ground surface for staging areas and access routes would be required. Sufficient groundwater exists for use by the proposed project for the watering of the native vegetation from the District's Fault Test well. Groundwater used for watering would not leave the Owen Lake Hydrological Basin. Therefore, less than significant impacts under CEQA would occur relative to surface water quality, drainage, and groundwater.

4.8.3.3 ALTERNATIVE 2, DUST CONTROL MEASURES APPLIED TO 197 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / ATVS

Alternative 2 has DCMs applied at different intensities in different areas of the Keeler Dunes, and the total acreage treated is 3 acres larger than the proposed project / proposed action (as described in Section 2.2.3) This alternative focuses on applying the highest intensity of dust control (95 percent control efficiency) across the Keeler Dunes and inter-dune sand sheet areas (170 acres), while applying less intensive controls on other inter-dune and sensitive cultural areas (27 acres at 90 percent dust control efficiency). The staging areas, access routes, construction scenario, and watering would remain the same as for the proposed project / proposed action; only the numbers of straw bales and plants and the area they are applied to would be increased by less than 3 percent due to the additional 3 acres to be treated. The construction scenario, access routes, staging areas and other design features would be largely the same as for the proposed project / proposed action although the area of impact would be 3 acres larger.

A. Direct and Indirect Impacts

Construction

Under Alternative 2, construction activities to install the dust control measures would be essentially the same as for the proposed project / proposed action. The primary construction scenario difference between the Alternative 2 and the proposed project / proposed action would be the total number of plants and straw bales that would be transported to the proposed project / proposed action site and distributed on-site. Alternative 2 would result in a greater number of plants and straw bales, hence a slightly longer construction period would be required and/or additional workers and equipment would be necessary to complete Alternative 2 in the same timeframe as the proposed project. The direct and indirect impacts would be similar to those outlined in the proposed project / proposed action above. Alternative 2 would not be expected to result in significant impacts to hydrology and water quality with the incorporation of the SWPPP, HMBP, and SPCCC in into the proposed project / proposed action design.

Operations and Maintenance

Under Alternative 2, operation and maintenance activities would be essentially the same as for the proposed project / proposed action. The direct and indirect impacts would be similar to those outlined in the proposed project / proposed action above. Alternative 2 would not be expected to result in significant impacts to hydrology and water quality.

B. CEQA Significance Determinations

Construction

(1) Violate any water quality standards or waste discharge requirements

(2) Substantially deplete groundwater supplies or interfere with groundwater recharge leading to a net deficit in aquifer volume or a lowering of the local groundwater table level (i.e., the production rate of preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)

(3) Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation either on-site or off-site

(4) Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river or substantial increase in the rate or amount of surface runoff in a manner that would result in flooding either on-site or off-site

(5) Create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff

(6) Otherwise substantially degrade water quality

(7) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map, or other flood hazard delineation map

(8) Place structures within a 100-year flood hazard area that would impede or redirect flood flows

(9) Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam

(10) Result in inundation by seiche, tsunami, or mudflow

As stated above, Alternative 2 does not include any perennial water bodies within the proposed project limits nor does it would not involve demolition activities or building of any permanent structures or impervious surfaces. No installation of the straw bales will take place within the abandoned historic blue-line drainages. The existing site surface grade and drainage would be retained as part of Alternative 2. Soil erosion, sedimentation, and runoff (e.g. runoff containing grease, oil, sediment and heavy metals) shall be controlled during construction in accordance with an NPDES Construction General Permit, approved SWPPP and associated BMPs. The District has also identified

BMPs to reduce the potential for fuel spills and transport of pollutant runoff with the development of approved HMBP and SPCC. The site is not within a 100-year flood zone area and is not subject to flooding. Due to the low surface gradient and the distance from the ocean and other water bodies, Alternative 2 is not subject to inundation by seiche, tsunami, or mudflow. Therefore, less than significant impacts under CEQA would occur relative to surface water quality, drainage, groundwater, 100-year flood zone, or seiche, tsunami, or mudflow.

Operations and Maintenance

(1) Violate any water quality standards or waste discharge requirements

(2) Substantially deplete groundwater supplies or interfere with groundwater recharge leading to a net deficit in aquifer volume or a lowering of the local groundwater table level (i.e., the production rate of preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)

(3) Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation either on-site or off-site

(4) Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river or substantial increase in the rate or amount of surface runoff in a manner that would result in flooding either on-site or off-site

(5) Create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff

(6) Otherwise substantially degrade water quality

(7) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map, or other flood hazard delineation map

(8) Place structures within a 100-year flood hazard area that would impede or redirect flood flows

(9) Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam

(10) Result in inundation by seiche, tsunami, or mudflow

As stated above, Alternative 2 has been designed to require minimal maintenance. Activities would include maintenance of the air quality monitoring stations, supplemental watering and monitoring of plant growth and straw bale condition, and activities associated with the replacement of broken bales and dead plants. The Alternative 2 elements have been designed to avoid active and inactive blue-line drainages, with the exception of limited crossing by rubber-tired vehicles. The staging areas and access routes of Alternative 2 have been designed to minimize disturbance. No grading of the ground surface for staging areas and access routes would be required. Sufficient groundwater exists for use by the proposed project for the watering of the native vegetation from the District's Fault Test well. Groundwater used for watering would not leave the Owen Lake Hydrological Basin. Therefore, less than significant impacts under CEQA would occur relative to surface water quality, drainage, and groundwater.

4.8.3.4 ALTERNATIVE 3, DUST CONTROL MEASURES APPLIED TO 194 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / TANKS / PVC IRRIGATION SYSTEM AND SELECTED MANUAL WATERING

Under Alternative 3, the DCMs would be the same as the proposed project / proposed action (as described in Section 2.2.4). Water obtained from the District's production well at the Fault Test site would be transported to the project via large water trucks to temporary storage tanks located at the three of the four designated staging areas. Since the staging areas are lower in elevation than the project area, each staging area would need to have a manifold and booster pump to pressurize the irrigation system. The use of water tanks mounted on ATVs, to distribute supplemental irrigation during the operations and maintenance phase of the project, would be replaced with a temporary aboveground irrigation system that would be installed within the 95 percent control level area to provide water to the project area. Plants within the sensitive 85 percent control area would be manually watered using the same method as described proposed project/proposed action. In the environmentally sensitive areas, the ATV mounted tanks would be filled with water from the delivery system within the project instead of from trucks at the staging areas.

A. Direct and Indirect Impacts

Construction

Under Alternative 3, construction activities would be essentially the same as for the proposed project / proposed action. Alternative 3 would not be expected to result in significant impacts to hydrology and water quality with the incorporation of the SWPPP, HMBP, and SPCCC in into the proposed project / proposed action design. The incorporation of an irrigation system would result in roughly 80 percent less ATV traffic. As a result, there would be fewer pollutants such as oil, fuel, and lubricants associated with vehicle maintenance to adversely affect water quality. The temporary irrigation system would have irrigation laterals that utilize detachable hoses to deliver water to the plant locations. The irrigation system would potentially increase the risk of the amount of surface runoff from any malfunction in the delivery of water to the plant locations. However, it is not anticipated that the potential runoff would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff.

Operations and Maintenance

Under Alternative 3, the dust control measures would be the same as the proposed project / proposed action (as described in Section 2.2.4). Water obtained from the District's production well at the Fault Test site would be transported to the site via large water trucks to temporary storage tanks located at the three of the four designated staging areas. Since the staging areas are lower in elevation than the Alternative 3 area, each staging area would need to have a manifold and booster pump to pressurize the irrigation system. The use of water tanks mounted on ATVs, to distribute supplemental irrigation during the operations and maintenance phase of Alternative 3, would be replaced with a temporary aboveground irrigation system that would be installed within the 95-percent control level area to provide water to the Alternative 3 area. Plants within the sensitive 85-percent control area would be manually watered using the same method as described proposed project / proposed action. In the environmentally sensitive areas, the ATV mounted tanks would be filled with water from the delivery system within Alternative 3 instead of from trucks at the staging areas. Alternative 3 would utilize a temporary irrigation system that would have irrigation laterals that utilize detachable hoses to deliver water to the plant locations. The irrigation system would potentially increase the risk of the amount of surface runoff from any malfunction in the delivery of water to the plant locations. However, it is not anticipated that the potential runoff would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff. Alternative 3 would not be expected to result in significant impacts to hydrology and water quality.

At the completion of each irrigation event, the irrigation system would be drained. Drainage valves will be installed along each lateral line such that approximately 200 gallons of water will be drained from each lateral onto the surface in a manner so that it does not leave the project area. Drainage water will be directed to planted bales locations where possible.

B. CEQA Significance Determinations

Construction

(1) Violate any water quality standards or waste discharge requirements

(2) Substantially deplete groundwater supplies or interfere with groundwater recharge leading to a net deficit in aquifer volume or a lowering of the local groundwater table level (i.e., the production rate of preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)

(3) Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation either on-site or off-site

(4) Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river or substantial increase in the rate or amount of surface runoff in a manner that would result in flooding either on-site or off-site

(5) Create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff

(6) Otherwise substantially degrade water quality

(7) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map, or other flood hazard delineation map

(8) Place structures within a 100-year flood hazard area that would impede or redirect flood flows

(9) Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam

(10) Result in inundation by seiche, tsunami, or mudflow

As stated above, Alternative 3 would not include any perennial water bodies within the proposed project limits nor would it involve demolition activities or building of any permanent structures or impervious surfaces. Soil erosion, sedimentation, and runoff (e.g. runoff containing grease, oil, sediment and heavy metals) shall be controlled during construction in accordance with an NPDES Construction General Permit, approved SWPPP and associated BMPs. The incorporation of an irrigation system would in roughly 80 percent less ATV traffic, than the proposed project / proposed action. As a result, there will be fewer pollutants such as oil, fuel, and lubricants associated with vehicle maintenance to adversely affect water quality. The irrigation system would potentially increase the risk of the amount of surface runoff from any malfunction in the delivery of water to the plant locations. However, it is not anticipated that the potential runoff would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff. The District has also identified BMPs to reduce the potential for fuel spills and transport of pollutant runoff with the development of approved HMBP and SPCC. The site is not within a 100-year flood zone area and is not subject to flooding. Due to the low surface gradient and the distance from the ocean and other water bodies, Alternative 3 is not subject to inundation by seiche, tsunami, or mudflow. Therefore, less than significant impacts under CEQA would occur relative to surface water quality, drainage, groundwater, 100-year flood zone, or seiche, tsunami, or mudflow.

Operations and Maintenance

(1) Violate any water quality standards or waste discharge requirements

(2) Substantially deplete groundwater supplies or interfere with groundwater recharge leading to a net deficit in aquifer volume or a lowering of the local groundwater table level (i.e., the production rate of preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)

(3) Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation either on-site or off-site

(4) Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river or substantial increase in the rate or amount of surface runoff in a manner that would result in flooding either on-site or off-site

(5) Create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff

(6) Otherwise substantially degrade water quality

(7) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map, or other flood hazard delineation map

(8) Place structures within a 100-year flood hazard area that would impede or redirect flood flows

(9) Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam

(10) Result in inundation by seiche, tsunami, or mudflow

Alternative 3 has been designed to require minimal maintenance. Activities would include maintenance of the air quality monitoring stations, supplemental watering and monitoring of plant growth and straw bale condition, and activities associated with the replacement of broken bales and dead plants. The Alternative 3 elements have been designed to avoid active and inactive blue-line drainages, with the exception of limited crossing by rubber-tired vehicles. The incorporation of an irrigation system would result in roughly 80 percent less ATV traffic than the proposed project / proposed action. As a result, there would be fewer pollutants such as oil, fuel, and lubricants associated with vehicle maintenance to adversely affect water quality. The staging areas and access routes of Alternative 3 have been designed to minimize disturbance and only minimal grading of the ground surface for staging areas and access routes will be required. Sufficient groundwater exists for use by the proposed project for the watering of the native vegetation from the District's Fault Test well. Groundwater used for watering would not leave the Owen Lake Hydrological Basin. The temporary irrigation system would have irrigation laterals that utilize detachable hoses to deliver water to the plant locations. The irrigation system would potentially increase the risk of the amount of surface runoff from any malfunction in the delivery of water to the plant locations. However, it is not anticipated that the potential runoff would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff. Therefore, less than significant impacts under CEQA would occur relative to surface water quality, drainage, and groundwater.

4.8.3.5 ALTERNATIVE 4, DUST CONTROL MEASURES APPLIED TO 194 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / PVC IRRIGATION SYSTEM AND SELECTED MANUAL WATERING

Under Alternative 4, the DCMs would be the same as the proposed project / proposed action (as described in Section 2.25). In Alternative 4, water obtained from the Fault Test Well would be transported to the project via water trucks and the water delivery system would be fed from three supply points along State Route 136. As with Alternative 3, plants within the 95 percent control area would be watered with hoses attached to the laterals of the temporary PVC irrigation system. In this alternative, water trucks would stage next to the highway and deliver water directly in to the temporary PVC irrigation system, rather than utilizing water tanks at the staging areas for temporary storage. As in Alternative 3, hand watering would be done in approximately 8 percent of the dust control area using hoses to deliver water from tanks mounted on ATVs, stage in a manner to avoid sensitive cultural resources. As with the temporary irrigation system, the ATV mounted tanks would be filled with water from the delivery system within the project instead of from tanks at the staging areas.

A. Direct and Indirect Impacts

Construction

Under Alternative 4, construction activities would be essentially the same as for the proposed project / proposed action. The direct and indirect impacts would be similar to those outlined in the proposed project / proposed action above. Alternative 4 would not be expected to result in significant impacts to hydrology and water quality with the incorporation of the SWPPP, HMBP, and SPCCC in into the proposed project / proposed action design. The incorporation of an irrigation system would result in roughly 80 percent less ATV traffic than that anticipated for the proposed project / proposed action. As a result, there would be fewer pollutants such as oil, fuel, and lubricants associated with vehicle maintenance to adversely affect water quality. The temporary irrigation system would have irrigation laterals that utilize detachable hoses to deliver water to the plant locations. The irrigation system would potentially increase the risk of the amount of surface runoff from any malfunction in the delivery of water to the plant locations. However, it is not anticipated that the potential runoff would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff. The water trucks connecting to the supply points at SR 136 pose an increased risk to potential runoff from leaks in the connections to the trunk lines that would be conveyed to any existing storm water collection system. However, from review of the topographical maps for the area, it is anticipated that the potential runoff would run southwest towards Owens Lake and dissipate into the soil before reaching any existing storm water drainage systems.

Operations and Maintenance

Under Alternative 4, the dust control measures would be the same as the proposed project / proposed action (as described in Section 2.2.4). Water obtained from the District's production well at the Fault Test site would be transported to the site via large water trucks, which would connect to the water delivery system from turnouts off of SR 136. The use of water tanks mounted on ATVs, to distribute supplemental irrigation during the operations and maintenance phase of Alternative 4, would be replaced with a temporary aboveground irrigation system that would be installed within the 95 percent control level area to provide water to the Alternative 4 area. Plants within the sensitive 85 percent control area would be manually watered using the same method as described proposed project / proposed action. In the environmentally sensitive areas, the ATV mounted tanks would be filled with water from the delivery system within the site instead of from trucks at the staging areas. Alternative 4 would utilize a temporary irrigation system that would have irrigation laterals that utilize detachable hoses to deliver water to the plant locations. The irrigation system would potentially increase the risk of the amount of surface runoff from any malfunction in the delivery of water to the plant locations. However, it is not anticipated that the potential runoff would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff. The water trucks connecting to the supply points at SR 136 pose an increased risk to potential runoff from leaks in the connections to the trunk lines that would be conveyed to any existing storm water collection system. However, from review of the topographical maps for the area, it is anticipated that the potential runoff would run southwest towards Owens Lake and dissipate into the soil before reaching any existing storm water drainage systems. Alternative 4 would not be expected to result in significant impacts to hydrology and water quality.

At the completion of each irrigation event, the irrigation system would be drained. Drainage valves would be installed along each lateral line such that approximately 200 gallons of water would be drained from each lateral onto the surface, in such a way that it does not leave the Alternative 4 area. Drainage water would be directed to planted bales locations where possible.

B. CEQA Significance Determinations

Construction

(1) Violate any water quality standards or waste discharge requirements

(2) Substantially deplete groundwater supplies or interfere with groundwater recharge leading to a net deficit in aquifer volume or a lowering of the local groundwater table level (i.e., the production rate of preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)

(3) Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation either on-site or off-site

(4) Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river or substantial increase in the rate or amount of surface runoff in a manner that would result in flooding either on-site or off-site

(5) Create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff

(6) Otherwise substantially degrade water quality

(7) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map, or other flood hazard delineation map

(8) Place structures within a 100-year flood hazard area that would impede or redirect flood flows

(9) Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam

(10) Result in inundation by seiche, tsunami, or mudflow

Alternative 4 would not include any perennial water bodies within the proposed project limits nor would it involve demolition activities or building of any permanent structures or impervious surfaces. Soil erosion, sedimentation, and runoff (e.g. runoff containing grease, oil, sediment and heavy metals) would be controlled during construction in accordance with an NPDES Construction General Permit, approved SWPPP and associated BMPs. The incorporation of an irrigation system would result in roughly 80 percent less ATV traffic, than that anticipated for the proposed project / proposed action. As a result there would be fewer pollutants such as oil, fuel, and lubricants associated with vehicle maintenance to adversely affect water quality. The irrigation system would potentially increase the risk of the amount of surface runoff from any malfunction in the delivery of water to the plant locations. Additionally the water trucks connecting to the supply points at SR 136 pose an increased risk to potential runoff from leaks in the connections to the trunk lines that would be conveyed to any existing storm water collection system. However, from review of the topographical maps for the area, it is anticipated that the potential runoff would run southwest towards Owens Lake and dissipate into the soil before reaching any existing storm water drainage systems. The District has also identified BMPs to reduce the potential for fuel spills and transport of pollutant runoff with the development of approved HMBP and SPCC. The site is not within a 100-year flood zone area and is not subject to flooding. Due to the low surface gradient and the distance from the ocean and other water bodies, Alternative 4 is not subject to inundation by seiche, tsunami, or mudflow. Therefore, less than significant impacts under CEQA would occur relative to surface water quality, drainage, groundwater, 100-year flood zone, or seiche, tsunami, or mudflow.

Operations and Maintenance

(1) Violate any water quality standards or waste discharge requirements

(2) Substantially deplete groundwater supplies or interfere with groundwater recharge leading to a net deficit in aquifer volume or a lowering of the local groundwater table level (i.e., the production rate of preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)

(3) Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation either on-site or off-site

(4) Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river or substantial increase in the rate or amount of surface runoff in a manner that would result in flooding either on-site or off-site

(5) Create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff

(6) Otherwise substantially degrade water quality

(7) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map, or other flood hazard delineation map

(8) Place structures within a 100-year flood hazard area that would impede or redirect flood flows

(9) Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam

(10) Result in inundation by seiche, tsunami, or mudflow

Alternative 4 has been designed to require minimal maintenance. Activities would include maintenance of the air quality monitoring stations, supplemental watering and monitoring of plant growth and straw bale condition, and activities associated with the replacement of broken bales and dead plants. The Alternative 4 elements have been designed to avoid active and inactive blue-line drainages, with the exception of limited crossing by rubber-tired vehicles. The incorporation of an irrigation system would result in roughly 80 percent less ATV traffic, than that anticipated for the proposed project / proposed action. As a result there would be fewer pollutants such as oil, fuel, and lubricants associated with vehicle maintenance to adversely affect water quality. The staging areas and access routes of Alternative 4 have been designed to minimize disturbance and only minimal grading of the ground surface for staging areas and access routes would be required. Sufficient groundwater exists for use by the proposed project for the watering of the native vegetation from the District's Fault Test well. Groundwater used for watering would not leave the Owen Lake Hydrological Basin. The temporary irrigation system would have irrigation laterals that utilize detachable hoses to deliver water to the plant locations. The irrigation system would potentially increase the risk of the amount of surface runoff from any malfunction in the delivery of water to the plant locations. Additionally the water trucks connecting to the supply points at SR 136 pose an increased risk to potential runoff from leaks in the connections to the trunk lines that would be conveyed to any existing storm water collection system. However, from review of the topographical maps for the area, it is anticipated that the potential runoff would run southwest towards Owens Lake and dissipate into the soil before reaching any existing storm water drainage systems. It is not anticipated that the potential runoff would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff. Therefore, less than significant impacts under CEQA would occur relative to surface water quality, drainage, and groundwater.

4.8.3.6 ALTERNATIVE 5, DUST CONTROL MEASURES APPLIED TO 194 ACRES USING IRRIGATION WATER DELIVERED VIA KCSD WATER WELL / PIPELINE TO IRRIGATION SYSTEM AND SELECTED MANUAL WATERING

Under Alternative 5, the DCMs would be the same as the proposed project / proposed action. In Alternative 5, water obtained from the KCSD well would be transported to the project via a temporary pipeline that connects into the KCSD water system near the KCSD well site. Water would be supplied directly to the temporary irrigation system from the KCSD, in lieu of the District's Fault Test well. As with Alternatives 3 and 4, Alternative 5 would include a temporary aboveground irrigation system installed within the 95 percent control level area to provide water to the project area. Plants within the sensitive 85 percent control area would be watered by hand using the same method as described above. The ATV mounted tanks would be filled with water from the delivery system within the project.

A. Direct and Indirect Impacts

Construction

Under Alternative 5, construction activities would be essentially the same as for the proposed project / proposed action, with the exception of drilling to install a pipeline underneath SR 136 that would connect to the temporary irrigation system. The direct and indirect impacts would be similar to those outlined in the proposed project / proposed action above. Alternative 5 would not be expected to result in significant impacts to hydrology and water quality with the incorporation of the SWPPP, HMBP, and SPCCC in into the proposed project / proposed action design. The incorporation of an irrigation system would result in roughly 80 percent less ATV traffic, than that anticipated for the proposed project / proposed action. As a result there would be fewer pollutants such as oil, fuel and lubricants associated with vehicle maintenance to adversely affect water quality. The temporary irrigation system would have irrigation laterals that utilize detachable hoses to deliver water to the plant locations. The irrigation system would potentially increase the risk of the amount of surface runoff from any malfunction in the delivery of water to the plant locations. However, it is not anticipated that the potential runoff would exceed the capacity of existing storm water drainage systems or provide substantial additional sources of polluted runoff. The directional drilling used to install the pipeline underneath SR 136, has the potential to produce drill slurry discharges that could be conveyed into storm drains and in directly to receiving water bodies, however there are no receiving water bodies or storm drains in the immediate area.

Operations and Maintenance

Under Alternative 5, the dust control measures would be the same as the proposed project / proposed action (as described in Section 2.2.4). Water obtained from the KCSD would be transported to the project via water pipeline from the KCSD water system. The use of water tanks mounted on ATVs, to distribute supplemental irrigation during the operations and maintenance phase of the project, would be replaced with a temporary aboveground irrigation system that would be installed within the 95-percent control level area to provide water to the project area. Plants within the sensitive 85-percent control area would be manually watered using the same method as described proposed project/proposed action. In the environmentally sensitive areas, the ATV mounted tanks would be filled with water from the delivery system within the project instead of from trucks at the staging areas. Alternative 5 would utilize a temporary irrigation system that would have irrigation laterals that utilize detachable hoses to deliver water to the plant locations. The irrigation system would potentially increase the risk of the amount of surface runoff from any malfunction in the delivery of water to the plant locations. However, it is not anticipated that the potential runoff would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff. Alternative 5 would not be expected to result in significant impacts to hydrology and water quality.

At the completion of each irrigation event, the irrigation system would be drained. Drainage valves would be installed along each lateral line such that approximately 200 gallons of water would be drained from each lateral onto the surface, in such a way that it does not leave the Alternative 5 area. Drainage water would be directed to planted bales locations where possible.

B. CEQA Significance Determinations

Construction

(1) Violate any water quality standards or waste discharge requirements

(2) Substantially deplete groundwater supplies or interfere with groundwater recharge leading to a net deficit in aquifer volume or a lowering of the local groundwater table level (i.e., the production rate of preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)

(3) Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation either on-site or off-site

(4) Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river or substantial increase in the rate or amount of surface runoff in a manner that would result in flooding either on-site or off-site

(5) Create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff

(6) Otherwise substantially degrade water quality

(7) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map, or other flood hazard delineation map

(8) Place structures within a 100-year flood hazard area that would impede or redirect flood flows

(9) Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam

(10) Result in inundation by seiche, tsunami, or mudflow

Alternative 5 would not include any perennial water bodies within the proposed project limits nor would it involve demolition activities or building of any permanent structures or impervious surfaces. Soil erosion, sedimentation, and runoff (e.g. runoff containing grease, oil, sediment and heavy metals) shall be controlled during construction in accordance with an NPDES Construction General Permit, approved SWPPP and associated BMPs. The incorporation of an irrigation system would result in roughly 80 percent less ATV traffic, than that anticipated for the proposed project / proposed action. As a result there would be fewer pollutants such as oil, fuel and lubricants associated with vehicle maintenance to adversely affect water quality. The irrigation system would potentially increase the risk of the amount of surface runoff from any malfunction in the delivery of water to the plant locations. The District has also identified BMPs to reduce the potential for fuel spills and transport of pollutant runoff with the development of approved HMBP and SPCC. The site is not within a 100-year flood zone area. Due to the low surface gradient and the distance from the ocean and other water bodies, Alternative 5 is not subject to inundation by seiche, tsunami, or mudflow. Therefore, less than significant impacts under CEQA would occur relative to surface water quality, drainage, groundwater, 100-year flood zone, or seiche, tsunami, or mudflow.

Operations and Maintenance

(1) Violate any water quality standards or waste discharge requirements

(2) Substantially deplete groundwater supplies or interfere with groundwater recharge leading to a net deficit in aquifer volume or a lowering of the local groundwater table level (i.e., the production rate of preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)

(3) Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation either on-site or off-site

(4) Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river or substantial increase in the rate or amount of surface runoff in a manner that would result in flooding either on-site or off-site

(5) Create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff

(6) Otherwise substantially degrade water quality

(7) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map, or other flood hazard delineation map

(8) Place structures within a 100-year flood hazard area that would impede or redirect flood flows

(9) Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam

(10) Result in inundation by seiche, tsunami, or mudflow

Alternative 5 has been designed to require minimal maintenance. Activities would include maintenance of the air quality monitoring stations, supplemental watering and monitoring of plant growth and straw bale condition, and activities associated with the replacement of broken bales and dead plants. Alternative 5 elements have been designed to avoid active and inactive blue line drainages, with the exception of limited crossing by rubber-tired vehicles. The incorporation of an irrigation system would result in roughly 80 percent less ATV traffic, than that anticipated for the proposed project / proposed action. As a result there would be fewer pollutants such as oil, fuel and lubricants associated with vehicle maintenance to adversely affect water quality. The staging areas and access routes of Alternative 5 have been designed to minimize disturbance of the ground surface. Sufficient groundwater exists for use by the proposed project for the watering of the native vegetation from the KCSD well. Groundwater used for watering would not leave the Owen Lake Hydrological Basin. The temporary irrigation system would have irrigation laterals that utilize detachable hoses to deliver water to the plant locations. The irrigation system would potentially increase the risk of the amount of surface runoff from any malfunction in the delivery of water to the plant locations. However, potential flows will be of a low volume and would be confined to the project area. Therefore, less than significant impacts under CEQA would occur relative to surface water quality, drainage, and groundwater.

4.9.3.7 ALTERNATIVE 6, NO PROJECT / NO ACTION ALTERNATIVE

Under Alternative 6, No Project / No Action Alternative, no dust control measures would be implemented at the Keeler Dunes. During high wind events, the Keeler Dunes would continue to emit levels of windblown dust that cause and contribute to exceedances of the National Ambient Air Quality Standards (NAAQS) and California State standard for particulate matter (PM_{10}) air pollution including in the communities of Keeler and Swansea. In addition, under the No Project / No Action Alternative, one of the continuing dust sources in the greater Owens Lake area, would not be controlled, contributing to non-compliance in this area and non-attainment of the NAAQS for PM_{10} by 2017, as required under the 2008 State Implementation Plan.

A. Direct and Indirect Impacts

Construction

Under Alternative 6, no dust control measures would be constructed. It would not be necessary for the BLM to grant a ROW. Existing drainage pattern would remain unchanged and no potential for erosion would result from construction activities. Therefore, no direct or indirect impact associated with hydrology and water quality would occur.

Operations and Maintenance

Under the No Project / No Action Alternative, no dust control measures would be constructed. No permanent changes to drainage patterns or potential for operational erosion or storm water runoff would occur. As a result, no direct or indirect impact associated with hydrology and water quality would occur.

B. CEQA Significance Determinations

Construction

Under the No Project / No Action Alternative, no dust control measures would be constructed thereby avoiding the potential impacts such as violating a water quality standard, altering an existing drainage pattern, causing potential for soil erosion or flooding. Thus there would be no impacts, as defined by CEQA related to hydrology and water quality, that would occur from the No Project / No Action Alternative.

Operations and Maintenance

Under the No Project / No Action Alternative, the dust control measures would not be operated or maintained. No changes in existing drainage patterns or potential to increase runoff or erosion would occur. Thus, no hydrology and water quality impacts would occur with regards to operations and maintenance under CEQA resulting from No Project / No Action Alternative.

4.8.4 MITIGATION MEASURES

The proposed project / proposed action and five project/action alternatives have been designed to avoid waters of the United States and Waters of the State, where effects are limited to crossing with rubber tired vehicles and foot traffic. The project description requires that soil erosion, sedimentation, and runoff (e.g. runoff containing grease, oil, sediment, and heavy metals) shall be controlled during construction in accordance with an NPDES Construction General Permit, approved SWPPP, and associated BMPs. Therefore, implementation of the Proposed Project / Proposed Action; Alternatives 1 through 5; and Alternative 6, No Project / No Action, would not be expected to result in substantial impacts to hydrology. Therefore, no mitigation measures would be required.

4.8.5 RESIDUAL IMPACTS AFTER MITIGATION

Implementation of the proposed project / proposed action, Alternative 1, Alternative 2, Alternative 3, Alternative 4, Alternative 5, and the No Project / No Action Alternative would not result in any direct or residual impacts to hydrology and no mitigation would be required.

4.9 LAND USE AND PLANNING

4.9.1 METHODOLOGY FOR ANALYSIS

This section assesses the possible effects on land use and planning that could result from the proposed project / proposed action and alternatives. This section addresses the need for mitigation measures to reduce or avoid adverse impacts anticipated from activities resulting from the proposed project / proposed action and alternatives. A discussion of cumulative impacts related to land use and planning is included in Section 5.9. The environmental setting for land use and planning is presented in Section 3.9. The existing conditions were evaluated based on their potential to be affected by activities of the proposed project / proposed action and alternatives.

4.9.2 CEQA SIGNIFICANCE CRITERIA / NEPA REQUIREMENTS

The CEQA Significance Determinations and NEPA Requirements are discussed concurrently where applicable (i.e., with regard to CEQA Guidelines criterion). For NEPA disclosure, the impact analysis is referring to the proposed project / proposed action or alternative. Direct effects (or impacts) are those occurring in the same place and time as the proposed project / proposed action with regard to construction, and operations and maintenance. Indirect effects (or impacts) are those that could result from the proposed project / proposed action or an alternative, but are later in time or further removed in distance (for example, located several miles from the proposed project / proposed action site).

4.9.2.1 CEQA SIGNIFICANCE CRITERIA

The potential for the proposed project to result in impacts related to land use and planning was analyzed in relation to the questions contained in Appendix G of the State CEQA Guidelines.

The proposed project would normally be considered to have a substantial impact to land use and planning when any one of the following three thresholds is met:

(1) Physical division of an established community

(2) Conflict with applicable land use plans, policies, or regulations of an agency with jurisdiction over the proposed project (including but not limited to the general plan, specific plan, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect

(3) Conflict with any applicable habitat conservation plan or natural community conservation plan

4.9.2.2 NEPA REQUIREMENTS

Significance under NEPA is defined in terms of both context and intensity. Context means that the significance of an action must be analyzed in several contexts, such as society, the affected region, affected interests, and the local environment. Intensity refers to the severity of impact and includes a variety of factors to be considered (40 CFR 1508.27). Intensity factors potentially relevant to land use and planning impacts as listed in 40 CFR 1508.27 (b) include "unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands ... degree of controversy, degree of uncertainty about possible effects, degree to which an action may establish a precedent for future actions, and potential for cumulatively substantial impacts."

The following potential effect to land use and planning will serve as the basis for the NEPA analysis of the proposed action:

(1) Conflict with the management goals of any special designation area

Implementation of the proposed action would not be expected to conflict with the management goals of any special designation area. The proposed action is consistent with the goals set forth in Federal Land Policy and Management Act (FLPMA), the Bishop Resource Management Plan, and the Inyo County General Plan discussed in Section 3.9. In addition, the proposed action would have no impact on an Area of Critical Environmental Concern (ACEC) established by the BLM because the proposed action is not located within or adjacent to an ACEC.[1]

4.9.3 ENVIRONMENTAL CONSEQUENCES

4.9.3.1 PROPOSED PROJECT / PROPOSED ACTION, DUST CONTROL MEASURES APPLIED TO 194 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / ATVS

A. Direct and Indirect Impacts

The proposed project / proposed action is a program to control dust emissions in the Keeler Dunes through the use of native plants and temporary wind breaks (straw bales) applied to a total of 194 acres of the emissive deposits in the dunes. The key components of the proposed project / proposed action include placement of straw bales on the site, planting of native vegetation, preparation of staging areas, access routes, water supply, conveyance and distribution, and an effectiveness monitoring program as part of the operations phase of the proposed project / proposed action. Further details of the proposed project / proposed action are described in Section 2. The proposed project / proposed action would not have substantial direct or indirect impacts to land use and planning pursuant to CEQA significance determinations or conflict with any land use and planning goals or objectives for the proposed project / proposed action area. Additionally, the proposed project / proposed action would not restrict access or maintenance activities to the existing ROWs held by Verizon, LADWP, or Caltrans.

B. CEQA Significance Determinations

(1) Physical division of an established community

Implementation of the proposed project would not be expected to physically divide an established community because all of the DCMs would be implemented outside of the communities within the vicinity of the proposed project study area. Two communities are located in the vicinity of the proposed project study area in the unincorporated area of Inyo County (Figure 1.3.1-1, *Regional Vicinity Map*). All communities are located outside of the proposed project boundary. The community of Keeler is located 1.7 miles southeast of the center of the proposed project and adjacent to the proposed project study area, and the community of Swansea is located 1.3 miles to the north. Additionally, one designated Native American reservation (Lone Pine Paiute-Shoshone Indian Reservation) and the town of Lone Pine are approximately 10 miles to the northwest of the proposed

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[1] Lisius, S., Bureau of Land Management, Bishop Field Office. 18 October 2012. Email to Donna Grotzinger, Sapphos Environmental, Inc., Pasadena, CA. Subject: "Contact Report Form Attached."

project study area. Due to the distance of the communities from the proposed project study area, there would be no expected substantial impact with regard to the physical division of an established community.

(2) Conflict with applicable land use plans, policies, or regulations of an agency with jurisdiction over the proposed project (including but not limited to the general plan, specific plan, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect

The proposed project would not be expected to result in substantial impacts in regard to conflicts with environmentally related plans and policies in the proposed project study area. The proposed DCMs would be consistent with the Inyo County General Plan, Lower Owens River Project, Owens Valley Management Plan, Owens Lake Master Project, and other applicable local plans. The proposed project would maintain the current open space and support the preservation of natural resources while maintaining low-impact recreational opportunities.

The proposed project would be consistent with the Land Use Element of the Inyo County General Plan, particularly Goal LU-5 and Policy LU-5.4; the proposed project would support the conservation of natural resources in the Keeler Dunes and vicinity.[2] In addition, the proposed project would be consistent with Inyo County Zoning Ordinance, OS-40 Open Space Zone, because the proposed project would support the protection of areas and other mandated lands from erosion, pollution, and soil destruction.[3]

The proposed project would place straw bales and plant native vegetation to stabilize emissive dust areas in a portion of the Keeler Dunes and associated sand deposits. The implementation of the DCMs would be consistent with all other existing uses in the proposed project study area. All activities related to DCMs would primarily occur on BLM lands and LADWP lands to be leased by the District.

A large portion of the proposed dust control areas is located on BLM land for which an ROW permit is required. Securing approval from the BLM is considered to be administrative and not a substantial land use impact.

(3) Conflict with any applicable habitat conservation plan or natural community conservation plan

The proposed project would not be expected to result in impacts related to any applicable Habitat Conservation Plan (HCP) or Natural Community Conservation Plan (NCCP). No portion of the proposed project study area is included in any applicable HCP or NCCP. The Lower Owens River Project EIR discusses the potential to create an HCP for federally listed species with the potential to occur within the area of the Lower Owens River Project covered in the Draft EIR; however, the goals and objectives of the Draft EIR and any potential HCP that may result would not conflict with the proposed project analyzed in this EIR.[4] Therefore, there would be no expected impacts.

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[2] Inyo County Planning Department. December 2001. *Inyo County General Plan, Land Use Element*. Independence, CA.

[3] Inyo County. 30 June 2003. "Zoning Ordinance," Title 18, *Inyo County Code*. Independence, CA.

[4] Los Angeles Department of Water and Power. 23 June 2004. *Final Environmental Impact Report, Lower Owens River Project*. Bishop, CA.

4.9.3.2 Alternative 1, Dust Control Measures Applied to 214 Acres Using Irrigation Water Delivered via Water Trucks / ATVs

Under Alternative 1, construction would be essentially the same as for the proposed project / proposed action (as described in Section 2.2.2). The primary difference between the alternatives would be the total number of plants and straw bales that would be transported to the project site and distributed onto a larger area (20 additional acres) of dust control. Alternative 1 would result in a greater number of plants and straw bales; hence, additional workers and equipment may be necessary to complete the alternative in the same time frame as the proposed project / proposed action. As with the proposed project / proposed action, supplemental irrigation in the first 3 years following installation of native vegetation would be completed via hauling of water in small water tanks (about 150–200 gallons) mounted on a trailer and pulled with an ATV and then irrigation would be conducted by hand through a small-diameter hose.

4.9.3.3 Alternative 2, Dust Control Measures Applied to 197 Acres Using Irrigation Water Delivered via Water Trucks / ATVs

Alternative 2 has DCMs applied at different intensities in different areas of the Keeler Dunes, and the total acreage treated is 3 acres larger than the proposed project / proposed action (as described in Section 2.2.3). This alternative focuses on applying the highest intensity of dust control (95 percent control efficiency) across the Keeler Dunes and inter-dune sand sheet areas (170 acres), while applying less intensive controls on other inter-dune and sensitive cultural areas (27 acres at 90 percent dust control efficiency). The staging areas, access routes, construction scenario, and watering would remain the same as for the proposed project / proposed action; only the numbers of straw bales and plants and the area they are applied to would be increased by less than 3 percent due to the additional 3 acres to be treated. The construction scenario, access routes, staging areas and other design features would be largely the same as for the proposed project / proposed action although the area of impact would be 3 acres larger.

4.9.3.4 Alternative 3, Dust Control Measures Applied to 194 Acres Using Irrigation Water Delivered via Water Trucks / Tanks / PVC Irrigation System and Selected Manual Watering

Under Alternative 3, the DCMs would be the same as the proposed project / proposed action (as described in Section 2.2.4). Water obtained from the District's production well at the Fault Test site would be transported to the proposed project / proposed action via large water trucks to temporary storage tanks located at the three of the four designated staging areas. Since the staging areas are lower in elevation than the proposed project / proposed action area, each staging area would need to have a manifold and booster pump to pressurize the irrigation system. The use of water tanks mounted on ATVs, to distribute supplemental irrigation during the operations and maintenance phase, would be replaced with a temporary aboveground irrigation system that would be installed within the 95 percent control level area to provide water to the project area. Plants within the sensitive 85 percent control area would be manually watered using the same method as the proposed project / proposed action. In the environmentally sensitive areas, the ATV-mounted tanks would be filled with water from the delivery system within the proposed project / proposed action instead of from trucks at the staging areas.

4.9.3.5 Alternative 4, Dust Control Measures Applied to 194 Acres Using Irrigation Water Delivered via Water Trucks / PVC Irrigation System and Selected Manual Watering

Under Alternative 4, the DCMs would be the same as the proposed project / proposed action (as described in Section 2.2.5). In Alternative 4, water obtained from the Fault Test Well would be transported to the proposed project / proposed action via water trucks, and the water delivery system would be fed from three supply points along SR 136. As with Alternative 3, plants within the 95 percent control area would be watered with hoses attached to the laterals of the temporary PVC irrigation system. In this alternative, water trucks would stage next to the highway and deliver water directly into the temporary PVC irrigation system, rather than utilizing water tanks at the staging areas for temporary storage. As in Alternative 3, hand watering would be done in the sensitive 85 percent control area using hoses to deliver water from tanks mounted on ATVs, staged in a manner to avoid sensitive cultural resources. As with the temporary irrigation system, the ATV-mounted tanks would be filled with water from the delivery system within the proposed project / proposed action instead of from tanks at the staging areas.

4.9.3.6 Alternative 5, Dust Control Measures Applied to 194 Acres Using Irrigation Water Delivered via KCSD Water Well / Pipeline to Irrigation System and Selected Manual Watering

Under Alternative 5, the DCMs would be the same as the proposed project / proposed action. In Alternative 5, water obtained from the KCSD well would be transported to the proposed project / proposed action via a temporary pipeline that connects into the KCSD water system near the KCSD well site. Water would be supplied directly to the temporary irrigation system from the KCSD, in lieu of the District's Fault Test Well. As with Alternatives 3 and 4, Alternative 5 would include a temporary aboveground irrigation system installed within the 95 percent control level area. Plants within the 85 percent control area would be watered by hand using the same method as described above. The ATV-mounted tanks would be filled with water from the delivery system within the proposed project / proposed action.

4.9.3.7 Alternative 6, No Project / No Action Alternative

Alternative 6, No Project / No Action, assumes that the DMCs would not be implemented on the proposed project / proposed action site, and windblown dust and associated PM_{10} emissions would continue to pose a health hazard to the residents of the communities of Keeler and Swansea. Under Alternative 6, the NAAQS and California state standards for PM_{10} would continue to be exceeded in violation of the 2008 SIP. The sand dunes on the proposed project / proposed action site would continue to migrate to the south-southeast toward the community of Keeler, and natural resources within the dunes would continue to be affected by the shifting sands resulting from high wind events.

4.9.4 MITIGATION MEASURES

Implementation of the proposed project / proposed action would not result in substantial impacts to land use and planning; therefore, no mitigation measures would be required.

4.9.5 RESIDUAL IMPACTS AFTER MITIGATION

Implementation of the proposed project / proposed action would not result in substantial impacts to land use and planning.

4.10 RECREATION

This section examines the potential for the proposed project / proposed action to affect access to recreational facilities on BLM lands and other regional and local recreational facilities in Inyo County.

4.10.1 STUDY METHODS

This discussion identifies and analyzes the impacts of the proposed project / proposed action and alternatives on access to recreational resources on BLM lands and other federal, state, and local recreational facilities. The Bishop Resource Management Plan and Inyo County General Plan were consulted to determine the location of recreational routes and areas in the vicinity of the proposed project / proposed action site. Recreation at the proposed project / proposed action study area was evaluated with regard to state, regional, and local data, and forecasts for recreation; the Inyo County General Plan; and the Bishop Resource Management Plan.

4.10.2 CEQA SIGNIFICANCE CRITERIA / NEPA REQUIREMENTS

For purposes of the analysis, the CEQA significance determinations and NEPA requirements are discussed concurrently where applicable (i.e., with regard to CEQA Guidelines criterion). For NEPA disclosure, the impact analysis is referring to the proposed project / proposed action or an alternative. Direct effects (or impacts) are those occurring in the same place and time as the proposed project / proposed action with regard to construction and maintenance. Direct recreation impacts from the proposed project / proposed action or an alternative are related to interruption or excessive use of federal, state, or local recreational that could result from the proposed project / proposed action or an alternative, indirect impacts are those that are separated in time or space, later in time (for example after construction, or maintenance and monitoring), or further removed in distance (for example, several miles from the proposed project / proposed action site).

4.10.2.1 CEQA SIGNIFICANCE CRITERIA

The potential for the proposed project to result in impacts to recreation was analyzed in relation to the questions contained in Appendix G of the State CEQA Guidelines. Under CEQA, the potential for the proposed project or project alternatives to result in impacts related to recreation was analyzed in relation to the questions contained in Appendix G of the State CEQA Guidelines. A significant impact on recreation would normally be determined to occur if the project or project alternatives triggered one of the two thresholds established by Appendix G of the CEQA Guidelines:

(1) Increase the use of existing neighborhoods and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated

(2) The construction or expansion of recreational facilities, which might have an adverse physical effect on the environment

4.10.2.2 NEPA Requirements

Three considerations will serve as a basis for the NEPA analysis of the proposed action:

(1) Directly or indirectly disrupts recreation activities in established Federal, State, or local recreation areas and/or wilderness areas

(2) Substantially reduces the scenic, biological, cultural, geologic, or other important factors that contribute to the value of Federal, State, local, or private recreational facilities or wilderness areas

(3) Diminishes the enjoyment of existing recreational opportunities

These three potential effects are discussed for the proposed action and alternatives with regard to direct, indirect, and cumulative impacts.

4.10.3 ENVIRONMENTAL CONSEQUENCES

4.10.3.1 PROPOSED PROJECT / PROPOSED ACTION, DUST CONTROL MEASURES APPLIED TO 194 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / ATVS

A. Direct and Indirect Impacts

Construction

Established Federal, State, or Local Recreation Areas and/or Wilderness Areas. The proposed project / proposed action would not require closure or restrict access on any roads or walkways that provide access to the Keeler Dunes by Keeler residents. The proposed project / proposed action specifies the need for signage to direct individuals away from the 194 acres of active construction and the dust control areas to a corridor to the east that parallels State Route (SR) 136. Temporary restrictions with regard to passive recreation may occur during the construction phase of the proposed project / proposed action. Temporary user increases to recreational facilities within a 15-mile radius may occur due to these restrictions. There are seven recreational facilities within a 15-mile radius of the proposed project / proposed action study area (refer to Figure 3.10.2.2-1, *Nearest Recreational Facilities to the Study Area*, and Table 3.10.2.2-1, *List of Public Recreation Areas within a 1-Hour Travel Time of the Proposed Project / Proposed Action*). The nearest recreational areas are:

1. Diaz Recreational Lake Area, located approximately 9 miles northwest of the proposed project / proposed action study area (a 12–20 minute drive)
2. Spainhower Park, located approximately 11 miles northwest of the proposed project / proposed action study area (a 14–17 minute drive)
3. Portagee Joe Campground, located approximately 11 miles northwest of the proposed project / proposed action study area (a 16–19 minute drive)
4. Alabama Hills Recreation Area, located approximately 11 miles northwest of the proposed project / proposed action study area (a 25–31 minute drive)
5. Dirty Socks Hot Springs, located approximately 11.5 miles southwest of the proposed project / proposed action study area (a 17–19 minute drive)
6. Tuttle Creek Campground, located approximately 13 miles northwest of the proposed project / proposed action study area (a 29–34 minute drive)
7. Horseshoe Meadows Road Trailhead, located approximately 13 miles west of the proposed project / proposed action study area (a 52–60 minute drive).

While these facilities may experience an increase in use from the inhabitants of Keeler, the surrounding recreational areas (the Horseshoe Meadows Road Trailhead, Tuttle Creek Campground, Dirty Socks Hot Springs the Alabama Hills Recreation Area, Portagee Joe Campground, Spainhower Park, and Diaz Recreational Lake) have the capacity to absorb an increase in use. Moreover, due to their far distances, it is unexpected that these locations would serve as long-term alternate sites. Therefore, there would be no direct or adverse effect on the scenic, biological, cultural, geologic, or other important factors that contribute to the value of federal, state, local, or private recreational facilities or wilderness areas implementation of the proposed project / proposed action would not increase the use of existing neighborhoods and regional parks or other recreation facilities such that physical deterioration of the facility would occur or be accelerated.

Construction or Expansion of New Facilities. The proposed project / proposed action would not require the construction or expansion of recreation facilities, which would result in any adverse physical impacts on the environment, as the proposed project / proposed action would entail dust control measures (DCMs) that would install straw bales and utilize native vegetation as a DCM. The proposed project / proposed action does not involve construction of housing facilities, schools, or commercial buildings that would cause a rise in population, thereby alleviating the need to construct or expand any recreational facilities.

Land Use Plan Goals and Policies. The proposed project / proposed action would not conflict with any goals, policies, and regulations set forth by the Bishop Resource Management Plan, Inyo County General Plan, and the Lower Owens River Project Plan. While the proposed project / proposed action site is located 3 miles southeast of the Lower Owens River Project Boundary, the proposed project / proposed action would enhance the environmental quality of the Lower Owens River Project through the reduction of fugitive dust related pollutants in the air. Moreover, as noted in Section 4.1, *Aesthetics / Visual Resources*, the use of straw bales would result in negligible impacts with regards to aesthetics, thus preserving the scenic quality of the restored river and its surrounding environment. As a result of the proposed project / proposed action, no impacts to recreation would be expected.

Maintenance and Monitoring

As with construction, the maintenance and monitoring activities that are required during the first 3 years after the installation of the native vegetation would not exclude access to or cause excessive use of a federal, state, or local parks.

B. CEQA Significance Determinations

Construction

(1) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated

There are no neighborhood parks in the vicinity (within one-half mile) of the proposed project / proposed action. The limited size of the construction team and the short duration of the time required to install the native plants would not expected to result in an increase in use at the nearest regional park, Diaz Lake. Therefore, there would be no anticipated impact to recreation from increased use of Federal, State, or regional parks or other recreational facilities such that substantial physical deterioration of a facility would occur or be accelerated.

(2) The construction or expansion of recreational facilities, which might have an adverse physical effect on the environment

Construction of the proposed project / proposed action would not require the construction or expansion of recreation facilities; therefore, there would be no significant impact.

Maintenance and Monitoring

(1) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated

There are no neighborhood parks in the vicinity (within one-half mile) of the proposed project / proposed action. The limited size of the maintenance and monitoring team and the short 3-year duration of the time required to maintain and monitor the native vegetation would not expected to result in an increase in use at the nearest regional park, Diaz Lake. Therefore, there would be no anticipated impact to recreation from increased use of Federal, State, or regional parks or other recreational facilities such that substantial physical deterioration of a facility would occur or be accelerated.

(2) The construction or expansion of recreational facilities, which might have an adverse physical effect on the environment

Maintenance and monitoring of the proposed project / proposed action would not require the construction or expansion of recreation facilities; therefore, there would be no significant impact.

4.10.3.2 Alternative 1, Dust Control Measures Applied to 214 Acres Using Irrigation Water Delivered via Water Trucks / ATVs

Under Alternative 1, construction would be essentially the same as for the proposed project / proposed action (as described in Section 2.2.2). The primary difference between the alternatives would be the total number of plants and straw bales that would be transported to the project site and distributed onto a larger area (20 additional acres) of dust control. Alternative 1 would result in a greater number of plants and straw bales; hence, additional workers and equipment may be necessary to complete the alternative in the same time frame as the proposed project / proposed action. As with the proposed project / proposed action, supplemental irrigation in the first 3 years following installation of native vegetation would be completed via hauling of water in small water tanks (about 150–200 gallons) mounted on a trailer and pulled with an ATV and then irrigation would be conducted by hand through a small-diameter hose.

A. Direct and Indirect Impacts

As with the proposed project / proposed action, there are no recreation facilities within Alternative 1 and access for passive recreation would be maintained to the surrounding areas; therefore, construction and operation of Alternative 1 would not result in impacts to recreation or require the construction of new recreation facilities.

B. CEQA Significance Determinations

Construction, Maintenance, and Monitoring

(1) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated

As with the proposed project / proposed action, there are no neighborhood parks in the vicinity of the Alternative 1 site. As with the proposed project / proposed action, Alternative 1 involves construction and maintenance and monitoring activities that would require a crew of limited size, and the time required for installation and maintenance and monitoring of the plants is of short duration and would not be expected to result in an increase in use at the nearest regional park, Diaz Lake. Therefore, there would be no anticipated impact to recreation from Alternative 1 related to increased use of federal, state, or regional parks or other recreational facilities such that substantial physical deterioration of a facility would occur or be accelerated.

(2) The construction or expansion of recreational facilities, which might have an adverse physical effect on the environment

Construction, maintenance, and monitoring of Alternative 1 would not require the construction or expansion of recreation facilities; therefore, there would be no significant impact.

4.10.3.3 Alternative 2, Dust Control Measures Applied to 197 Acres Using Irrigation Water Delivered via Water Trucks / ATVs

Alternative 2 has DCMs applied at different intensities in different areas of the Keeler Dunes, and the total acreage treated is 3 acres larger than the proposed project / proposed action (as described in Section 2.2.3). This alternative focuses on applying the highest intensity of dust control (95 percent control efficiency) across the Keeler Dunes and inter-dune sand sheet areas (170 acres), while applying less intensive controls on other inter-dune and sensitive cultural areas (27 acres at 90 percent dust control efficiency). The staging areas, access routes, construction scenario, and watering would remain the same as for the proposed project / proposed action; only the numbers of straw bales and plants and the area they are applied to would be increased by less than 3 percent due to the additional 3 acres to be treated. The construction scenario, access routes, staging areas and other design features would be largely the same as for the proposed project / proposed action although the area of impact would be 3 acres larger.

A. Direct and Indirect Impacts

As with the proposed project / proposed action, there are no recreation facilities within the Alternative 2 site and access for passive recreation would be maintained to the surrounding areas; therefore, construction and operation of Alternative 2 would not result in impacts to recreation or require the construction of new recreation facilities.

B. CEQA Significance Determinations

Construction, Maintenance, and Monitoring

(1) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated

As with the proposed project / proposed action, there are no neighborhood parks in the vicinity of the Alternative 2 site. As with the proposed project / proposed action, Alternative 2 would involve construction, maintenance, and monitoring activities that require a crew of limited size, and the time required for installation and maintenance and monitoring of the plants is of short duration and would not expected to result in an increase in use at the nearest regional park, Diaz Lake. Therefore, there would be no anticipated impact to recreation from Alternative 2 related to increased use of Federal, State, or regional parks or other recreational facilities such that substantial physical deterioration of a facility would occur or be accelerated.

(2) The construction or expansion of recreational facilities, which might have an adverse physical effect on the environment

Construction, maintenance, and monitoring of Alternative 2 would not require the construction or expansion of recreation facilities; therefore, there would be no significant impact.

4.10.3.4 Alternative 3, Dust Control Measures Applied to 194 Acres Using Irrigation Water Delivered via Water Trucks / Tanks / PVC Irrigation System and Selected Manual Watering

Under Alternative 3, the DCMs would be the same as the proposed project / proposed action (as described in Section 2.2.4). Water obtained from the District's production well at the Fault Test site would be transported to the proposed project / proposed action via large water trucks to temporary storage tanks located at the three of the four designated staging areas. Since the staging areas are lower in elevation than the proposed project / proposed action area, each staging area would need to have a manifold and booster pump to pressurize the irrigation system. The use of water tanks mounted on ATVs, to distribute supplemental irrigation during the operations and maintenance phase, would be replaced with a temporary aboveground irrigation system that would be installed within the 95 percent control level area to provide water to the project area. Plants within the sensitive 85 percent control area would be manually watered using the same method as the proposed project / proposed action. In the environmentally sensitive areas, the ATV-mounted tanks would be filled with water from the delivery system within the proposed project / proposed action instead of from trucks at the staging areas.

A. Direct and Indirect Impacts

As with the proposed project / proposed action, there are no recreation facilities within the Alternative 3 site and access for passive recreation would be maintained to the surrounding areas; therefore, construction and operation of Alternative 3 would not result in impacts to recreation or require the construction of new recreation facilities.

B. CEQA Significance Determinations

Construction, Maintenance, and Monitoring

(1) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated

As with the proposed project / proposed action, there are no neighborhood parks in the vicinity of the Alternative 3 site. As with the proposed project / proposed action, Alternative 3 would involve construction, monitoring, and maintenance activities that require a crew of limited size, and the time required for installation, maintenance, and monitoring of the plants is of short duration and would not expected to result in an increase in use at the nearest regional park, Diaz Lake. Therefore, there would be no anticipated impact to recreation from Alternative 3 related to increased use of Federal, State, or regional parks or other recreational facilities such that substantial physical deterioration of a facility would occur or be accelerated.

(2) The construction or expansion of recreational facilities, which might have an adverse physical effect on the environment

Construction, maintenance, and monitoring of Alternative 3 would not require the construction or expansion of recreation facilities; therefore, there would be no significant impact.

4.10.3.5 Alternative 4, Dust Control Measures Applied to 194 Acres Using Irrigation Water Delivered via Water Trucks / PVC Irrigation System and Selected Manual Watering

Under Alternative 4, the DCMs would be the same as the proposed project / proposed action (as described in Section 2.2.5). In Alternative 4, water obtained from the Fault Test Well would be transported to the proposed project / proposed action via water trucks, and the water delivery system would be fed from three supply points along SR 136. As with Alternative 3, plants within the 95 percent control area would be watered with hoses attached to the laterals of the temporary PVC irrigation system. In this alternative, water trucks would stage next to the highway and deliver water directly into the temporary PVC irrigation system, rather than utilizing water tanks at the staging areas for temporary storage. As in Alternative 3, hand watering would be done in the sensitive 85 percent control area using hoses to deliver water from tanks mounted on ATVs, staged in a manner to avoid sensitive cultural resources. As with the temporary irrigation system, the ATV-mounted tanks would be filled with water from the delivery system within the proposed project / proposed action instead of from tanks at the staging areas.

A. Direct and Indirect Impacts

As with the proposed project / proposed action, there are no recreation facilities within the Alternative 4 site and access for passive recreation would be maintained to the surrounding areas; therefore, construction and operation of Alternative 4 would not result in impacts to recreation or require the construction of new recreation facilities.

B. CEQA Significance Determinations

<u>Construction, Maintenance, and Monitoring</u>

(1) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated

As with the proposed project / proposed action, there are no neighborhood parks in the vicinity of the Alternative 4 site. As with the proposed project / proposed action, Alternative 4 involves construction, monitoring, and maintenance activities that require a crew of limited size, and the time required for installation and maintenance and monitoring of the plants is of short duration and would not expected to result in an increase in use at the nearest regional park, Diaz Lake. Therefore, there would be no anticipated impact to recreation from Alternative 4 related to increased use of Federal, State, or regional parks or other recreational facilities such that substantial physical deterioration of a facility would occur or be accelerated.

(2) The construction or expansion of recreational facilities, which might have an adverse physical effect on the environment

Construction, maintenance, and monitoring of Alternative 4 would not require the construction or expansion of recreation facilities; therefore, there would be no significant impact.

4.10.3.6 ALTERNATIVE 5, DUST CONTROL MEASURES APPLIED TO 194 ACRES USING IRRIGATION WATER DELIVERED VIA KCSD WATER WELL / PIPELINE TO IRRIGATION SYSTEM AND SELECTED MANUAL WATERING

Under Alternative 5, the DCMs would be the same as the proposed project / proposed action. In Alternative 5, water obtained from the KCSD well would be transported to the proposed project / proposed action via a temporary pipeline that connects into the KCSD water system near the KCSD well site. Water would be supplied directly to the temporary irrigation system from the KCSD, in lieu of the District's Fault Test Well. As with Alternatives 3 and 4, Alternative 5 would include a temporary aboveground irrigation system installed within the 95 percent control level area. Plants within the 85 percent control area would be watered by hand using the same method as described above. The ATV-mounted tanks would be filled with water from the delivery system within the proposed project / proposed action.

A. Direct and Indirect Impacts

As with the proposed project / proposed action, there are no recreation facilities within the Alternative 5 site and access for passive recreation would be maintained to the surrounding areas; therefore, construction and operation of Alternative 5 would not result in impacts to recreation or require the construction of new recreation facilities.

B. CEQA Significance Determinations

Construction, Maintenance, and Monitoring

(1) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated

As with the proposed project / proposed action, there are no neighborhood parks in the vicinity of the Alternative 5 site. As with the proposed project / proposed action, Alternative 5 involves construction, monitoring, and maintenance activities that require a crew of limited size, and the time required for installation and maintenance and monitoring of the plants is of short duration and would not expected to result in an increase in use at the nearest regional park, Diaz Lake. Therefore, there would be no anticipated impact to recreation from Alternative 5 related to increased use of Federal, State, or regional parks or other recreational facilities such that substantial physical deterioration of a facility would occur or be accelerated.

(2) The construction or expansion of recreational facilities, which might have an adverse physical effect on the environment

Construction, maintenance, and monitoring of Alternative 5 would not require the construction or expansion of recreation facilities; therefore, there would be no significant impact.

4.10.3.7 Alternative 6, No Project / No Action Alternative

Alternative 6, No Project / No Action Alternative, assumes that the DCMs would not be installed. Alternative 6 would not require a federal approval as no BLM land would be crossed. Under CEQA, continuation of existing passive recreation uses would be expected consistent with allowable uses prescribed by the Bishop Resource Management Plan and the Inyo County General Plan and Land Use Ordinance designations.

A. Direct and Indirect Impacts

Under Alternative 6, there would be no installation or maintenance activities; therefore, there would be no potential for direct or indirect impacts to federal, state, regional, or neighborhood recreation resources.

B. CEQA Significance Determinations

Under Alternative 6, there would be no impacts to federal, state, regional, or neighborhood recreation resources.

4.10.4 Mitigation Measures

The proposed project / proposed action description requires the installation of a sign program during construction and the maintenance and monitoring phases of the proposed project / proposed action to direct passive recreation users to open space areas in the Keeler Dunes outside the proposed project / proposed action area. Implementation of the proposed project / proposed action, Alternatives 1 through 5, or Alternative 6 would not be expected to result in substantial impacts to recreation. Therefore, no mitigation measures would be required.

4.10.5 RESIDUAL IMPACTS AFTER MITIGATION

Implementation of the proposed project / proposed action or alternatives would not result in any direct or residual impacts to access to recreational areas, and no mitigation would be required.

4.11 TRANSPORTATION AND TRAFFIC

This section discusses the transportation and access impacts that would occur with implementation of the proposed project / proposed action and alternatives. Impacts may occur from introduction of construction-related traffic on local roads. Information contained in this section is summarized from the Traffic Impact Study (Appendix H of this EIR/EA).

4.11.1 STUDY METHODS

This section assesses the possible effects of transportation and traffic that could result from the proposed project / proposed action and its alternatives. This analysis takes into consideration the avoidance measures that have been incorporated in to the proposed project / proposed action description for the proposed project / proposed action and its alternatives. Furthermore, this analysis only considers traffic and impacts to existing highways. No travel within the proposed project / proposed action area was included.

In order to estimate the traffic impact characteristics of the proposed project / proposed action, a multi-step process has been utilized:

- Step 1: Trip generation
- Step 2: Trip distribution
- Step 3: Traffic assignment
- Step 4: Expected future traffic volumes with and without forecast proposed project / proposed action traffic

4.11.1.1 TRIP GENERATION

Traffic generation is expressed in vehicle trip ends, defined as one-way vehicular movements, either entering or exiting the generating land use. Traffic volumes to be generated by the proposed project / proposed action were forecast for the weekday AM and PM peak hours and over a 24-hour period. The weekday AM and PM peak hours reflect the peak one hour during the traditional commuting peak periods of 7:00 to 9:00 AM and 4:00 to 6:00 PM.

Based on review of the planned proposed project / proposed action components, the peak period of activities was analyzed as occurring during the Planting and Watering period phase of the construction activities.

Workers

- Up to 72 workers including planting crews, watering crews, cultural monitors, etc., would be on-site on a daily basis.
- Workers would be present at the proposed project / proposed action site between 7:00 a.m. and 5:00 p.m., Monday through Saturday. Thus, workers are assumed to arrive prior to the AM peak period. During periods of high temperature, work may begin as early as 5:00 a.m.
- A total of 2.5 construction personnel trips per day would be made to/from the proposed project / proposed action site.

- Conservatively, each worker was assumed to arrive at the site via single occupancy vehicle.

Heavy Equipment

- Heavy equipment (e.g., ATVs, forklifts, etc.) associated with this construction period would be on the site at any given time.
- The majority of all equipment would be left on-site for the duration of construction.
- The transport of the equipment to the proposed project / proposed action site, including the hauling of pipelines, may result in a one-time, temporary, short-term impact, and are not included in the trip generation forecasts.

Delivery of Plants

- A total of 3,000 plants would be delivered on a daily basis 6 days a week.
- It is assumed 1,000 plants would be delivered in semi-trailer trucks for a total of three (3) trucks per day. This would result in plant deliveries, and therefore physical planting, occurring over at least a four month period.
- In order to provide a conservative forecast, it is also assumed that the delivery of plants during this construction period would occur during the AM peak hour. However, during project implementation plant deliveries may occur at different times of the day depending on transportation needs from the nurseries.
- A 2.5 passenger car equivalency (PCE) factor was used.

Water Trucks

- Up to three watering events would occur in the first year and two in each of the following two years.
- Each supplemental watering event for the proposed project / proposed action is anticipated to occur over a 10-15 week period.
- Water would be delivered via 8,000-gallon capacity water trucks to the staging areas for the proposed project / proposed action and three of the action alternatives. In one action alternative water would be delivered from water trucks directly to the supplemental irrigation system. In one alternative, water be delivered directly to the supplemental irrigation system via a water pipeline form the KCSD well, thus eliminating the need for water trucks.
- A maximum of 6 trips would be undertaken on a single day, over a period of up to 8 days.

4.11.1.2 TRIP DISTRIBUTION AND ASSIGNMENT

Proposed project / proposed action-related (construction and subsequent operation) traffic volumes both entering and exiting the site have been distributed and assigned to the adjacent roadway system based on the following five considerations:

- The site's proximity to major traffic corridors (i.e., U.S. Highway 395, SR 136, SR 190)
- Expected localized traffic flow patterns based on adjacent roadway channelization and presence of traffic signals

- Existing intersection traffic volumes
- Ingress/egress availability at the proposed project / proposed action site assuming use of the existing gravel haul road at SR 136 and the Old State Highway for all proposed project / proposed action-related truck and employee access
- The location of the proposed project / proposed action study area

4.11.1.3 DIRECT AND INDIRECT IMPACTS

The analysis of the potential impacts was based on a five-step process, beginning with the characterization of the existing conditions and modeling the effects of construction traffic and the effectiveness of avoidance measures, included in the proposed project / proposed action description, to ensure consistency with the goals and policies of the Inyo County RTP and the Inyo County General Plan:

a) Existing conditions (data provided in Section 3.11.2.1, Existing Circulation Elements)
b) Existing plus proposed project / proposed action conditions (i.e., traffic generation during peak activities during proposed project / proposed action construction)
c) Condition (b) with implementation of proposed project / proposed action mitigation measures, where necessary
d) Condition (a) plus 2.0 percent (2.0%) ambient traffic growth through year 2014 (i.e., 1 percent per year)
e) Condition (d) plus proposed project / proposed action conditions (i.e., traffic generation during peak activities during proposed project / proposed action construction)
f) Condition (e) with implementation of proposed project / proposed action avoidance measures, as specified in the proposed project / proposed action description

The traffic volumes for each new condition were added to the volumes in the prior condition to determine the change in utilization and corresponding LOS at the study locations.

4.11.2 CEQA SIGNIFICANCE CRITERIA / NEPA REQUIREMENTS

The CEQA Significance Determinations and NEPA Requirements are discussed concurrently where applicable (i.e. with regard to CEQA Guidelines criterion). For NEPA disclosure, the impact analysis is referring to the proposed project / proposed action or alternative. Direct effects (or impacts) are those occurring in the same place and time as the proposed project / proposed action with regard to construction, and operations and maintenance. Indirect effects (or impacts) are those that could result from the proposed project / proposed action or an alternative, but are later in time or further removed in distance (for example, located miles from the proposed project / proposed action site).

4.11.2.1 CEQA SIGNIFICANCE CRITERIA

The potential for the proposed project to result in impacts to transportation and traffic was analyzed in relation to the questions contained in Appendix G of the State CEQA Guidelines. Under CEQA, ,the potential for the proposed project or project alternatives to result in impacts related to transportation and traffic was analyzed in relation to the questions contained in Appendix G of the State CEQA Guidelines. A significant impact on transportation and traffic would normally be determined to occur if the project or project alternatives triggered one of the six thresholds established by Appendix G of the CEQA Guidelines:

(1) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit

(2) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways

(3) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks

(4) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)

(5) Result in inadequate emergency access

(6) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities

4.11.2.2 NEPA REQUIREMENTS

NEPA does not provide any standards specific to transportation. Nor has the federal government established any standards for congestion as this is a matter of local preference.

4.11.3 ENVIRONMENTAL CONSEQUENCES

This section analyzes the potential for significant direct and indirect on transportation and circulation that would occur from implementation of the proposed project / proposed action.

4.11.3.1 PROPOSED PROJECT / PROPOSED ACTION, DUST CONTROL MEASURES APPLIED TO 194 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / ATVS

A. Direct and Indirect Impacts

Level of Service

A proposed project / proposed action's transportation and circulation impacts can be separated into short-term impacts due to construction and long-term permanent impacts from proposed project / proposed action operations. It was determined that it would be appropriate to forecast the trips generated by the proposed project / proposed action based on the planned components of the proposed project / proposed action (Table 4.11.3.1-1, *Proposed Project / Proposed Action Trip Generation*).

TABLE 4.11.3.1-1
PROPOSED PROJECT / PROPOSED ACTION TRIP GENERATION

Land Use	Size	Daily Trip End (2) Volumes	AM Peak Hour Volumes (2)			PM Peak Hour Volumes (2)		
			In	Out	Total	In	Out	Total
Workers								
Approximate number of workers (3)	72 employees	158	—	—	—	0	72	72
Delivery of Plants								
Number of semi-trailer trucks (4)	3 trucks	16	8	8	16	—	—	—
Total		174	8	8	16	0	72	72

Notes:

1. The proposed project / proposed action trip generation forecast is based on the peak period of activities in terms of truck arrival/departures and number of workers at the site. Based on review of the planned proposed project / proposed action components, the peak period of activities would occur during the Planting and Watering period for construction of the proposed project / proposed action.
2. Trips are one-way traffic movements, entering or leaving.
3. The proposed project / proposed action trip generation forecasts for the Workers component during the Planting and Watering period for construction of the proposed project / proposed action is based on the following data and assumptions:
   - A total of up to 72 workers including planting crews, watering crews, cultural monitors, etc., would be on-site on a daily basis.
   - Workers would be present at the proposed project / proposed action site between 7:00 AM and 5:00 PM, Monday through Saturday. Thus, workers are assumed to arrive prior to the AM peak period. During periods of high temperature, work may begin as early as 5:00 a.m.
   - It is assumed that 2.5 construction personnel trips per day would be to/from the proposed project / proposed action site for the daily traffic volume forecast.
   - It is also conservatively assumed that each worker arrives via single occupancy vehicle.
4. The proposed project / proposed action trip generation forecasts for the Delivery of Plants during the Planting and Watering period for construction of the proposed project / proposed action is based on the following data and assumptions:
   - A total of 3,000 plants would be delivered on a daily basis 6 days a week.
   - It is assumed 1,000 plants would be delivered in semi-trailer trucks for a total of three (3) trucks per day.
   - In order to provide a conservative forecast, it is also assumed that the delivery of plants during this construction period would occur during the AM peak hour.
   - A 2.5 passenger car equivalency (PCE) factor has been assumed for semi-trailer trucks used for delivery of plants to the proposed project / proposed action site.

Level of Service (LOS) is a qualitative measure of traffic operating conditions whereby a letter grade A through F, corresponding to progressively worsening operating conditions, is assigned to an intersection or roadway segment. LOS A, B, and C are generally considered satisfactory to most motorists, while LOS D is marginally acceptable. LOS E and F are associated with severe congestion and delay, and are unacceptable to most motorists. LOS was calculated for the existing condition, existing with proposed project / proposed action, future without proposed project / proposed action, and future with proposed project / proposed action conditions (Table 4.11.3.1-2, *LOS Calculations*) for the proposed project / proposed action and the five alternatives.

TABLE 4.11.3.1-2
LOS CALCULATIONS

	Proposed Project / Proposed Action (194 acres) Water Truck / ATVs	Alternative 1 (214 acres) Water Trucks / ATVs	Alternative 2 (197 acres) Water Trucks / ATVs	Alternative 3 (194 acres) Water Trucks/Tanks PVC Irrigation System Selected Manual	Alternative 4 (194 acres) Water Trucks/Roadside PVC Irrigation System Selected Manual	Alternative 5 (194 acres) KCD Pipeline PVC Irrigation System Selected Manual	Alternative 6 No Project / No Action
Existing Condition US 395 SR 136 SR 190	LOS A/D LOS A LOS A	LOS A/D LOS A LOS A	LOS A/D LOS A LOS A	LOS A/D LOS A LOS A	LOS A/D LOS A LOS A	LOS A/D LOS A LOS A	LOS A/D LOS A LOS A
Existing with Proposed Project / Proposed Action US 395 SR 136 SR 190	LOS A/D LOS A LOS A	LOS A/D LOS A LOS A	LOS A/D LOS A LOS A	LOS A/D LOS A LOS A	LOS A/D LOS A LOS A	LOS A/D LOS A LOS A	LOS A/D LOS A LOS A
Future Without Proposed Project / Proposed Action US 395 SR 136 SR 190	LOS A/D LOS A LOS A	LOS A/D LOS A LOS A	LOS A/D LOS A LOS A	LOS A/D LOS A LOS A	LOS A/D LOS A LOS A	LOS A/D LOS A LOS A	LOS A/D LOS A LOS A
Future with Proposed Project / Proposed Action US 395 SR 136 SR 190	LOS A/D LOS A LOS A	LOS A/D LOS A LOS A	LOS A/D LOS A LOS A	LOS A/D LOS A LOS A	LOS A/D LOS A LOS A	LOS A/D LOS A LOS A	LOS A/D LOS A LOS A

For purposes of this EIR, LOS C is considered the minimum acceptable standard for roadway segments as identified in the Inyo County General Plan. Degradation of roadway segment LOS below an adopted County standard or concept is a potentially significant impact.

The results of the four-step traffic impacts analysis are summarized in this EIR/EA. The existing conditions (Step 1) is located in Section 3.11.

Existing with Proposed Project / Proposed Action Conditions (Steps 2 and 3)

As the Planting and Watering period for construction of the proposed project / proposed action results in the highest level of overall vehicle trip generation, the existing with proposed project / proposed action conditions analysis only considers this period of the proposed project / proposed action. In order to provide a conservative worst-case analysis, all 174 daily vehicle trips anticipated to be generated by the proposed project / proposed action during this construction phase were assigned to each highway in the proposed action vicinity.

U.S. Highway 395. This AADT volume is well below the capacity of the four-lane section of the highway, extending between SR 136 and SR 190. U.S Highway 395 would continue to operate at LOS A under existing with proposed project / proposed action conditions for the four-lane section of the highway. However, as noted in the Olancha/Cartago Four-Lane Project MND/EA, the two-lane section of the highway near the communities of Cartago and Olancha would continue to operate at LOS D with the addition of temporary construction proposed project / proposed action-related traffic, but would operate at LOS A upon completion of the four-lane high improvement project.

State Route 136. The AADT volumes along SR 136 with the addition of temporary construction proposed project / proposed action-related traffic would range from approximately 719 vehicles east of U.S. Highway 395 to approximately 609 vehicles near SR 190 at the Olancha cutoff. SR 136 would continue to operate at LOS A in the existing with proposed project / proposed action conditions.

State Route 190. The AADT volume along SR 190 with the addition of temporary construction proposed project / proposed action-related traffic would range from approximately 404 vehicles both east of U.S. Highway 395 and west of SR 136. SR 190 would continue to operate at LOS A in the existing with proposed project / proposed action conditions.

Future without Proposed Project / Proposed Action Conditions (Step 3)

The following subsections present a summary of the future without proposed project / proposed action conditions at each of the roadway segments included as part of this traffic analysis. In order to forecast the future without proposed project / proposed action traffic volumes, the year 2012 existing traffic volumes were increased by 2.0 percent (2.0%) to reflect year 2014 future without proposed project / proposed action traffic volumes. This ambient traffic growth factor was based on traffic trend data provided in the *2011 Traffic Volumes on California State Highway System*[1] (i.e., year 2006 to 2011 annual traffic volume data) and traffic data provided in recent environmental documents. It is noted that based on review of the most recent three year reporting periods in the Caltrans document decreasing traffic volumes for state highway travel (e.g., year 2011 over 2011 was –1.1 percent) are indicated. Thus, application of the above annual growth factor is intended to account for both known and unknown related projects in the vicinity of the proposed project / proposed action, as well as any

[1] California Department of Transportation. August 2012. *2011 Traffic Volumes on California State Highway System*. Sacramento, CA.

potential regional ambient traffic growth during the period when the proposed project / proposed action is under construction.

U.S. Highway 395. The future without proposed project / proposed action AADT volume on U.S. Highway 395 between SR 136 and SR 190 would vary between approximately 5,615 and 6,035 vehicles per day, respectively. This AADT volume is well below the capacity of the four-lane section of the highway, extending between SR 136 and SR 190. U.S Highway 395 would continue to operate at LOS A in the future without proposed project / proposed action conditions for the four-lane section of the highway. However, as noted in the Olancha/Cartago Four-Lane Project MND/EA, the two-lane section of the highway near the communities of Cartago and Olancha would continue to operate at LOS D in the future without proposed project / proposed action conditions, but would operate at LOS A upon completion of the four-lane highway improvement project.

State Route 136. The future without proposed project / proposed action AADT volume along SR 136 would range from approximately 560 vehicles east of U.S. Highway 395 to approximately 445 vehicles near SR 190 at the Olancha cutoff. SR 136 would continue to operate at LOS A in the future without proposed project / proposed action conditions.

State Route 190. The future without proposed project / proposed action AADT volume along SR 190 would range from approximately 240 vehicles both east of U.S. Highway 395 and west of SR 136. SR 190 would continue to operate at LOS A in the future without proposed project / proposed action conditions.

Future with Proposed Project / Proposed Action Conditions (Step 4)

As the Planting and Watering period for construction of the proposed project / proposed action results in the highest level of overall vehicle trip generation, the future with proposed project / proposed action conditions analysis only considers this period of the proposed project / proposed action. In order to provide a conservative worst-case analysis, all 174 daily vehicle trips anticipated to be generated by the proposed project / proposed action during this construction phase were assigned to each highway in the proposed project / proposed action vicinity.

U.S. Highway 395. The future with proposed project / proposed action AADT volume on U.S. Highway 395 between SR 136 and SR 190 would vary between approximately 5,789 and 6,209 vehicles per day, respectively. This AADT volume is well below the capacity of the four-lane section of the highway, extending between SR 136 and SR 190. U.S Highway 395 would continue to operate at LOS A in the future with proposed project / proposed action conditions for the four-lane section of the highway. However, as noted in the Olancha/Cartago Four-Lane Project MND/EA, the two-lane section of the highway near the communities of Cartago and Olancha would continue to operate at LOS D in the future with proposed project / proposed action conditions, but would operate at LOS A upon completion of the four-lane highway improvement project.

State Route 136. The future with proposed project / proposed action AADT volume along SR 136 would range from approximately 734 vehicles east of U.S. Highway 395 to approximately 619 vehicles near SR 190 at the Olancha cutoff. SR 136 would continue to operate at LOS A in the future with proposed project / proposed action conditions.

State Route 190. The future with proposed project / proposed action AADT volume along SR 190 would range from approximately 414 vehicles both east of U.S. Highway 395 and west of SR 136. SR

190 would continue to operate at LOS A in the future with proposed project / proposed action conditions.

Hazardous Roadway Design

The proposed project / proposed action would not require any changes to the existing design of the roadway network or increase incompatible uses. However, the periodic events during which equipment is hauled to the site may result in safety hazards associated with other oncoming or turning vehicles on U.S. Highway 395, SR 136, and SR 190. In addition, heavy trucks transporting material and equipment may damage the roadway surface of SR 136. The approximate number of proposed project / proposed action-related equipment used on site by the crew would total up to 45 pieces (including dozers, loaders, crew pickups, ATVs for planting and watering a water truck, and trucks for plant delivery) of which the majority would be left on site during construction. The proposed project / proposed action includes the requirement to obtain an encroachment permit from Caltrans and preparation of a Traffic Control Plan to ensure the safe transport of equipment and materials in a manner that safeguards vehicular traffic on US 395, SR 136, and SR 190.

A temporary access route for ATV travel would be constructed for use during placement of straw bales and planting and watering activities. The temporary access route from all of the staging areas will be approximately 13,478.7 feet long (2.5 miles) by 20 feet wide following the existing grade (total temporary access route disturbance area is 6 acres). The temporary access route would be constructed without the use of supplemental materials such as asphalt or gravel. Once the plants are fully established, the temporary access route would be restored utilizing straw bales and native plants for the dust control areas of the proposed project / proposed action. However, these new access routes would not cause an impact in terms of hazardous roadway conditions.

Emergency Vehicle Access/Egress

The proposed project / proposed action would not result in impacts to transportation and traffic in relation to inadequate emergency access. SR 190 and SR 136 operate at LOS A, immediately adjacent to the proposed project / proposed action area in the Future with proposed project / proposed action condition. Thus, the construction and operations phases of the proposed project / proposed action would not adversely affect the capacity of the local highways to accommodate vehicular traffic during an emergency response or evacuation. Therefore, there would be no expected impacts to transportation and traffic related to inadequate emergency access on the surrounding highway system.

Parking Capacity

The proposed project / proposed action would not result in impacts to transportation and traffic in relation to inadequate parking capacity. Limited parking would be provided on the proposed project / proposed action site to accommodate routine maintenance and monitoring vehicles. During construction, employees will park in the main staging area (Staging Area 2), east of the Old State Highway. Therefore, the proposed project / proposed action would not impact transportation and traffic related to inadequate parking capacity.

Alternative Transportation

The proposed project / proposed action would not result in impacts to transportation and traffic in relation to adopted policies, plans, or programs supporting alternative transportation. There are no existing or planned facilities for public transit, bicycles, or pedestrians in the vicinity of the proposed project / proposed action. Therefore, the proposed project / proposed action would not result in a significant adverse impact related to adopted policies, plans, or programs supporting alternative transportation.

Air Traffic Patterns

Due to the distance between the proposed project / proposed action site and the nearest public or private airport, as described earlier, and the types of uses associated with the proposed project / proposed action, no impacts to traffic and transportation related to a change in air traffic patterns that result in substantial safety risks are expected to occur.

B. CEQA Significance Determinations

Would the proposed project:

(1) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

(2) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

Construction

As shown in Table 4.11.3.1-2, the proposed project would not substantially increase traffic volumes under Year 2012 Plus Proposed Project / Proposed Action Conditions. Intersection LOS calculations are included in Appendix H. All study area highway segments would continue to operate at LOS A. Likewise construction traffic on roadway and freeway segments would not exceed V/C ratios. Therefore, construction traffic impacts under Year 2012 Plus Proposed Action Conditions are considered less than significant under CEQA.

Operations and Maintenance

Operations and maintenance traffic would consist of hauling water in water trucks and transporting water within the project area using ATVs during the 3 years following completion of the installation of plants and straw bales. Additional trips would be limited to workers trips from Keeler to the site to conduct monitoring of wind data and the vegetation establishment. It is anticipated that up to two supplemental irrigation events would be undertaken in each of the 3 years following plant installation. Each watering event would require about 46 water truck round-trips over a period of 10 weeks. Water would be delivered using 8,000-gallon capacity water trucks to the temporary staging areas 1, 2, and 3. Each watering event would include up to 46 trips, for a total of 92 trips per year.[2] This is substantially lower than the truck trips analyzed for the construction phase of the proposed project / proposed action. As with the construction phase of the proposed project / proposed action, the water truck trips required for operations and maintenance would not adversely impact traffic conditions. Similarly, the supplemental watering activities would be expected to be limited to a maximum of 10 personnel on a

[2] This assumes up to two watering events each year.

given day; substantially lower than the 72 personnel analyzed for the construction phase of the proposed project / proposed action. As with the proposed project / proposed action, vehicle trips required to support monitoring during the operations and maintenance phase would not adversely impact traffic. All study area highway segments would continue to operate at LOS A. Likewise construction traffic on roadway and freeway segments would not exceed V/C ratios. Therefore, traffic impacts related to operations and maintenance under Year 2012 Plus Proposed action Conditions are considered less than significant under CEQA.

(3) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

Construction / Operations and Maintenance

The proposed project would not affect air traffic patterns or air traffic levels; therefore there are no impacts to transportation and traffic related to air traffic.

(4) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Construction / Operations and Maintenance

Construction does not involve any roadway design elements with the exception of use of the existing access route (haul road) turnouts to the proposed project site. During construction, access to the proposed project would be provided from SR 136. Trips are substantially reduced during the operations and maintenance phase of the proposed project. As with the construction phase, access would be provided from SR 136 using an existing access route (haul road) and the Old State Highway. The Old State Highway is an unpaved road that would require minimal maintenance due to dust build up from the lakebed.

Potential impacts associated with driveways encroaching on California Department of Transportation (Caltrans) right-of-ways would be addressed by obtaining a Caltrans encroachment permit to protect public safety. In addition, any work requiring traffic control on SR 136 would be conducted in accordance with a traffic control plan approved by Caltrans. Therefore, compliance with Caltrans requirements would reduce the potential for direct impacts associated with design features to below the level of significance.

(5) Result in inadequate emergency access?

Construction / Operations and Maintenance

Emergency access to the proposed project site during the construction and operations and maintenance phases of the proposed project would be provided from SR 136. No direct or indirect impacts are anticipated to occur with regard to emergency access during construction.

(6) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

Construction / Operations and Maintenance

There are no existing or proposed facilities for public transit, bicycles or pedestrians in the vicinity of the proposed project; therefore there are no impacts to such facilities.

4.11.3.2 Alternative 1, Dust Control Measures Applied to 214 Acres Using Irrigation Water Delivered via Water Trucks / ATVs

Under Alternative 1, construction would be essentially the same as for the proposed project / proposed action (as described in Section 2.2.2). The primary difference would be the total number of plants and straw bales that would be transported to the project site and distributed onto a larger area (20 additional acres) of dust control. Alternative 1 would result in a greater number of plants and straw bales; hence, additional workers and equipment may be necessary to complete the alternative in the same time frame as the proposed project / proposed action. As with the proposed project / proposed action, supplemental irrigation in the first 3 years following installation of native vegetation would be completed via hauling of water in small water tanks (about 150–200 gallons) mounted on a trailer and pulled with an ATV and then irrigation would be conducted by hand through a small diameter hose.

A. Direct and Indirect Impacts

Level of Service

The construction scenario, access routes, staging areas and other design features for Alternative 1 would be the same as for the proposed project / proposed action although the area of impact would be 20 acres larger and require an additional 3,469 straw bales. As with the proposed project / proposed action, construction traffic is estimated to generate 172 daily vehicle trips during the first year to complete installation of plants and straw bales. Due to the increase in the amount of straw bales, each of the two supplemental watering events for Alternative 1 would require up to 48 water truck round-trips per supplemental watering event, totaling a maximum of 94 water truck round-trips per year. Therefore, the transportation and traffic for Alternative 1 would be comparable to the proposed project / proposed action described in Section 4.11.3.1.

Hazardous Roadway Design

As with the proposed project / proposed action, Alternative 1 would not require any changes to the existing design of the roadway network or increase incompatible uses and construction and operation of this alternative includes the requirement to obtain an encroachment permit from Caltrans and preparation of a Traffic Control Plan to ensure the safe transport of equipment and materials in a manner that safeguards vehicular traffic on US 395, SR 136, and SR 190.

Emergency Vehicle Access/Egress

As with the proposed project / proposed action, Alternative 1 would not result in impacts to transportation and traffic in relation to inadequate emergency access. SR 190 and SR 136 operate at LOS A, immediately adjacent to the proposed project / proposed action area in the Future with proposed project / proposed action condition. Thus, the construction and operations phases of Alternative 1 would not adversely affect the capacity of the local highways to accommodate vehicular traffic during an emergency response or evacuation. Therefore, there would be no expected impacts to transportation and traffic related to inadequate emergency access on the surrounding highway system.

Parking Capacity

As with the proposed project / proposed action, Alternative 1 would not result in impacts to transportation and traffic in relation to inadequate parking capacity. Limited parking would be provided on the site to accommodate routine maintenance and monitoring vehicles. During construction, employees would park in the main staging area (Staging Area 2), east of the Old State Highway. Therefore, Alternative 1 would not impact transportation and traffic related to inadequate parking capacity.

Alternative Transportation

As with Alternative 1, the proposed project / proposed action would not result in impacts to transportation and traffic in relation to adopted policies, plans, or programs supporting alternative transportation. There are no existing or planned facilities for public transit, bicycles, or pedestrians in the vicinity of the proposed project / proposed action. Therefore, Alternative 1 would not result in a significant adverse impact related to adopted policies, plans, or programs supporting alternative transportation.

Air Traffic Patterns

Due to the distance between the Alternative 1 site and the nearest public or private airport, as described earlier, and the types of uses associated with Alternative 1, no impacts to traffic and transportation related to a change in air traffic patterns that result in substantial safety risks are expected to occur.

B. CEQA Significance Determinations

Would Alternative 1:

(1) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

(2) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

Construction

As shown in Table 4.11.3.1-2, Alternative 1 would not substantially increase traffic volumes under Year 2012 Plus Proposed Project / Proposed Action Conditions. Intersection LOS calculations are included in Appendix H. All study area highway segment would continue to operate at LOS A. Likewise construction traffic on roadway and highway segments would not exceed V/C ratios. Therefore, construction traffic impacts under Year 2012 Plus Proposed Action Conditions are considered less than significant under CEQA.

Operations and Maintenance

The volume of traffic related to operations and maintenance activities would be lower than the traffic during project construction. The SR 136 segment that crosses through the project study area would continue to operate at LOS A. Likewise construction traffic on roadway and freeway segments would not exceed V/C ratios. Therefore, construction traffic impacts under Year 2012 Plus Proposed Project / Proposed Action Conditions are considered less than significant under CEQA.

(3) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

Construction / Operations and Maintenance

Alternative 1 would not affect air traffic patterns or air traffic levels; therefore there are no impacts to transportation and traffic related to air traffic.

(4) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Construction / Operations and Maintenance

Construction does not involve any roadway design elements with the exception of use of the existing access route (haul road) turnouts and the Old State Highway to the proposed project site. During construction, access to the proposed project would be provided from SR 136. Trips are substantially reduced during the operations and maintenance phase of the proposed project. As with the construction phase, access would be provided from SR 136 using an existing access route (haul road) and the Old State Highway.

Potential impacts associated with encroaching on California Department of Transportation (Caltrans) right-of-ways would be addressed by obtaining a Caltrans encroachment permit to protect public safety. In addition, any work requiring traffic control on SR 136 would be conducted in accordance with a traffic control plan approved by Caltrans. Therefore, compliance with Caltrans requirements would reduce the potential for direct impacts associated with design features to below the level of significance.

(5) Result in inadequate emergency access?

Construction / Operations and Maintenance

Emergency access to the proposed project site during the construction and operations and maintenance phases of the proposed project would be provided from SR 136. No direct or indirect impacts are anticipated to occur with regard to emergency access during construction.

(6) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

Construction / Operations and Maintenance

There are no existing or proposed facilities for public transit, bicycles or pedestrians in the vicinity of the proposed project; therefore, there are no impacts to such facilities.

4.11.3.3 ALTERNATIVE 2, DUST CONTROL MEASURES APPLIED TO 197 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / ATVS

Alternative 2 has DCMs applied at different intensities in different areas of the Keeler Dunes, and the total acreage treated is 3 acres larger than the proposed project / proposed action (as described in Section 2.2.3) This alternative focuses on applying the highest intensity of dust control (95 percent control efficiency) across the Keeler Dunes and inter-dune sand sheet areas (170 acres), while applying less intensive controls on other inter-dune areas (27 acres at 90 percent dust control efficiency). The staging areas, access routes, construction scenario, and watering would remain the same as for the proposed project / proposed action; only the numbers of straw bales and plants and the area they are applied to would be increased by less than 1.5 percent due to the additional 3 acres to be treated. The construction scenario, access routes, staging areas and other design features would be largely the same as for the proposed project / proposed action although the area of impact would be 3 acres larger.

A. Direct and Indirect Impacts

Level of Service

The construction scenario, access routes, staging areas and other design features for Alternative 2 would be the same as for the proposed project / proposed action although the area of impact would be 3 acres larger and require an additional 6,720 straw bales. As with the proposed project / proposed action, construction traffic is estimated to generate 172 daily vehicle trips during the first year to complete installation of plants and straw bales. Furthermore, as with the proposed project / proposed action, Alternative 2 would require up to two watering events per year for the first 3 years following completion of the installation of plants and straw bales. Due to the increase in the amount of straw bales, each of the three supplemental watering events for Alternative 2 would require up to 48 water truck round-trips per supplemental irrigation event, totaling a maximum of 96 water truck round-trips per year. Therefore, the transportation and traffic for Alternative 2 would be comparable to the proposed project / proposed action described in Section 4.11.3.1.

Hazardous Roadway Design

As with the proposed project / proposed action, Alternative 2 would not require any changes to the existing design of the roadway network or increase incompatible uses and construction and operation of this alternative includes the requirement to obtain an encroachment permit from Caltrans and preparation of a Traffic Control Plan to ensure the safe transport of equipment and materials in a manner that safeguards vehicular traffic on US 395, SR 136, and SR 190.

Emergency Vehicle Access/Egress

As with the proposed project / proposed action, Alternative 2 would not result in impacts to transportation and traffic in relation to inadequate emergency access. SR 190 and SR 136 operate at LOS A, immediately adjacent to the Alternative 2 project area. Thus, the construction and operations phases of Alternative 2 would not adversely affect the capacity of the local highways to accommodate vehicular traffic during an emergency response or evacuation. Therefore, there would be no expected impacts to transportation and traffic related to inadequate emergency access on the surrounding highway system.

Parking Capacity

As with the proposed project / proposed action, Alternative 2 would not result in impacts to transportation and traffic in relation to inadequate parking capacity. Limited parking would be provided on the site to accommodate routine maintenance and monitoring vehicles. During construction, employees would park in the main staging area (Staging Area 2), east of the Old State Highway. Therefore, Alternative 2 would not impact transportation and traffic related to inadequate parking capacity.

Alternative Transportation

As with proposed project / proposed action, Alternative 2 would not result in impacts to transportation and traffic in relation to adopted policies, plans, or programs supporting alternative transportation. There are no existing or planned facilities for public transit, bicycles, or pedestrians in the vicinity of the proposed project / proposed action. Therefore, Alternative 2 would not result in a significant adverse impact related to adopted policies, plans, or programs supporting alternative transportation.

Air Traffic Patterns

Due to the distance between the Alternative 2 site and the nearest public or private airport, as described earlier, and the types of uses associated with Alternative 2, no impacts to traffic and transportation related to a change in air traffic patterns that result in substantial safety risks are expected to occur.

B. CEQA Significance Determinations

Would Alternative 2:

(1) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

(2) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

Construction

As shown in Table 4.11.3.1-2, Alternative 2 would not substantially increase traffic volumes under Year 2012 Plus Proposed Project / Proposed Action Conditions. Intersection LOS calculations are included in Appendix H. All study area highway segment would continue to operate at LOS A. Likewise construction traffic on highway segments would not exceed V/C ratios. Therefore, construction traffic impacts under Year 2012 Plus Proposed Project / Proposed Action Conditions are considered less than significant under CEQA.

Operations and Maintenance

Consistent with the analysis performed for the proposed action / proposed project, the volume of traffic related to operations and maintenance activities would be lower than the traffic during project construction. All study area highway segments would continue to operate at LOS A. Likewise construction traffic on highway segments would not exceed V/C ratios. Therefore, construction traffic impacts under Year 2012 Plus Proposed Project / Proposed Action Conditions are considered less than significant under CEQA.

(3) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

Construction / Operations and Maintenance

Alternative 2 would not affect air traffic patterns or air traffic levels; therefore there are no impacts to transportation and traffic related to air traffic.

(4) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Construction / Operations and Maintenance

Construction does not involve any roadway design elements with the exception of use of the existing access route (haul road) turnouts to the proposed project site. During construction, access to the proposed project would be provided from SR 136. Trips are substantially reduced during the operations and maintenance phase of the proposed project. As with the construction phase, access would be provided from SR 136 using an existing access route (haul road) and the Old State Highway. Minimal maintenance activities would occur along Old State Highway to clear dust build up.

Potential impacts associated encroaching on California Department of Transportation (Caltrans) right-of-ways would be addressed by obtaining a Caltrans encroachment permit to protect public safety. In addition, any work requiring traffic control on SR 136 would be conducted in accordance with a traffic control plan approved by Caltrans. Therefore, compliance with Caltrans requirements would reduce the potential for direct impacts associated with design features to below the level of significance.

(5) Result in inadequate emergency access?

Construction / Operations and Maintenance

Emergency access to the proposed project site during the construction and operations and maintenance phases of the proposed project would be provided from SR 136. No direct or indirect impacts are anticipated to occur with regard to emergency access during construction.

(6) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

Construction / Operations and Maintenance

There are no existing or proposed facilities for public transit, bicycles or pedestrians in the vicinity of the proposed project; therefore there are no impacts to such facilities.

4.11.3.4 ALTERNATIVE 3, DUST CONTROL MEASURES APPLIED TO 194 ACRES USING IRRIGATION WATER DELIVERED VIA WATER TRUCKS / TANKS / PVC IRRIGATION SYSTEM AND SELECTED MANUAL WATERING

Under Alternative 3, the DCMs would be the same as the proposed project / proposed action (as described in Section 2.2.4). Water obtained from the District's production well at the Fault Test site would be transported to the project via large water trucks to temporary storage tanks located at the three of the four designated staging areas. Since the staging areas are lower in elevation than the project area, each staging area would need to have a manifold and booster pump to pressurize the irrigation system. The use of water tanks mounted on ATVs, to distribute supplemental irrigation during the operations and maintenance phase of the project, would be replaced with a temporary aboveground irrigation system that would be installed within the 95 percent control level area to provide water to the project area. Plants within the sensitive 85 percent control area would be manually watered using the same method as described proposed project / proposed action. The ATV mounted tanks would be filled with water from the delivery system within the project instead of from trucks at the staging areas.

A. Direct and Indirect Impacts

Level of Service

Alternative 3 would be essentially the same as the proposed project / proposed action, with 194 acres of area permanently treated with native plants and straw bales. This alternative proposes the addition of a temporary above ground irrigation system and involves the least amount of travel in the dunes (Please refer to Figure 2.2.4-1, *Alternative 3, Manual Watering and Irrigation Schematic Along Old State Highway*). Water obtained from the District's production well at the Fault Test site would be transported to the project via large water trucks to large water tanks at the staging areas along Old State Highway where it would connect to a temporary above ground irrigation system would be designed such that irrigation laterals are placed every 150 feet across the project. All travel associated with irrigation would be along the designated access routes and lateral lines. In Alternative 3, the water trucks would only be parked at the staging areas during times of active watering. The water trucks would be parked off-site at night and on weekends. As with the proposed project / proposed action, Alternative 3 applies dust control measures to 194 acres and requires the same amount of water truck round-trip deliveries for up to two supplemental watering events each year. Therefore, the transportation and traffic for Alternative 3 would be comparable to the proposed project / proposed action described in Section 4.11.3.1.

Hazardous Roadway Design

As with the proposed project / proposed action, Alternative 3 would not require any changes to the existing design of the roadway network or increase incompatible uses and construction and operation of this alternative includes the requirement to obtain an encroachment permit from Caltrans and preparation of a Traffic Control Plan to ensure the safe transport of equipment and materials in a manner that safeguards vehicular traffic on US 395, SR 136, and SR 190.

Emergency Vehicle Access/Egress

As with the proposed project / proposed action, Alternative 3 would not result in impacts to transportation and traffic in relation to inadequate emergency access. SR 190 and SR 136 operate at LOS A, immediately adjacent to the proposed project / proposed action area in the Future with Proposed Project / Proposed Action condition. Thus, the construction and operations phases of Alternative 3 would not adversely affect the capacity of the local highways to accommodate vehicular traffic during an emergency response or evacuation. Therefore, there would be no expected impacts to transportation and traffic related to inadequate emergency access on the surrounding highway system.

Parking Capacity

As with the proposed project / proposed action, Alternative 3 would not result in impacts to transportation and traffic in relation to inadequate parking capacity. Limited parking would be provided on the site to accommodate routine maintenance and monitoring vehicles. During construction, employees would park in the main staging area (Staging Area 2), east of the Old State Highway. Therefore, Alternative 3 would not impact transportation and traffic related to inadequate parking capacity.

Alternative Transportation

As with the proposed project / proposed action, Alternative 3 would not result in impacts to transportation and traffic in relation to adopted policies, plans, or programs supporting alternative transportation. There are no existing or planned facilities for public transit, bicycles, or pedestrians in the vicinity of the proposed project / proposed action. Therefore, Alternative 3 would not result in a significant adverse impact related to adopted policies, plans, or programs supporting alternative transportation.

Air Traffic Patterns

Due to the distance between the Alternative 3 site and the nearest public or private airport, as described earlier, and the types of uses associated with Alternative 3, no impacts to traffic and transportation related to a change in air traffic patterns that result in substantial safety risks are expected to occur.

B. CEQA Significance Determinations

Would Alternative 3:

(1) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

(2) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

Construction

As shown in Table 4.11.3.1-2, Alternative 3 would not substantially increase traffic volumes under Year 2012 Plus Proposed Project / Proposed Action Conditions. Intersection LOS calculations are included in Appendix H. All study area highway segment would continue to operate at LOS A. Likewise construction traffic on roadway and freeway segments would not exceed V/C ratios. Therefore, construction traffic impacts under Year 2012 Plus Proposed Project / Proposed Action Conditions are considered less than significant under CEQA.

Operations and Maintenance

Consistent with the analysis performed for the proposed action / proposed project, the volume of traffic related to operations and maintenance activities would be lower than the traffic during project construction. All study area highway segment would continue to operate at LOS A. Likewise construction traffic on roadway and freeway segments would not exceed V/C ratios. Therefore, construction traffic impacts under Year 2012 Plus Proposed Project / Proposed Action Conditions are considered less than significant under CEQA.

(3) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

Construction / Operations and Maintenance

Alternative 3 would not affect air traffic patterns or air traffic levels; therefore there are no impacts to transportation and traffic related to air traffic.

(4) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Construction / Operations and Maintenance

Construction does not involve any roadway design elements with the exception of use of the existing access route (haul road) turnouts to the proposed project site via the gravel haul road and the Old State Highway. During construction, access to the proposed project would be provided from SR 136. Trips are substantially reduced during the operations and maintenance phase of the proposed project. As with the construction phase, access would be provided from SR 136 using an existing access route (haul road) and the Old State Highway.

Potential impacts associated with driveways encroaching on California Department of Transportation (Caltrans) right-of-ways would be addressed by obtaining a Caltrans encroachment permit to protect public safety. In addition, any work requiring traffic control on SR 136 would be conducted in accordance with a traffic control plan approved by Caltrans. Therefore, compliance with Caltrans requirements would reduce the potential for direct impacts associated with design features to below the level of significance.

(5) Result in inadequate emergency access?

Construction / Operations and Maintenance

Emergency access to the proposed project / proposed action site during the construction and operations and maintenance phases of the proposed project would be provided from SR 136 and the Old State Highway. No direct or indirect impacts are anticipated to occur with regard to emergency access during construction.

(6) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

Construction / Operations and Maintenance

There are no existing or proposed facilities for public transit, bicycles or pedestrians in the vicinity of the proposed project / proposed action; therefore there are no impacts to such facilities.

4.11.3.5 Alternative 4, Dust Control Measures Applied to 194 Acres Using Irrigation Water Delivered via Water Trucks / PVC Irrigation System and Selected Manual Watering

Under Alternative 4, the DCMs would be the same as the proposed project / proposed action (as described in Section 2.25). In Alternative 4, water obtained from the Fault Test Well would be transported to the project via water trucks and the water delivery system would be fed from three supply points along State Route 136. As with Alternative 3, plants within the 95 percent control area would be watered with hoses attached to the laterals of the temporary PVC irrigation system. In this alternative, water trucks would stage next to the highway and deliver water directly in to the temporary PVC irrigation system, rather than utilizing water tanks at the staging areas for temporary storage. As in Alternative 3, hand watering would be done in approximately 8 percent of the dust control area using hoses to deliver water from tanks mounted on ATVs, stage in a manner to avoid sensitive cultural resources. As with the temporary irrigation system, the ATV mounted tanks would be filled with water from the delivery system within the project instead of from tanks at the staging areas.

A. Direct and Indirect Impacts

Level of Service

Alternative 4 would be essentially the same as the proposed project / proposed action, with 194 acres of area permanently treated with native plants and straw bales. This alternative proposes the addition of a temporary aboveground irrigation system and involves the least amount of travel in the dunes (Please refer to Figure 2.2.5-1, *Alternative 4, Manual Watering and Irrigation Schematic Along State Route 136*). Water obtained from the District's production well at the Fault Test site would be transported to the site via large water trucks that would connect to the water delivery system from turnouts off of SR 136. The temporary above ground irrigation system would be designed such that irrigation laterals are placed every 150 feet across the project. All travel associated with irrigation would be along the designated access routes and lateral lines. In Alternative 4, the water trucks would only be parked at the designated turnouts during times of active watering. Three turnouts would be established along the west side of SR 136 for water truck parking. The water trucks would be parked off-site at night and on weekends. As with the proposed project / proposed action, Alternative 4 applies dust control measures to 194 acres and requires the same amount of water truck round-trip deliveries for up to two supplemental watering events each year. Therefore, the transportation and traffic for Alternative 4 would be comparable to the proposed project / proposed action described in Section 4.11.3.1.

Hazardous Roadway Design

As with the proposed project / proposed action, Alternative 4 would not require any changes to the existing design of the roadway network or increase incompatible uses and construction and operation of this alternative includes the requirement to obtain an encroachment permit from Caltrans and preparation of a Traffic Control Plan to ensure the safe transport of equipment and materials in a manner that safeguards vehicular traffic on US 395, SR 136, and SR 190.

Emergency Vehicle Access/Egress

As with the proposed project / proposed action, Alternative 4 would not result in impacts to transportation and traffic in relation to inadequate emergency access. SR 190 and SR 136 operate at LOS A, immediately adjacent to the proposed project / proposed action area in the Future with Proposed Project / Proposed Action condition. Thus, the construction and operations phases of Alternative 4 would not adversely affect the capacity of the local highways to accommodate vehicular traffic during an emergency response or evacuation. Therefore, there would be no expected impacts to transportation and traffic related to inadequate emergency access on the surrounding highway system.

Parking Capacity

As with the proposed project / proposed action, Alternative 4 would not result in impacts to transportation and traffic in relation to inadequate parking capacity. Limited parking would be provided on the site to accommodate routine maintenance and monitoring vehicles. During construction, employees would park in the main staging area (Staging Area 2), east of the Old State Highway. Therefore, Alternative 4 would not impact transportation and traffic related to inadequate parking capacity.

Alternative Transportation

As with the proposed project / proposed action, Alternative 4 would not result in impacts to transportation and traffic in relation to adopted policies, plans, or programs supporting alternative transportation. There are no existing or planned facilities for public transit, bicycles, or pedestrians in the vicinity of the proposed project / proposed action. Therefore, Alternative 4 would not result in a significant adverse impact related to adopted policies, plans, or programs supporting alternative transportation.

Air Traffic Patterns

Due to the distance between the Alternative 4 site and the nearest public or private airport, as described earlier, and the types of uses associated with Alternative 4, no impacts to traffic and transportation related to a change in air traffic patterns that result in substantial safety risks are expected to occur.

B. CEQA Significance Determinations

Would Alternative 4:

(1) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

(2) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

Construction

As shown in Table 4.11.3.1-2, Alternative 4 would not substantially increase traffic volumes under Year 2012 Plus Proposed Project / Proposed Action Conditions. Intersection LOS calculations are included in Appendix H. All study area highway segment would continue to operate at LOS A. Likewise construction traffic on roadway and freeway segments would not exceed V/C ratios. Therefore, construction traffic impacts under Year 2012 Plus Proposed Project / Proposed Action Conditions are considered less than significant under CEQA.

Operations and Maintenance

Consistent with the analysis performed for the proposed project, the volume of traffic related to operations and maintenance activities would be lower than the traffic during project construction. All study area highway segment would continue to operate at LOS A. Likewise construction traffic on roadway and freeway segments would not exceed V/C ratios. Therefore, construction traffic impacts under Year 2012 Plus Proposed Project / Proposed Action Conditions are considered less than significant under CEQA.

(3) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

Construction / Operations and Maintenance

Alternative 4 would not affect air traffic patterns or air traffic levels; therefore there are no impacts to transportation and traffic related to air traffic.

(4) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Construction / Operations and Maintenance

Construction does not involve any roadway design elements with the exception of use of the existing access route (haul road) and the Old State Highway to the proposed project site. During construction, access to the proposed project / proposed action would be provided from SR 136 the gravel haul road and the Old State highway. Trips are substantially reduced during the operations and maintenance phase of the proposed project. As with the construction phase, access would be provided from SR 136 using an existing access route (haul road) and the Old State Highway. Minimal maintenance activities would occur along Old State Highway to clear dust build up.

Potential impacts associated with driveways encroaching on California Department of Transportation (Caltrans) right-of-ways would be addressed by obtaining a Caltrans encroachment permit to protect public safety. In addition, any work requiring traffic control on SR 136 would be conducted in accordance with a traffic control plan approved by Caltrans. Therefore, compliance with Caltrans requirements would reduce the potential for direct impacts associated with design features to below the level of significance.

(5) Result in inadequate emergency access?

Construction / Operations and Maintenance

Emergency access to the proposed project / proposed action site during the construction and operations and maintenance phases of the proposed project / proposed action would be provided from SR 136. No direct or indirect impacts are anticipated to occur with regard to emergency access during construction.

(6) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

Construction / Operations and Maintenance

There are no existing or proposed facilities for public transit, bicycles or pedestrians in the vicinity of the proposed project / proposed action; therefore there are no impacts to such facilities.

4.11.3.6 Alternative 5, Dust Control Measures Applied to 194 Acres Using Irrigation Water Delivered via KCSD Water Well / Pipeline to Irrigation System and Selected Manual Watering

Under Alternative 5, the DCMs would be the same as the proposed project / proposed action. In Alternative 5, water obtained from the KCSD well would be transported to the project via a temporary pipeline that connects into the KCSD water system near the KCSD well site. Water would be supplied directly to the temporary irrigation system from the KCSD, in lieu of the District's Fault Test well. As with Alternatives 3 and 4, Alternative 5 would include a temporary aboveground irrigation system installed within the 95 percent control level area to provide water to the project area. Plants within the sensitive 85 percent control area would be watered by hand using the same method as described above. The ATV mounted tanks would be filled with water from the delivery system within the project.

A. Direct and Indirect Impacts

Level of Service

Alternative 5 would be essentially the same as the proposed project / proposed action, with 194 acres of area permanently treated with native plants and straw bales. This alternative proposes the addition of a temporary aboveground irrigation system and involves the least amount of travel in the dunes (Please refer to Figure 2.2.6-1, *Alternative 5, Manual Watering and Irrigation Schematic with KCSD*

Well). Water obtained from the KCSD well would be transported to the project via a temporary pipeline that connects into the KCSD water system near the KCSD well site. Since Alternative 5 involves a direct water line from the KCSD system, no water trucks are required. Therefore, the transportation and traffic for Alternative 5 would be less than the proposed project / proposed action described in Section 4.11.3.1.

Hazardous Roadway Design

As with the proposed project / proposed action, Alternative 5 would not require any changes to the existing design of the roadway network or increase incompatible uses and construction and operation of this alternative includes the requirement to obtain an encroachment permit from Caltrans and preparation of a Traffic Control Plan to ensure the safe transport of equipment and materials in a manner that safeguards vehicular traffic on US 395, SR 136, and SR 190.

Emergency Vehicle Access/Egress

As with the proposed project / proposed action, Alternative 5 would not result in impacts to transportation and traffic in relation to inadequate emergency access. SR 190 and SR 136 operate at LOS A, immediately adjacent to the proposed project / proposed action area in the Future with Proposed Project / Proposed Action condition. Thus, the construction and operations phases of Alternative 5 would not adversely affect the capacity of the local highways to accommodate vehicular traffic during an emergency response or evacuation. Therefore, there would be no expected impacts to transportation and traffic related to inadequate emergency access on the surrounding highway system.

Parking Capacity

As with the proposed project / proposed action, Alternative 5 would not result in impacts to transportation and traffic in relation to inadequate parking capacity. Limited parking would be provided on the site to accommodate routine maintenance and monitoring vehicles. During construction, employees would park in the main staging area (Staging Area 2), east of the Old State Highway. Therefore, Alternative 5 would not impact transportation and traffic related to inadequate parking capacity.

Alternative Transportation

As with the proposed project / proposed action, Alternative 5 would not result in impacts to transportation and traffic in relation to adopted policies, plans, or programs supporting alternative transportation. There are no existing or planned facilities for public transit, bicycles, or pedestrians in the vicinity of the proposed project / proposed action. Therefore, Alternative 5 would not result in a significant adverse impact related to adopted policies, plans, or programs supporting alternative transportation.

Air Traffic Patterns

Due to the distance between the Alternative 5 site and the nearest public or private airport, as described earlier, and the types of uses associated with Alternative 5, no impacts to traffic and transportation related to a change in air traffic patterns that result in substantial safety risks are expected to occur.

B. CEQA Significance Determinations

Would Alternative 5:

(1) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

(2) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

Construction

As shown in Table 4.11.3.1-2, Alternative 5 would not substantially increase traffic volumes under Year 2012 Plus Proposed Project / Proposed Action Conditions. Intersection LOS calculations are included in Appendix H. All study area highway segment would continue to operate at LOS A. Likewise construction traffic on roadway and freeway segments would not exceed V/C ratios. Therefore, construction traffic impacts under Year 2012 Plus Proposed Project / Proposed Action Conditions are considered less than significant under CEQA.

Operations and Maintenance

Delivery of water for supplemental irrigation via pipeline from the KCSD well would eliminate the need for up to 92 truck trips per year for each of the 3 years following construction. Consistent with the analysis performed for the proposed project, the volume of traffic related to operations and maintenance activities would be lower than the traffic during project construction. All study area highway segments would continue to operate at LOS A. Likewise construction traffic on highway segments would not exceed V/C ratios. Therefore, construction traffic impacts under Year 2012 Plus Proposed project / proposed action Conditions are considered less than significant under CEQA.

(3) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

Construction / Operations and Maintenance

Alternative 5 would not affect air traffic patterns or air traffic levels; therefore there are no impacts to transportation and traffic related to air traffic.

(4) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Construction / Operations and Maintenance

Construction does not involve any roadway design elements with the exception of use of the existing access route (haul road) turnouts to the proposed project site. During construction, access to the proposed project would be provided from SR 136. Trips are substantially reduced during the operations and maintenance phase of the proposed project. As with the construction phase, access would be provided from SR 136 using an existing access route (haul road).

Potential impacts associated with encroaching on California Department of Transportation (Caltrans) right-of-ways would be addressed by obtaining a Caltrans encroachment permit to protect public safety. In addition, any work requiring traffic control on SR 136 would be conducted in accordance with a traffic control plan approved by Caltrans. Therefore, compliance with Caltrans requirements would reduce the potential for direct impacts associated with design features to below the level of significance.

(5) Result in inadequate emergency access?

Construction / Operations and Maintenance

Emergency access to the proposed project site during the construction and operations and maintenance phases of the proposed project / proposed action would be provided from SR 136. No direct or indirect impacts are anticipated to occur with regard to emergency access during construction.

(6) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

Construction / Operations and Maintenance

There are no existing or proposed facilities for public transit, bicycles or pedestrians in the vicinity of the proposed project / proposed action; therefore there are no impacts to such facilities.

4.11.3.7 Alternative 6, No Project / No Action Alternative

A. Direct and Indirect Impacts

Alternative 6, No Project / No Action, assumes that the dust control measures would not be implemented on the proposed project / proposed action site and windblown dust and associated PM_{10} emissions would continue to pose a health hazard to the communities of Keeler and Swansea. Under Alternative 6 it is likely that during high wind events, the NAAQS and California state standards for PM_{10} would continue to be exceeded in violation of the 2008 SIP. The sand dunes on the proposed project / proposed action site would continue to migrate to the south-southeast toward the community of Keeler and natural resources within the dunes would continue to be affected by the shifting sands resulting from high wind events

Construction / Operations and Maintenance

The proposed project / proposed action would not be constructed or operated if Alternative 6, No Project / No Action Alternative, was selected. No change in existing circulation patterns would occur. No traffic would be generated in association with construction, nor would any hazards from a design feature be created. Existing hazards related to reduced visibility for motorists on SR 136, during dust events originating from the Keeler Dunes, would remain unabated. Emergency access and parking capacity would also be non-issues. Thus, no direct or indirect impacts to transportation/circulation would occur under Alternative 6, No Project / No Action Alternative.

B. CEQA Significance Determinations

Construction / Operations and Maintenance

The proposed project would not be constructed or operated if Alternative 6, No Project / No Action Alternative, was selected. No change in existing circulation patterns would occur, no traffic would be generated in association with construction, nor would any hazards from a design feature be created. Emergency access and parking capacity would also be non-issues. Thus, no impacts to transportation/circulation would occur under CEQA for Alternative 6, No Project / No Action Alternative.

4.11.4 MITIGATION MEASURES

As shown in Table 4.11.3.1-2, the increases in traffic during peak construction of the proposed project / proposed action would not exceed LOS standards in Year 2012. Additionally, the proposed project / proposed action would require an encroachment permit from Caltrans to ensure compliance with traffic regulations. Therefore, construction traffic impacts to study area intersections would be considered less than significant under CEQA for Year 2012 Plus Proposed Project / Proposed Action Conditions for the proposed project / proposed action.

No significant direct impacts to intersections, roadway segments, freeway segments, hazards from a design feature, emergency access, or parking capacity were identified for the proposed project / proposed action; Alternatives 1 through 5; and Alternative 6, No Project / No Action Alternative. As a result, no mitigation measures are required.

4.11.5 RESIDUAL IMPACTS AFTER MITIGATION

No mitigation measures were required for the proposed project / proposed action or Alternatives 1, 2, 3, 4, 5, and 6. Therefore, there are no residual impacts after mitigation.

CHAPTER 5.0
CUMULATIVE IMPACTS

5.0 CUMULATIVE IMPACTS

Every effort has been made in this cumulative analysis to present a thorough discussion and/or analysis of direct and indirect cumulative impacts based on available and accurate information. The cumulative impacts/effects of the majority of the eleven resource areas examined in the EIR/EA are discussed at a qualitative level. Whenever possible, cumulative impacts are quantified using existing environmental documents or technical studies.

During the environmental review processes for both CEQA and NEPA, certain resource areas were determined to have no impact (or no adverse effect) and therefore no incremental effect that would be cumulatively considerable. Nevertheless the EIR/EA must still briefly describe the basis for concluding that the incremental effect is not cumulatively considerable or why the proposed project / proposed action would not result in an adverse cumulative impact when combined with other cumulative projects. For the purposes of CEQA, "cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of reasonably foreseeable projects. Likewise, under NEPA the "cumulative impact" refers to the impact on the environment resulting from the incremental impact of the proposed project / proposed action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions (40 CFR 1508.7). Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

5.01 CEQA PROCESS

Under CEQA, a project may result in a significant adverse cumulative impact where its effects are cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (California Code of Regulations, Title 14, Section 15130). Cumulative impacts could result from the construction, operation and maintenance, and decommissioning phases of the proposed project.

5.02 NEPA PROCESS

The purpose of the cumulative impact analysis under NEPA is to ensure that Federal decision-makers consider the full range of consequences of actions (the proposed action and alternatives, including the No Action Alternative). Assessing cumulative impacts begins early in the NEPA process, during internal and external scoping. In cases where, the proposed action and alternatives would have no direct or indirect effects on a resource, the cumulative impacts for the resource are not required to be analyzed.

When necessary to analyze, cumulative impacts are assessed based on geographic scope/context (spatial) and timeframe (temporal) boundaries.

5.02.1 GEOGRAPHIC SCOPE

The geographic scope is generally based on the natural boundaries of the resource affected, rather than jurisdictional boundaries. The geographic scope often differs for each resource area. For example, if a proposal affects water quality and air quality, the appropriate cumulative effects analysis areas may be the watershed and the airshed. In some cases, defining the geographic scope may be subjective but should be rational and reasonable. The rationale for selecting the geographic scope is be provided for each resource area.

5.02.2 TIMEFRAME

The timeframe refers the duration over which an impact would occur: short-term or long-term. Timeframes, like geographic scope, can vary by resource and be somewhat subjective. For example, the timeframe for construction air quality impacts would be much shorter than the timeframe for reestablishing vegetation impacted during construction. The rationale for selecting the timeframe is provided for each resource area.

5.03 EXISTING CUMULATIVE CONDITIONS

The cumulative impacts analysis considers past, present, and reasonably foreseeable future actions that would affect each resource area impacted within the geographic scope and the timeframe of the analysis. The cumulative impacts analysis considers other BLM actions, other Federal actions, and non-Federal (including private) actions (40 CFR 1508.7).

PAST, PRESENT, AND REASONABLY FORESEEABLE PROJECTS

The analysis of cumulative impacts takes into account the effects in common with other past, present, and reasonably foreseeable future actions. The analysis identifies past actions that are closely related either in time (temporal) or space (geographical proximity) to the proposed project / proposed action; present actions ongoing concurrently at the time this EIR/EA was being prepared; and reasonably foreseeable future actions, such as projects for which there are existing decisions, funding, formal proposals, or reasonably foreseeable future actions which are highly likely to occur based on known opportunities or trends.

In addition to coordinating with their internal planning personnel, the District and BLM contacted the State Lands Commission, Inyo County, and the LADWP to seek out information regarding past, present, and reasonably foreseeable probable future projects within the Owens Valley Planning Area. The District and the BLM identified 10 past, present, and reasonably foreseeable probable future projects that were considered in the evaluation of the potential for the proposed project to result in cumulative significant impacts (Table 5.03-1, *Cumulative Projects in the Vicinity of the Proposed Project / Proposed Action*; Figure 5.03-1, *Cumulative Projects in the Vicinity of the Proposed Project / Proposed Action*).

Varying degrees of information are available for projects in the cumulative list. For resource areas where quantitative information was available, a quantitative analysis is provided; however, if sufficient information was not available, a qualitative analysis is provided.

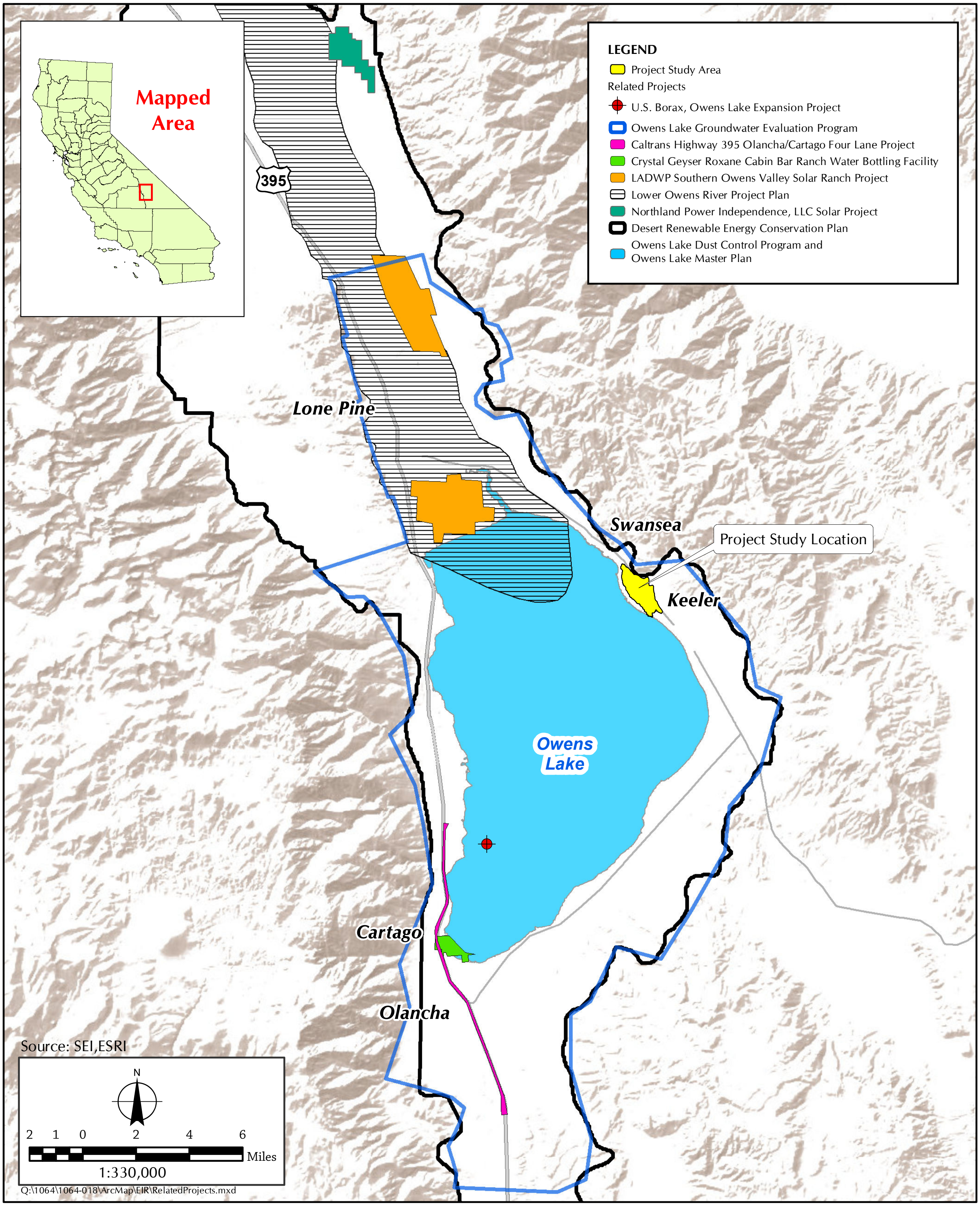

FIGURE 5.03-1

Cumulative Projects in the Vicinity of
the Proposed Project / Proposed Action

Table 5.03-1 provides a comprehensive listing of all reasonably foreseeable projects near the proposed project / proposed action. Reasonably foreseeable projects are those for which an application has been submitted to the appropriate agency, are currently undergoing environmental review, or will be pursuing environmental review in the near future (1 to 2 years or less). Activity must be occurring in order for the project to be reasonably foreseeable. Projects that have started the application or environmental review process but have been stalled over 6 months are not considered reasonably foreseeable.

Table 5.03-1 and Figure 5.03-1 identifies all projects that could contribute to a cumulative impact on the environment. Projects listed include projects on BLM-managed lands, California State managed lands and/or private lands, other actions/activities that have submitted an application and an acceptable plan of development for the use of public lands, and projects identified by state and local agencies. The table presents the name and owner, location, size, type, a brief description, status, potential impacts, assumptions, and status of each project, to the extent available. Most of the projects have been, are being, or would be required to undergo their own independent environmental review under CEQA, NEPA, and/or Council on Environmental Quality, as applicable. For the proposed project / proposed action, the cumulative scenario for each issue area includes all or a portion of the 10 projects listed in Table 5.03-1 and shown in Figure 5.03-1.

With the exception of climate change, which is a global issue, the California desert is identified as the largest area within which cumulative effects could be assessed for all disciplines. However, within the desert region, the specific area of cumulative effect varies by resource. For each resource, the geographic scope of analysis is based on the topographical surrounding of the project and the natural boundaries of the resource affected, rather than jurisdictional boundaries.

In addition, each project in a region would have its own implementation schedule, which may or may not coincide or overlap with the proposed project / proposed action's schedule. This is a consideration for short-term impacts from the proposed project. However, to be conservative, the cumulative analysis assumes that all projects in the cumulative scenario are built and operating during the operating lifetime of the proposed project / proposed action.

The direct and indirect effects of the proposed project / proposed action and each alternative, together with the effects of the other actions that have a cumulative effect, are analyzed for each resource or issue area. For the sake of being conservative, the cumulative analysis assumes that the projects identified in the cumulative scenario would be constructed because they are considered to be reasonably foreseeable (i.e. projects for which an application has been submitted to the appropriate agency, are currently undergoing environmental review, or will be pursuing environmental review in the near future (1 to 2 years or less).

TABLE 5.03-1
CUMULATIVE PROJECTS IN THE VICINITY OF THE PROPOSED PROJECT / PROPOSED ACTION

Project Name	Size/Location	Description of Project	Impacts	Assumptions	Status
Owens Lake Dust Control Program	The Owens Valley Planning Area (OVPA) includes portions of the Owens Lake bed. The lake bed extends about 17 miles north and south and 10 miles east and west and covers an area of approximately 110 square miles (70,000 acres).	Construction, operation, and maintenance of Dust Control Measures (DCMs).	Impacts include air quality, biological resources, cultural resources, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, traffic and transportation, and utilities and service systems.	Approximately 2.86 square miles of additional dust controls are required of which 11.4 acres of BLM lands will be subject to DCMs as indicated in 2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan.	As of January 2013, approximately 42 out of 45 square miles of committed dust controls have been completed.
Lower Owens River Project	77, 657 acres of land including 62 miles of river, 1,500 acres of wetland and numerous ponds and small rivers. The project is located in the Owens Valley north of Owens Lake.	A large-scale habitat restoration project. The project's main objective is to mitigate impacts related to groundwater pumping by LADWP from 1970 to 1990. The project includes (1) releasing water to the Lower Owens River to enhance native and game fisheries and riparian habitats along 62 miles of the river, (2) providing water to the Owens River delta to maintain and enhance various wetland and aquatic habitats, (3) enhancing a 1,500-acre off-river area with seasonal flooding and land management to benefit wetlands and waterfowl, and (4) maintaining several off-river lakes and ponds. The project also includes the construction of a pump station to capture and recover some of the water released to the river as well as range improvements and modified grazing practices on leases in the project area.	Water quality degradation and fish kills during initial releases to the river Possible reduction in existing flows to the delta that could adversely affect existing wetland habitats Degradation of brine pool transition and associated shorebird habitat due to reduced flow to the delta Conversion of 2,873 acres of native upland habitats to wetlands: potential increase in mosquito populations along the river, potential increase in saltcedar (a nonnative weed) Potential to impact cultural sites		2012 Annual Report released documenting on-going monitoring consisting of: -Seasonal Habitat Flow Flooded Extent and Water Quality (May 2012) -Rapid Assessment Survey (August 2012) Hydrologic Monitoring (throughout 2012) -Land Management (throughout 2012) -Streamside Monitoring for Woody Species Regeneration and other Riparian (September 2012) -Weed Monitoring and Treatment (growing Season 2012)
Owens Lake Master Project (formerly called the Owens Lake Master Plan)	110 square miles of Owens Lake bed, excluding the Lower Owens River Delta (covered by the Lower Owens River Project).	The intent of the draft Owens Lake Master Project (OLMP) is to provide a framework to manage the diverse resources of the lake, while continuing to control dust emissions. Owens Lake resources identified by OLMP include habitat, public access and recreation, open space and scenic amenities, a rich cultural history, grazing and mining resources, and opportunities for renewable energy and economic development	Impacts include visual aesthetics, possible impacts resultant from groundwater use in dust control measures, grazing impacts, impacts to biological and cultural resources due to increased public access and habitat alteration.	Unspecified amount of land managed by BLM within project area.	Review draft Master Plan submitted to planning committee December 2011, comments received 2012. Draft Master Project document available 2013.
Owens Lake Groundwater Evaluation Program	Owens Lake area and underlying groundwater basin.	The LADWP is evaluating Owens Lake groundwater as a water source for a portion of the dust control activities. Conceptual and numerical hydrogeological models and simulated pumping plans have been completed to date.	Possible future impacts due to water production and associated groundwater table reduction impacting spring flows, domestic water supply, ground subsidence and increase in dust source areas.		The program recommends further study into groundwater resources which includes the drilling of several new wells and a 3-year monitoring plan followed by a phased implementation of a groundwater production plan.

TABLE 5.03-1
CUMULATIVE PROJECTS IN THE VICINITY OF THE PROPOSED PROJECT / PROPOSED ACTION, *CONTINUED*

Project Name	Size/Location	Description of Project	Impacts	Assumptions	Status
Crystal Geyser Roxane Cabin Bar Ranch Water Bottling Facility	34.41 acre adjacent to US 395, immediately south of the unincorporated town of Cartago, Inyo County.	The proposed project involves construction of a spring water bottling facility and ancillary facilities utilizing groundwater from four existing groundwater wells on-site.	Impacts, via removal, to approximately 0.04 acre of non-wetland Army Corp of Engineer/Regional Water Quality Control Board jurisdictional "waters of the U.S." and 0.16 acre of California Fish and Wildlife jurisdictional streambed. These are considered significant impacts. Possible impacts to at least 16 special status flora species. Possible impacts to at least 10 special status fauna species. Possible impacts to jurisdictional resources as a result of seasonal lowering of groundwater table due to pumping. Effects upon nearby playa wetlands and/or riparian vegetation cannot be accurately determined. Possible impacts to unknown or buried archaeological and/or paleontological resources.		Draft EIR Submitted for public review in August 2012.
U.S. Borax, Owens Lake Expansion Project / Conditional Use Permit #02-13 / Reclamation Plan #02-1		This project proposes to install a trona ore processing facility at Owens Lake. The facility would consist of portable and mobile washing equipment located on the lake bed and a calcining and drying unit on the western shore.	Unknown.		
LADWP Southern Owens Valley Solar Ranch Project	1,600 acres of a 3,100-acre site in southern Owens Valley north of Owens Lake.	Development of net generation capacity of 200 megawatts of solar photovoltaic electrical energy and auxiliary equipment.	The planned EIR will analyze visual aesthetics, agricultural and forestry resources, air quality, biological resources, cultural resources, geology and soils, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, land use, mineral resources, noise, population and housing, public services, recreation, traffic and circulation, and utilities and service systems for potential impacts.		A Notice of Preparation of an Environmental Impact Report (EIR) was published in September 30, 2010

TABLE 5.03-1
CUMULATIVE PROJECTS IN THE VICINITY OF THE PROPOSED PROJECT / PROPOSED ACTION, *CONTINUED*

Project Name	Size/Location	Description of Project	Impacts	Assumptions	Status
Desert Renewable Energy Conservation Plan	Area includes the Mojave and Colorado desert regions and adjacent lands of seven California counties - Imperial, Inyo, Kern, Los Angeles, Riverside, San Bernardino, and San Diego. The Plan Area covers about 22,587,000 acres	The Desert Renewable Energy Conservation Plan (DRECP) is intended to conserve threatened and endangered species and natural communities in the Mojave and Colorado Desert regions of Southern California while facilitating timely permitting of renewable energy projects to help meet the State's goal of providing at least 33 percent of electricity generation through renewable energy by 2020 and the Federal government's goal of increasing renewable energy generation on public land. The plan is intended to serve as a Natural Community Conservation Plan (NCCP) under California Fish and Game code and a multiple-species Habitat Conservation Plan under the Federal Endangered Species Act and will provide a basis for the issuance of Take authorizations allowing the lawful Take of Covered Species incidental to Covered Activities.	Unknown potential impacts.		A Draft DRECP will be released for formal public review in 2013 according to the Renewable Energy Action Team
Caltrans Highway 395 Olancha / Cartago Four-Lane Project	12.6 miles of Highway 395	The Caltrans Highway 395 Olancha/Cartago Four-Lane Project will widen to four lanes approximately 12.6 miles of the two-lane highway.	Potential impacts to threatened or endangered species Potential impacts to wetlands. Potential impacts to cultural resources. Potential impacts to paleontological resources. Potential visual/aesthetic impacts.		On June 29, 2011, District 9 Director Tom Hallenbeck announced that the preferred alternative for the Olancha/Cartago 4 Lane project is a combination of Alternative 3 and Alternative 4.
Northland Power Independence, LLC Solar Project	The site is approximately 1,280-acres and is located about five miles east of Independence, CA	The proposed project would generate about 200 megawatts of power and would have a useful life of 35 years	The Initial Study, including an environmental checklist, indicates that the proposed project could potentially have a significant adverse impact on the environment or require mitigation to avoid potentially significant adverse effects on the environment for certain aspects of the following environmental topic areas: aesthetics, air quality, biological resources, cultural resources, hazards and hazardous materials, hydrology and water quality, land use and planning, population and housing, public services, recreation, transportation/traffic, and utilities and service systems.	Two alternatives for an intertie to City of Los Angeles Department of Water and Power (DWP) transmission facilities to the west of the site through DWP lands, Bureau of Land Management (BLM) lands, and/or along the County's Mazourka Canyon Road right-of-way are proposed.	A Notice of Preparation of an EIR was issued on March 28, 2013

5.1 AESTHETICS / VISUAL RESOURCES

Visual resources were analyzed using the BLM's VRM system (described in Section 3.1). BLM requires that this system be used for analyzing visual resources on lands administered by the BLM. For consistency, the VRM system was also used to analyze visual resources for the components of the project on non-BLM lands.

The proposed project / proposed action falls in VRI III based on its Scenic Quality Classification of C, Low Visual Sensitivity Level, and viewing distance of Foreground, with some barely visible and intermixed with existing vegetation. The objective of Class III VRM is to partially retain the visual character of the landscape. The level of change to the visual character of the landscape should be moderate. Changes, which are modeled after the surrounding native vegetation, should not dominate the view of the casual observer. The project site has a low visual sensitivity level based on the number of viewers traveling along SR 136 and the relatively low profile of the proposed improvements. The project site is viewed from the KOPs at a viewing distance of foreground (less than 3 to 5 miles). This zone defines the area in which the landscape details transition from readily perceived to outlines and patterns.

A cumulative impact to visual resources would occur in a situation where the proposed project / proposed action or an alternative occupies the same field of view as other built facilities or impacted landscapes. If the change caused by the addition of the proposed project / proposed action or an alternative to the visible landscape is perceived as adverse, then a cumulative impact to visual resources would occur. Likewise if a viewer perceives that the general visual quality or landscape character of a localized or regional area is diminished by the proliferation of structures, or sources of light and glare, a cumulative impact to visual resources could also occur.

There is currently no anticipated development to occur along SR 136. A list of the existing and reasonably foreseeable cumulative projects is provided in Section 5.0.

5.1.1 GEOGRAPHIC SCOPE

The proposed project / proposed action is located immediately northwest of the community of Keeler in Inyo County, California. The proposed project / proposed action consists of DCMs applied to 194 acres of land within a 1.36-square-mile study area. The proposed project / proposed action study area is bounded approximately by the Inyo Mountains on the east-northeast and the dry Owens Lake bed shoreline on the west-southwest, and extends approximately 2.5 miles to the northwest from the community of Keeler. SR 136 bisects the study area. The proposed project / proposed action is located on lands administered by the BLM Bishop Office and the LADWP. Other stakeholders include Inyo County, the local Lone Pine Paiute-Shoshone Tribe, Caltrans District 9, Keeler Community Services District, and Keeler residents.

The visual character of the proposed project / proposed action site includes the Keeler Dunes geologic feature, with the dry Owens Lake Bed to the west, the nearby Inyo Mountains range to the east, the more distant Coso Mountain range to the south, and the Sierra Nevada range to the far west. Although the proposed project / proposed action site is uninhabited, the community of Keeler (population: 66) is located adjacent to the southern border of the site.[1] Residents of Keeler are known to use the Keeler

[1] U.S. Census Bureau. 2010 Census. Washington, DC.

Dunes for low-impact recreational activities, such as hiking and dog walking.[2] The proposed project / proposed action site may also be visible to outside recreationalists, such as birders, hikers, and visitors to the historic mining/smelter sites of Swansea and Cerro Gordo, as part of the viewshed from nearby recreational areas, such as the Lower Owens River/Lake area. Inyo County and LADWP are currently evaluating the potential opportunities and constraints with regard to existing recreational activities in the adjacent Lower Owens River/Lake area.

The nearest highways to the proposed project / proposed action site are SR 136, which bisects the study area, and SR 190, located south of the proposed project / proposed action site. SR 136 is not an officially designated state scenic highway. A segment of SR 190, approximately 16.7 miles from the proposed project / proposed action site, is designated a state scenic highway behind the Inyo Mountains near the entrance to Death Valley National Park. However, the portion of SR 190 that is located near the proposed project / proposed action site is only an eligible, not a designated, state scenic highway. SR 190 is located approximately 5 miles south of the community of Keeler, and the proposed project / proposed action site is not likely to be visible to travelers on that highway.

The proposed project / proposed action site is visible from the vantage points of residents at Keeler, at the historic mining/smelter sites of Swansea and Cerro Gordo, recreationalists at the Lower Owens River/Lake area, and corridor users of SR 136.

5.1.2 TIMEFRAME

The timeframe refers to the duration over which an impact would occur: short-term or long-term. Short-term impacts to visual resources would occur during the construction phase of the proposed project / proposed action in association with the addition of construction equipment to the landscape. Installation of the proposed project / proposed action would require a maximum of 11 months to complete. Construction of the proposed project / proposed action would be divided into the following parts: (1) preparation of temporary access routes and staging areas, (2) bale placement and planting and watering, and (3) project oversight and monitoring and supplemental watering (up to two per year for 3 years) and additional planting as required. Based on the nature of the proposed project / proposed action as a vegetation project to control dust, no long-term impacts to visual resources are anticipated in association with the operations and maintenance, or monitoring phase of the proposed project / proposed action.

5.1.3 EXISTING CUMULATIVE CONDITIONS

5.1.3.1 PAST, PRESENT, AND REASONABLY FORESEEABLE PROJECTS

The existing cumulative conditions include past, present, and reasonably foreseeable future actions that could conflict with existing land use patterns or special designations. Past and present projects represent those that have been developed and are currently operational or projects that are currently under construction and will be operational in the near future (1 to 2 years or less). Reasonably foreseeable projects are those for which an application has been submitted to the appropriate agency, are currently undergoing environmental review, or will be pursuing environmental review in the near future (1 to 2 years or less). Activity must be occurring in order for the proposed project / proposed

[2] Sapphos Environmental, Inc. 12 July 2011. Memorandum for the Record No. 1. Subject: Summary of the June 29, 2011, Project Kickoff Meeting for the Keeler Dunes Environmental Impact Report / Environmental Impact Statement. Pasadena, CA.

action to be reasonably foreseeable. Projects that have started the application or environmental review process but have been stalled over 6 months are not considered reasonably foreseeable.

Section 5.0, *Cumulative Impacts*, describes in detail all past, present, and reasonably foreseeable projects in the vicinity of the proposed project / proposed action.

In addition to coordinating with their internal planning personnel, the District and BLM contacted the California State Lands Commission, Inyo County, and the LADWP to seek out information regarding past, present, and reasonably foreseeable probable future projects within the Owens Valley Planning Area. The District and the BLM identified nine past, present, and reasonably foreseeable probable future projects that were considered in the evaluation of the potential for the proposed project / proposed action to result in cumulative significant impacts (Figure 5.03-1, *Cumulative Projects in the Vicinity of the Proposed Project / Proposed Action*, and Table 5.1.3.1-1, *List of Cumulative Projects within the Vicinity of the Proposed Project / Proposed Action for the Analysis of Cumulative Impacts to Aesthetics / Visual Resources*):

TABLE 5.1.3.1-1
LIST OF CUMULATIVE PROJECTS WITHIN THE VICINITY OF THE PROPOSED PROJECT / PROPOSED ACTION FOR THE ANALYSIS OF CUMULATIVE IMPACTS TO AESTHETICS / VISUAL RESOURCES

Project Name	Distance from Proposed Project / Proposed Action Site	Included in Cumulative Analysis?	Level of Impact to Aesthetics/Visual Resources
Owens Lake Dust Control Program	Less than 1 mile from the proposed project / proposed action site	Yes	This project is not anticipated to cumulatively contribute to aesthetic and visual resource impacts based on its timing. In addition, all projects are anticipated to implement aesthetic and visual resource mitigation measures to reduce adverse impact.
Lower Owens River Project	Approximately 2 miles west of the proposed project / proposed action site	Yes	The Lower Owens River Project Plan is not anticipated to cumulatively contribute to aesthetic and visual resource impacts based on the nature and location of the project. In addition, all projects are anticipated to implement aesthetic and visual resource mitigation measures to reduce adverse impact.
Owens Lake Master Project	Less than 1 mile from the proposed project / proposed action site	No	The LADWP Owens Lake Master Project is not anticipated to cumulatively contribute to aesthetic and visual resource impacts based on its timing. In addition, all projects are anticipated to implement aesthetic and visual resource mitigation measures to reduce adverse impacts.
Owens Lake Groundwater Evaluation Program	Less than 1 mile from the proposed project / proposed action site	No	The Owen Lake Groundwater Evaluation Program is not anticipated to cumulatively contribute to aesthetic and visual resource impacts based on its location and nature of the project. In addition, all projects are anticipated to implement aesthetic and visual resource mitigation measures to reduce adverse impacts.

TABLE 5.1.3.1-1
LIST OF CUMULATIVE PROJECTS WITHIN THE VICINITY OF THE PROPOSED PROJECT / PROPOSED ACTION FOR THE ANALYSIS OF CUMULATIVE IMPACTS TO AESTHETICS / VISUAL RESOURCES, *CONTINUED*

Project Name	Distance from Proposed Project / Proposed Action Site	Included in Cumulative Analysis?	Level of Impact to Aesthetics/Visual Resources
Crystal Geyser Roxane Cabin Bar Ranch Water Bottling Facility	Approximately 16 miles southwest of the proposed project / proposed action site	No	The Crystal Geyser Roxane Cabin Bar Ranch Water Bottling Facility Project is not anticipated to cumulatively contribute to aesthetic and visual resource impacts based on its location and timing. In addition, all projects are anticipated to implement aesthetic and visual resource mitigation measures to reduce adverse impacts.
U.S. Borax, Owens Lake Expansion Project	Approximately 10 miles southwest of the proposed project / proposed action site	No	The U.S. Borax Owens Lake Expansion Project is not anticipated to cumulatively contribute to aesthetic and visual resource impacts based on its location and timing. In addition, all projects are anticipated to implement aesthetic and visual resource mitigation measures to reduce adverse impacts.
LADWP Southern Owens Valley Solar Ranch Project	Approximately 12 miles northwest of the proposed project / proposed action site	No	The project involves the development of a 200-megawatt solar facility on 1,600 acres in the lower Owens River Valley. The LADWP Southern Owens Valley Solar Ranch is not anticipated to cumulatively contribute to aesthetic and visual resource impacts based on its location and timing. In addition, all projects are anticipated to implement aesthetic and visual resource mitigation measures to reduce adverse impacts.
Desert Renewable Energy Conservation Plan	Plan Area covers about 22,587,000 acres, including proposed project / proposed action site	Yes	The Desert Renewable Energy Conservation Plan (DRECP) is intended to conserve threatened and endangered species and natural communities in the Mojave and Colorado Desert regions of Southern California. The DRECP is not anticipated to cumulatively contribute to aesthetic and visual resource impacts based on the nature of the project. In addition, all projects are anticipated to implement aesthetic and visual resource mitigation measures to reduce adverse impacts
Caltrans Highway 395 Olancha/ Cartago Four-Lane Project	Approximately 7 miles west of the proposed project / proposed action site	No	The Caltrans Highway 395 Olancha/Cartago Four-Lane Project is neither within the 2.5-mile radius nor is it expected to be under construction simultaneously with the proposed project / proposed action. The Caltrans Highway 395 Olancha/Cartago Four-Lane Project is not anticipated to cumulatively contribute to aesthetic and visual resource impacts based on its location and timing. In addition, all projects are anticipated to implement aesthetic and visual resource mitigation measures to reduce adverse impacts.

TABLE 5.1.3.1-1
LIST OF CUMULATIVE PROJECTS WITHIN THE VICINITY OF THE PROPOSED PROJECT / PROPOSED ACTION FOR THE ANALYSIS OF CUMULATIVE IMPACTS TO AESTHETICS / VISUAL RESOURCES, *CONTINUED*

Project Name	Distance from Proposed Project / Proposed Action Site	Included in Cumulative Analysis?	Level of Impact to Aesthetics/Visual Resources
Northland Power Independence, LLC Solar Project	Approximately 5 miles east of Independence, CA	No	The 1,280-acre project involves the development of a 200-megawatt solar facility in the lower Owens River Valley. Aesthetic and visual resource impacts are not known.

5.1.4 CUMULATIVE VISUAL RESOURCES IMPACTS

In consideration of related past, present, or reasonably foreseeable probable future projects as listed in Section 5.0, the incremental impact of the combined components of the proposed project / proposed action would not lead to a significant impact to aesthetics / visual resources.

5.1.4.1 SCENIC VISTAS

There are no scenic vistas within the vicinity of the proposed project / proposed action site. Therefore, the proposed project / proposed action when considered with the related past, present, or reasonably foreseeable, probable future projects would not result in significant impacts on scenic vistas, and the proposed project / proposed action would not contribute to cumulative impacts to scenic vistas.

5.1.4.2 SCENIC HIGHWAYS AND RESOURCES

There are no officially designated scenic highways within the vicinity of the proposed project / proposed action site. Therefore, the cumulative development would not result in significant impacts to scenic highways and the proposed project / proposed action would not contribute to cumulative impacts to scenic vistas and scenic resources.

5.1.4.3 VISUAL CHARACTER

The proposed project / proposed action would result in stabilization and revegetation of the sand dunes and sand sheet, which is currently in flux. Stabilization and revegetation of these sand deposits would be consistent with the visual character of the area because the bale pattern that will be installed will mimic a natural vegetation distribution in the area. Therefore, the proposed project / proposed action would not significantly contribute to cumulative impacts to the visual character of Owens Lake, Inyo County, or the Bishop Resource Management Area. Therefore, the proposed project / proposed action would not be expected to result in significant cumulative impacts to the visual character of Owens Lake, Inyo County, or the Bishop Resource Management Area.

5.1.4.4 Light and Glare

The proposed project / proposed action would not create new sources of light and glare. Given that the proposed project / proposed action would not generate new sources of light or glare, the proposed project / proposed action would not contribute to a significant cumulative impact related to nighttime views in the area or light intrusion. Therefore, the proposed project / proposed action would not contribute to the cumulative creation of a new sources of substantial light or glare that would adversely affect day or nighttime views in the area.

5.2 AIR QUALITY

5.2.1 GEOGRAPHIC SCOPE

Cumulative impacts to air quality could occur if implementation of the proposed project / proposed action would combine with air quality impacts of other local or regional projects. A list of the existing and reasonably foreseeable cumulative projects is provided in Table 5.03-1, *Cumulative Projects in the Vicinity of the Proposed Project / Proposed Action*. Related projects are mapped in Figure 5.03-1, *Cumulative Projects in the Vicinity of the Proposed Project / Proposed Action*). A geographic scope of 2.5 miles from the proposed project / proposed action was used for this analysis.

5.2.2 TIMEFRAME

The timeframe refers to the duration over which an impact would occur: short-term or long-term. Short-term impacts to air quality would occur during the construction phase of the proposed project / proposed action in association with the addition of construction equipment to the landscape. Installation of the proposed project / proposed action would require a maximum of 11 months to complete. Construction of the proposed project / proposed action would be divided into the following parts: (1) preparation of temporary access routes and staging areas, (2) bale placement and planting and watering, and (3) project oversight and monitoring and supplemental watering (up to two per year for 3 years) and additional planting as required. Based on the nature of the proposed project / proposed action as a vegetation project to control dust, no long-term impacts to air quality are anticipated in association with the construction, operation and maintenance, or monitoring phase of the proposed project / proposed action. Very small increases in traffic volumes associated with operations would occur and are not anticipated to adversely impact air quality during the operational life of the proposed project / proposed action (approximately 3 years).

5.2.3 EXISTING CUMULATIVE CONDITIONS

5.2.3.1 PAST, PRESENT AND REASONABLY FORESEEABLE PROJECTS

The District and BLM contacted the California State Lands Commission, Inyo County, and the LADWP to seek out information regarding past, present and reasonably foreseeable probable future projects within the Owens Valley Planning Area. The District and the BLM identified 10 past, present, and reasonably foreseeable probable future projects that were considered in the evaluation of the potential for the proposed project / proposed action to result in cumulative significant impacts (Table 5.2.3.1-1, *Past, Present, and Reasonably Foreseeable Projects in the Vicinity of the Proposed Project / Proposed Action*).

TABLE 5.2.3.1-1
PAST, PRESENT, AND REASONABLY FORESEEABLE PROJECTS IN THE VICINITY OF THE PROPOSED PROJECT / PROPOSED ACTION

Project Name	Distance from Project Site	Included in Cumulative Analysis	Level of Impact to Air Quality
Owens Lake Dust Control Program	Less than 1 mile from the proposed project / proposed action site	Yes. The Owens Lake Dust Control Program is within the 2.5-mile radius, but has already been implemented in support of compliance with the NAAQS for PM_{10}.	The Owens Lake Dust Control Program is not anticipated to cumulatively contribute to air quality impacts based on its location and timing. In addition, all projects are anticipated to implement air quality mitigation measures to reduce adverse impacts.
Lower Owens River Project	Approximately 2 miles west of the proposed project / proposed action site	Yes. The Lower Owens River Project Plan is within the 2.5-mile radius; however, the nature of the project does not generate air quality impacts.	The Lower Owens River Project Plan is not anticipated to cumulatively contribute to air quality impacts based on the nature and location of the project. In addition, all projects are anticipated to implement air quality mitigation measures to reduce adverse impacts
Owens Lake Master Project	Less than 1 mile from the proposed project / proposed action site	No. The LADWP Owens Lake Master Project is neither within the 2.5-mile radius nor expected to be under construction simultaneously with the proposed project / proposed action.	The LADWP Owens Lake Master Project is not anticipated to cumulatively contribute to air quality impacts based on its location and timing. In addition, all projects are anticipated to implement air quality mitigation measures to reduce adverse impacts
Owens Lake Groundwater Evaluation Program	Less than 1 mile from the proposed project / proposed action site	No. The Owen Lake Groundwater Evaluation Program is neither within the 2.5-mile radius nor expected to result in air quality impacts.	The Owen Lake Groundwater Evaluation Program is not anticipated to cumulatively contribute to air quality impacts based on its location and nature of the project.
Crystal Geyser Roxane Cabin Bar Ranch Water Bottling Facility	Approximately 16 miles southwest of the proposed project / proposed action site	No. The Crystal Geyser Roxane Cabin Bar Ranch Water Bottling Facility is neither within the 2.5-mile radius nor expected to be under construction simultaneously with the proposed project / proposed action.	The Crystal Geyser Roxane Cabin Bar Ranch Water Bottling Facility Project is not anticipated to cumulatively contribute to air quality impacts based on its location. In addition, all projects are anticipated to implement air quality mitigation measures to reduce adverse impacts.

Table 5.2.3.1-1
Past, Present, and Reasonably Foreseeable Projects in the Vicinity of the Proposed Project / Proposed Action, *Continued*

Project Name	Distance from Project Site	Included in Cumulative Analysis	Level of Impact to Air Quality
U.S. Borax, Owens Lake Expansion Project	Approximately 10 miles southwest of the proposed project / proposed action site	No. The U.S. Borax Owens Lake Expansion Project is not within the 2.5-mile radius of the proposed project / proposed action.	The U.S. Borax Owens Lake Expansion Project is not anticipated to cumulatively contribute to air quality impacts based on its location and timing. In addition, all projects are anticipated to implement air quality mitigation measures to reduce adverse impacts.
LADWP Southern Owens Valley Solar Ranch Project	Approximately 12 miles north of the proposed project / proposed action site	No. The LADWP Southern Owens Valley Solar Ranch is neither within the 2.5-mile radius nor expected to be under construction simultaneously with the proposed project / proposed action.	The LADWP Southern Owens Valley Solar Ranch is not anticipated to cumulatively contribute to air quality impacts based on its location and timing. In addition, all projects are anticipated to implement air quality mitigation measures to reduce adverse impacts.
Desert Renewable Energy Conservation Plan	Plan Area covers about 22,587,000 acres, including proposed project / proposed action site	Yes. The DRECP is within the 2.5-mile radius; however, the nature of the project does not generate air quality impacts.	The DRECP is not anticipated to cumulatively contribute to air quality impacts based on the nature of the project.
Caltrans Highway 395 Olancha/Cartago Four-Lane Project	Approximately 7 miles west of the proposed project / proposed action site	No. The Caltrans Highway 395 Olancha/Cartago Four-Lane Project is neither within the 2.5-mile radius nor expected to be under construction simultaneously with the proposed project / proposed action.	The Caltrans Highway 395 Olancha/Cartago Four-Lane Project is not anticipated to cumulatively contribute to air quality impacts based on its location and timing. In addition, all projects are anticipated to implement air quality mitigation measures to reduce adverse impacts.
Northland Power Independence, LLC Solar Project	Approximately 5 miles east of Independence, CA	No. The Northland Power Independence, LLC Solar Project is not within the 2.5-mile radius of the proposed project / proposed action area.	The 1,280-acre project involves the development of a 200-megawatt solar facility in the lower Owens River Valley based on its location and timing. In addition, this project would be required to implement air quality mitigation measures to reduce adverse impacts.

5.2.4 CUMULATIVE AIR QUALITY IMPACTS

5.2.4.1 DIRECT AND INDIRECT IMPACTS

A. Construction

As discussed in Section 4.4, the proposed project / proposed action or an alternative would not have any unmitigable construction air quality impacts with respect to ozone precursors NOx or PM_{10}. In addition, the cumulative projects identified in Table 5.2.3.1-1 are either: (1) not expected to be under peak construction concurrent with the proposed action; or the cumulative projects' estimated worst-case construction emissions would not overlap (i.e. combine) with the proposed project / proposed action or an alternative's worst-case estimated construction emissions. Stated another way, no significant cumulative project peak construction would coincide simultaneously with construction of the proposed project / proposed action. Or (2) such construction would be almost 2.5 miles away from the proposed project / proposed action site. Thus, if other projects are under construction simultaneously with the proposed project / proposed action, the cumulative impacts would be less than significant due to the proximity of past, present, and reasonably foreseeable projects to the proposed project / proposed action.

B. Operations and Maintenance

No cumulative air quality impacts are anticipated to occur during the 3 years of operations and maintenance or monitoring activities. The proposed project / proposed action by its nature as a vegetation project would not generate air emissions, and is intended to improve air quality through the reduction of PM_{10} emissions. A small amount of emissions would occur in association with operation and maintenance vehicle trips to and from the site. However, the number of trips is low and the associated air quality emissions would be low as well. As discussed in Section 4.2, emissions resulting from operations and maintenance of the proposed project / proposed action or an alternative for all criteria pollutants would be near zero. As is discussed above for construction, the temporal displacement between the proposed project / proposed action and other cumulative projects would ensure that emissions do not combine to create a cumulative effect. Therefore, no direct cumulative impact with regard to an air quality is anticipated during operations and maintenance of the proposed project / proposed action or an alternative.

5.2.4.2 CEQA SIGNIFICANCE DETERMINATIONS

For the purposes of the cumulative traffic analysis, only two CEQA significance criteria were considered appropriate for the analysis.

Would the proposed project:

(1) Violate air quality standards / cause air quality violations?

(2) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

A. Construction

As discussed in Section 4.2, the proposed project or an alternative would not generate ozone precursors and PM_{10}. Thus, no violation of an air quality standard or an air quality violation would occur due to project construction. Therefore, the proposed project would result in a less than cumulatively considerable contribution to violation of an air quality standard or air quality violation under CEQA. In addition, the cumulative projects identified in Table 5.2.3.1-1 are still in the early stages of environmental review and thus not expected to be under peak construction at the same time as the proposed project or an alternative. Furthermore, if other cumulative projects are under construction simultaneous with the proposed project or an alternative, no cumulative construction air quality impacts are anticipated based on distance between construction activities. Other cumulative projects would also be assumed to implement mitigation measures to reduce their individual construction air quality impacts.

B. Operations and Maintenance

Emissions resulting from operations and maintenance of the proposed project for all criteria pollutants are anticipated to be near zero. Therefore, the proposed project or alternative would not result in cumulatively considerable contributions to impacts to air quality standards during operations and maintenance under CEQA.

5.3 BIOLOGICAL RESOURCES

The cumulative impacts on biological resources is defined as the incremental physical impact of the proposed project / proposed action when added to other closely related past; present; and reasonably foreseeable, probable future projects. A list of the existing and reasonably foreseeable cumulative projects is provided in Table 5.03-1, *Cumulative Projects in the Vicinity of the Proposed Project / Proposed Action*. Related projects are mapped in Figure 5.03-1, *Cumulative Projects in the Vicinity of the Proposed Project / Proposed Action*.

5.3.1 GEOGRAPHIC SCOPE

The geographic scope, for considering cumulative impacts on general biological resources from the proposed project / proposed action, consists of the alluvial fans with shadscale scrub and sand dune environments above the bed of Owens Lake.

The geographic scope for considering cumulative impacts for migratory birds, including raptors, is the Owens Valley, which is part of the Pacific Migration Flyway for birds migrating between as far south as South America and as far north as the arctic circle, the riparian and wetland resources within the Owens Valley serve as an important stopover site for many species for rest and foraging. There is no suitable breeding habitat within the proposed project / proposed action study area.

The geographic scope for considering cumulative impacts for jurisdictional waters is the Owens Valley Hydrologic Unit of the South Lahontan Hydrologic Basin. The hydrologic unit code is 18090103 of the USDA National Resources Conservation Services. The brine pool at Owens Lake is the lowest point in the Owens Valley and receives drainage from the Owens River and stormwater runoff from the east side of the Sierra Nevada and the west side of the Inyo Mountains and the White Mountains.

5.3.2 TIMEFRAME

The timeframe refers to the duration over which an impact would occur: short-term or long-term. Short-term impacts to biological resources would occur during the construction period in association with ground disturbance. Long-term impacts to biological resources would occur as a result of any changes caused by development of the proposed project / proposed action over its life (in perpetuity).

Determining the temporal scope requires estimating the length of time the effects of the proposed project / proposed action will last, either individually or in combination with other anticipated effects. The temporal scope of impacts to biological resources during the development of cumulative projects would be through the end of project maintenance, because any direct or indirect effects would only occur during the life of the proposed project / proposed action.

5.3.3 EXISTING CUMULATIVE CONDITIONS

The existing cumulative conditions include a single plant community, shadscale scrub, which is not a state-designated sensitive habitat. There are no sensitive plant species within the project study area. The Owens dune weevil, a locally important species, is the only special status wildlife species in the survey area. There are no riparian or wetland habitats within the proposed project / proposed action study area. The proposed project / proposed action has been designed to avoid areas that are subject to the jurisdiction of the USACOE or CDFW.

5.3.3.1 PAST, PRESENT AND REASONABLY FORESEEABLE PROJECTS

A list of the existing and reasonably foreseeable cumulative projects is provided in Table 5.3.3.1-1, *List of Cumulative Projects within the Vicinity of the Proposed Project / Proposed Action for the Analysis of Cumulative Impacts to Biological Resources*. These projects include proposed or approved projects within the County's jurisdiction and within BLM's jurisdiction. These projects have either undergone independent environmental review pursuant to NEPA and/or CEQA or will do so prior to approval. Even if environmental review has not been completed for the projects described in Table 5.3.3.1-1, their potential effects were considered in the cumulative impacts analyses in this EA/EIR for the geographic area described above. These projects are in the various stages of permitting or construction.

TABLE 5.3.3.1-1
LIST OF CUMULATIVE PROJECTS WITHIN THE VICINITY OF THE PROPOSED PROJECT / PROPOSED ACTION FOR THE ANALYSIS OF CUMULATIVE IMPACTS TO BIOLOGICAL RESOURCES

Project Name	Distance from Proposed Project / Proposed Action Site	Included in Cumulative Analysis?	Level of Impact to Biological Resources
Owens Lake Dust Control Program	Less than 1 mile from the proposed project / proposed action site	Yes	This project involves the construction, operation, and maintenance of Dust Control Measures over an approximately 110-square mile area of the Owens Lake bed. Implementation of the proposed project has the potential to result in the impacts to western snowy plover, birds and bats, wetlands, and sensitive plant communities. It was determined that with the implementation of avoidance, minimization, and mitigation measures, the project would have a less than significant impact on biological resources.
Lower Owens River Project	Approximately 2 miles west of the proposed project / proposed action site	Yes	The project involved large-scale habitat restoration in the Owens Valley north of Owens Lake. The construction of access routes and a ditch has the potential to impact sensitive habitat. Implementation of mitigation measures is expected to reduce impacts to below the level of significance.
Owens Lake Master Project	Less than 1 mile from the proposed project / proposed action site	No	This project involves the development of framework for the management of resources and preservation of habitat value on Owens Lake. There are no biological resources in the Keeler Dunes that would be impacted by this project.
Owens Lake Groundwater Evaluation Program	Less than 1 mile from the proposed project / proposed action site	No	The LADWP is evaluating Owens Lake groundwater for supplying water to a portion of the dust control activities. Possible impacts to biological resources are not known but include potential reduction in spring flow at shoreline wetlands and related biological resource impacts to shoreline vegetation communities.
Crystal Geyser Roxane Cabin Bar Ranch Water Bottling	Approximately 16 miles southwest of the proposed	Yes	This project involves the construction of a spring water bottling facility and ancillary facilities. Anticipated biological impacts include those to yellow breasted chat, yellow warbler, Swainson's hawk, least Bell's

TABLE 5.3.3.1-1
LIST OF CUMULATIVE PROJECTS WITHIN THE VICINITY OF THE PROPOSED PROJECT / PROPOSED ACTION FOR THE ANALYSIS OF CUMULATIVE IMPACTS TO BIOLOGICAL RESOURCES, *CONTINUED*

Project Name	Distance from Proposed Project / Proposed Action Site	Included in Cumulative Analysis?	Level of Impact to Biological Resources
Facility	project / proposed action site		vireo, southwestern willow flycatcher, western yellow-billed cuckoo, pallid and spotted bats. Waters under the jurisdiction of USACOE and CDFW are also anticipated to be impacted along with red willow thicket plant community. Mitigation measures have been developed that include restoration, water permitting and limiting construction to the non-breeding season to reduce the impacts to below the level of significance.
U.S. Borax, Owens Lake Expansion Project	Approximately 10 miles southwest of the proposed project / proposed action site	No	The project involves the development of a trona ore processing facility at Owens Lake. The facility would consist of portable and mobile washing equipment located on the lake bed and a calcining and drying unit on the western shore. Possible impacts to biological resources are not known
LADWP Southern Owens Valley Solar Ranch Project	Approximately 12 miles north of the proposed project / proposed action site	No	The project involves the development of a 200 megawatt solar facility on 1,600 acres in the lower Owens River Valley. Possible impacts to biological resources are not known.
Desert Renewable Energy Conservation Plan (DRECP)	Plan Area covers about 22,587,000 acres, including proposed project / proposed action site	No	The DRECP is intended to conserve threatened and endangered species and natural communities in the Mojave and Colorado Desert regions of Southern California. Possible impacts to biological resources are not known.
Caltrans Highway 395 Olancha / Cartago Four-Lane Project	Approximately 7 miles west of the proposed project / proposed action site	Yes	The study involves the widening of the existing Caltrans Highway 395 between Olancha and Cartago. Impacts to biological resources will be mitigated under the provisions of the Caltrans and Federal Highway Administration. Anticipated biological impacts include those to Parish's popcorn-flower, Owens Valley checkerbloom, pygmy poppy, sanicle cymopterus, crowned mullia, bats, alkali skipper, Owens Valley vole, Swainson's hawk, least Bell's vireo, desert tortoise, and Mojave ground squirrel. Waters under the jurisdiction of USACOE and CDFW are also anticipated to be impacted.

TABLE 5.3.3.1-1
LIST OF CUMULATIVE PROJECTS WITHIN THE VICINITY OF THE PROPOSED PROJECT / PROPOSED ACTION FOR THE ANALYSIS OF CUMULATIVE IMPACTS TO BIOLOGICAL RESOURCES, *CONTINUED*

Project Name	Distance from Proposed Project / Proposed Action Site	Included in Cumulative Analysis?	Level of Impact to Biological Resources
			Impacts to biological resources will be minimized by implementing a well-designed biological resource mitigation plan.
Northland Power Independence, LLC Solar Project	Approximately 21 miles northwest of the proposed project / proposed action site	No	The 1,280-acre project involves the development of a 200 megawatt solar facility in the lower Owens River Valley. Possible impacts to biological resources are not known.

5.3.4 CUMULATIVE BIOLOGICAL RESOURCES IMPACTS

In consideration of the related past, present, or reasonably foreseeable, probable future projects, the incremental impact of the combined components of the proposed project / proposed action would not lead to a significant impact to biological resources. The potential impacts of the proposed project / proposed action can be evaluated within the context of the cumulative impacts of all ongoing and proposed development.

The proposed project / proposed action, in consideration with the 2008 SIP, the Owens Lake Master Project, the Lower Owens River Project Plan, and the Owens Lake Groundwater Evaluation Program, would not create considerable cumulative impacts to biological resources associated with the shadscale plant community and dune habitats. These projects have goals and objectives similar to those of the proposed project with regard to controlling dust emissions from the Keeler Dunes while allowing use of the project study areas as open space to support conservation of biological and cultural resources. The other four projects—Crystal Geyser Roxanne Cabin Bar Ranch Water Bottling Facility, U.S. Borax Owens Lake Expansion Project / Conditional Use Permit #02-13 / Reclamation Plant #02-1, LADWP Southern Owens Valley Solar Ranch Project, Desert Renewable Energy Conservation Plan, and California Department of Transportation Highway 395 Olancha/Cartago Four-Lane Project—have the potential to convert lands that are currently open space to developed lands. However, the proposed project / proposed action results in vegetation with native species and would not contribute to the cumulative effects of other development projects that would potentially affect habitats above the bed of Owens Lake.

The proposed project / proposed action would not alter "water of the United States" or waters of the State; therefore there would be no contribution to cumulative impacts to "waters of the US" or "waters of the State" in the Owens Valley Hydrologic Unit.

The proposed project / proposed action study area lacks riparian, wetland, and aquatic resources that provide important foraging habitat for migratory and resident species of wildlife. The proposed project would enhance the habitat through revegetation; therefore, the proposed project would not contribute to cumulative loss of native habitat in the upland areas surrounding bed of Owens Lake.

The proposed project / proposed action would not conflict with any applicable HCP or NCCP; therefore, there would be no contribution to cumulative impacts on adopted HCPs or NCCPs in the region.

5.3.4.1 OWENS DUNE WEEVIL

The proposed project / proposed action possibly may have negative impact the Owens dune weevil but the impacts are largely unknown because of a knowledge gap in the ecology of Owens dune weevil. The proposed project / proposed action may contribute to a small loss of habitat; however, impacts are not expected to affect the species at a population level given the presence of several other dune complexes around Owens Lake. The remaining Owens dune weevil habitat in the Owens Valley will not be impacted as a result of the proposed project / proposed action, resulting in an overall conservation of the species and its habitat. Further, given the paucity of ecological information, the addition of vegetation to the dunes may not result in habitat loss for this species or may simply affect habitat quality without completely eliminating habitat. Presumably, there is a threshold in which vegetation becomes too abundant for dune species, but further research would be required to understand this potential threshold.

5.4 CULTURAL RESOURCES

Cumulative impacts to cultural resources take into account the impacts of the proposed project / proposed action or an alternative as well as those likely to occur as a result of other existing, proposed and reasonably foreseeable projects. When analyzing cumulative impacts to cultural resources, an assessment is made of the impacts on individual resources as well as the inventory of cultural resources within the cumulative impact analysis area.

5.4.1 GEOGRAPHIC SCOPE

The cumulative impacts of the proposed project / proposed action to cultural resources is defined as the incremental physical impact of the proposed project / proposed action or an alternative when added to other closely related past; present; and reasonably foreseeable, probable future projects.

The regulations implementing Section 106 of the NHPA encourage close coordination between the NEPA and NHPA processes (36 CFR §800.8), and expressly integrate consideration of cumulative concerns within the analysis of a proposed action's potential direct and indirect effects by defining "adverse effect" to include "reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative" (36 CFR §800.5(a)(1)).

The Council on Environmental Quality provides that when establishing the proper geographic scope, the boundaries should not be too broad as to make the analysis unwieldy, nor to narrow as to miss significant issues. Additionally, the EPA provides that for non-ecological resources, other geographic areas should be considered, such as historic districts (for cultural resources). With this guidance in mind, the geographic scope for the analysis of cumulative impacts related to cultural resources within the Owens Valley Planning Area. More specifically, the geographic scope is defined as the dune complexes within the observed disturbance limits and the Owens River corridor.

5.4.2 TIMEFRAME

The timeframe refers to the duration over which an impact would occur: short-term or long-term. Short-term impacts to cultural resources would occur during the construction period in association with ground disturbance. Long-term impacts to cultural resources would occur as a result of any changes caused by development of the project over its life (in perpetuity).

Determining the temporal scope requires estimating the length of time the effects of the proposed project / proposed action will last, either individually or in combination with other anticipated effects. The temporal scope of impacts to cultural resources during the development of cumulative projects would be through the end of project maintenance, because any direct or indirect effects of the project would only occur during the life of the project.

5.4.3 EXISTING CUMULATIVE CONDITIONS

There are 21 cultural resources (4 archaeological sites and 17 archaeological isolates) within the proposed project / proposed action APE. Previous studies in the geographic scope have noted hundreds of archaeological sites within the vicinity of Owens Lake. These analyses have documented a wide variety of resources including temporary camps, lithic scatters, ceramic and lithic scatters, rock features, historic period sites, historic buildings and structures, and prehistoric and historic isolates.[1,2]

5.4.3.1 PAST, PRESENT AND REASONABLY FORESEEABLE PROJECTS

Cumulative conditions to cultural resources involve the disturbance of culturally significant resources and alteration of the historic and cultural landscape of the area over time. In the past, cultural resources have sometimes been damaged or destroyed by development projects resulting in the loss of potential knowledge. This has become less common in recent years, especially for projects undergoing environmental review under NEPA or CEQA, as laws now provide various protections for cultural resources.

Development projects in the region have resulted in the damage or destruction of cultural resources. Likewise, various human activities have taken place in the project area in the past and certain activities, such as recreation and agricultural endeavors, continue today. In recent times, the severity of impacts to previously unknown cultural resources has been reduced by implementing mitigation measures requiring construction monitoring, evaluation of resources discovered during monitoring, and avoidance or data recovery for significant resources.

A list of the existing and reasonably foreseeable cumulative projects is provided in Table 5.4.3.1-1, *List of Cumulative Projects in the Vicinity of the Proposed Project / Proposed Action for the Analysis of Cumulative Impacts to Cultural Resources*; cumulative projects are mapped in Figure 5.03-1, *Cumulative Projects in the Vicinity of the Proposed Project / Proposed Action*. These projects include proposed or approved projects that have either undergone independent environmental review pursuant to NEPA and/or CEQA or will do so prior to approval. Even if environmental review has not be completed for the projects described in Table 5.4.3.1-1, their potential effects were considered in the cumulative impacts analyses in this EA/EIR for the geographic area described above. These projects are in the various stages of permitting or construction.

[1] Wells, H. 2003. *Cultural Resources Survey for 2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan, Final Report*. Prepared by Sapphos Environmental, Inc. Pasadena, CA.

[2] Sapphos Environmental, 2007. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan, Cultural Resources Technical Report*. Prepared for Great Basin Unified Air Pollution Control District, Bishop, CA.

TABLE 5.4.3.1-1
LIST OF CUMULATIVE PROJECTS WITHIN THE VICINITY OF THE PROPOSED PROJECT / PROPOSED ACTION FOR THE ANALYSIS OF CUMULATIVE IMPACTS TO CULTURAL RESOURCES

Project Name	Distance from Proposed Project / Proposed Action Site	Included in Cumulative Analysis?	Level of Impact to Cultural Resources
Owens Lake Dust Control Program	Less than 1 mile from the project site	Yes	This project involves the construction, operation, and maintenance of Dust Control Measures over an approximately 110-square mile area of the dried Owens lakebed. Implementation of the proposed project / proposed action has the potential to result in a substantial adverse change to the significance of archaeological and historical resources, and unknown burial sites. It was determined that with the implementation of avoidance, minimization, and mitigation measures, the project would have a less than significant impact to cultural resources and more specifically reduce any adverse effects on historic properties.
Lower Owens River Project	Approximately 2 miles west of the proposed project / proposed action site	Yes	The project involved large-scale habitat restoration in the Owens Valley north of Owens Lake. The construction of access routes and a ditch has the potential to impact several cultural sites, both historic and prehistoric. Implementation of mitigation measures is expected to reduce impacts to below the level of significance.
Owens Lake Master Project	Less than 1 mile from the proposed project / proposed action site	No	This project involves the development of framework for the management of resources at Owens Lake. Possible impacts to cultural resources are not known.
Owens Lake Groundwater Evaluation Program	Less than 1 mile from the proposed project / proposed action site	No.	The LADWP is evaluating Owens Lake groundwater for supplying water to a portion of the dust control activities. Possible impacts to cultural resources are not known.
Crystal Geyser Roxane Cabin Bar Ranch Water Bottling Facility	Approximately 16 miles southwest of the proposed project / proposed action site	Yes	This project involves the construction of a spring water bottling facility and ancillary facilities. There are no known cultural resources that will be impacted by the project. However, unknown or buried archaeological resources may be impacted by the project. Mitigation measures have been developed that include archaeological and Native American monitoring of construction activities to reduce the impacts to below the level of significance.
U.S. Borax, Owens Lake Expansion Project	Approximately 10 miles southwest of the proposed	No	The project involves the development of a trona ore processing facility at Owens Lake. The facility would consist of portable and mobile washing equipment located on the lakebed and a calcining and drying unit

TABLE 5.4.3.1-1
LIST OF CUMULATIVE PROJECTS WITHIN THE VICINITY OF THE PROPOSED PROJECT / PROPOSED ACTION FOR THE ANALYSIS OF CUMULATIVE IMPACTS TO CULTURAL RESOURCES, *CONTINUED*

Project Name	Distance from Proposed Project / Proposed Action Site	Included in Cumulative Analysis?	Level of Impact to Cultural Resources
	project / proposed action site		on the western shore. Possible impacts to cultural resources are not known
LADWP Southern Owens Valley Solar Ranch Project	Approximately 12 miles north of the proposed project / proposed action site	No	The project involves the development of a 200-megawatt solar facility on 1,600 acres in the lower Owens River Valley. Possible impacts to cultural resources are not known
Desert Renewable Energy Conservation Plan (DRECP)	Plan Area covers about 22,587,000 acres, including proposed project / proposed action site	Yes	The DRECP is intended to conserve threatened and endangered species and natural communities in the Mojave and Colorado Desert regions of Southern California. The Area of Critical Environmental Concern (ACEC) created for the plan prohibits the development of renewable energy within 500 meters of the late-Pleistocene / Holocene shorelines; therefore, there would be no impacts or adverse effects to cultural resources within the ACEC.
Caltrans Highway 395 Olancha/Cartago Four-Lane Project	Approximately 7 miles west of the proposed project / proposed action site	Yes	The study involves the widening of the existing Caltrans Highway 395 between Olancha and Cartago. The project identified 275 cultural resources within the Area of Potential Effects. Seventy-one sites were determined to be exempt under a Programmatic Agreement with the California Office of Historic Preservation. The evaluations of 62 sites were postponed until the preferred alternative is selected, to avoid unnecessary disruption of these sites. Of the remaining 213 sites, seven had already been evaluated for eligibility for listing on the National Register of Historic Places. Four sites had been previously determined eligible for listing on the National Register of Historic Places (NRHP). Testing was conducted on the remaining 132 sites and indicated that a further 13 sites are eligible for listing on the NRHP. Impacts to cultural resources will be mitigated under the provisions of the Caltrans, Federal Highway Administration, and the BLM project specific Memorandum of Agreement for Compliance with Section 106 of the NHPA.

TABLE 5.4.3.1-1
LIST OF CUMULATIVE PROJECTS WITHIN THE VICINITY OF THE PROPOSED PROJECT / PROPOSED ACTION FOR THE ANALYSIS OF CUMULATIVE IMPACTS TO CULTURAL RESOURCES, *CONTINUED*

Project Name	Distance from Proposed Project / Proposed Action Site	Included in Cumulative Analysis?	Level of Impact to Cultural Resources
Northland Power Independence, LLC Solar Project	Approximately 5 miles east of Independence, CA	No	The 1,280-acre project involves the development of a 200 megawatt solar facility in the lower Owens River Valley. Possible impacts to cultural resources are not known.

Note: The information provided in this table is based upon project documentation that has been made available to the public.

5.4.4 CUMULATIVE CULTURAL RESOURCES IMPACTS

In consideration of the related past, present, or reasonably foreseeable, probable future projects as listed in Table 5.4.3.1-1, the incremental impact of the combined components of the proposed project / proposed action would not lead to an adverse effect or a significant impact to cultural resources.

Implementation of the proposed project / proposed action would not have a cumulatively considerable impact to historic resources, as the project has been designed to avoid direct and indirect impacts to culturally sensitive areas identified within the geographic scope for cumulative projects. In addition, the proposed project / proposed action or an alternative would not contribute to cumulative impacts on unique archaeological resources pursuant to CEQA, as no such resources are present within the APE. Lastly, implementation of the proposed project / proposed action would not result in the disturbance of any known human remains, including those interred outside of formal cemeteries. Therefore, the project would not make a significant contribution to cumulative impacts related to disturbance of human remains.

Exposed cultural deposits are at greater risks of loss and damage due to vandalism. As discussed in Section 1.8.3, *Protecting Environmentally Sensitive Areas from Acceleration of Exposure*, the proposed project / proposed action would create a natural dune environment that would reduce wind speed at the ground surface and, consequently, act as a stabilizing measure during high wind events. As such, it is expected that the implementation of the proposed project / proposed action would lead to the greater preservation of sensitive cultural resources within the project area.

In summary, the cultural resources impact of the proposed project / proposed action would not be considerable when viewed in connection with the effects of the related past; current; and reasonably foreseeable, future projects.

5.5 GEOLOGY AND SOILS

5.5.1 GEOGRAPHIC SCOPE

The geographic scope for analysis of cumulative impacts related to geology and soil resources is limited to the proposed project / proposed action study area. Any potential impacts associated with geology and soil resources related to construction and operation of the proposed project / proposed action or an alternative would be site-specific and would only occur within the boundaries of the proposed project / proposed action study area. Therefore, the geographic scope for geology and soils is highly localized.

5.5.2 TIMEFRAME

The timeframe refers to short-term and long-term impacts to geology and soils. Short-term impacts to geology and soils would occur during construction in association with earthmoving activities such as grading and excavation to install temporary wind breaks. Examples of long-term impacts associated with geology and soils include seismic hazards throughout the life of the proposed project / proposed action.

5.5.3 EXISTING CUMULATIVE CONDITIONS

The proposed project / proposed action study area consists of largely undeveloped land covered by aeolian and alluvial sediments. No occupied structures are present within the proposed project / proposed action study area as it is primarily an unpopulated dune field. No past, present, or reasonably foreseeable projects identified in Figure 5.03-1, *Cumulative Projects in the Vicinity of the Proposed Project / Proposed Action*, align through, or are within, the proposed project / proposed action study area. These projects include proposed or approved projects that have either undergone independent environmental review pursuant to NEPA and/or CEQA or will do so prior to approval. Even if environmental review has not be completed for the projects described in Table 5.5.3-1, *List of Cumulative Projects within the Vicinity of the Proposed Project / Proposed Action for the Analysis of Cumulative Impacts to Geology and Soils*, their potential effects were considered in the cumulative impacts analyses in this EIR/EA for the geographic area described above. These projects are in the various stages of permitting or construction.

Only the proposed project / proposed action or an alternative would occupy the proposed project / proposed action study area. As a result, the proposed project / proposed action or an alternative would not combine with another project or contribute to existing cumulative conditions with regard to geology and soils. Therefore, existing cumulative conditions relevant to geology and soils are characterized only for the proposed project / proposed action or an alternative.

TABLE 5.5.3-1
LIST OF CUMULATIVE PROJECTS WITHIN THE VICINITY OF THE PROPOSED PROJECT / PROPOSED ACTION FOR THE ANALYSIS OF CUMULATIVE IMPACTS TO GEOLOGY AND SOILS

Project Name	Distance from Project Site	Included in Cumulative Analysis?	Level of Impact to Geology and Soils
Owens Lake Dust Control Program	Less than 1 mile from the proposed project / proposed action site	No	This project involves the construction, operation, and maintenance of Dust Control Measures over an approximately 110-square-mile area of the Owens Lake Bed. Implementation of the project would not result in significant impacts associated with geology and soils.
Lower Owens River Project	Approximately 2 miles west of the proposed project / proposed action site	No	The project involved large-scale habitat restoration in the Owens Valley north of Owens Lake. Implementation of the project would not result in significant impacts associated with geology and soils.
Owens Lake Master Project	Less than 1 mile from the proposed project / proposed action site	No	This project involves the development of framework for the management of resources at Owens Lake. Implementation of the project would not result in significant impacts associated with geology and soils.
Owens Lake Groundwater Evaluation Program	Less than 1 mile from the proposed project / proposed action site	No	The LADWP is evaluating Owens Lake groundwater for supplying water to a portion of the dust control activities. Implementation of the project would not result in significant impacts associated with geology and soils.
Crystal Geyser Roxane Cabin Bar Ranch Water Bottling Facility	Approximately 16 miles southwest of the proposed project / proposed action site	No	This project involves the construction of a spring water bottling facility and ancillary facilities. Implementation of the project would not result in significant impacts associated with geology and soils.
U.S. Borax, Owens Lake Expansion Project	Approximately 10 miles southwest of the proposed project / proposed action site	No	The project involves the development of a trona ore processing facility at Owens Lake. The facility would consist of portable and mobile washing equipment located on the lake bed and a calcining and drying unit on the western shore. Implementation of the project would not result in significant impacts associated with geology and soils within the Keeler Dunes.
LADWP Southern Owens Valley Solar Ranch Project	Approximately 12 miles north of the proposed project / proposed action site	No	The project involves the development of a 200-megawatt solar facility on 1,600 acres in the lower Owens River Valley. Implementation of the project would not result in significant impacts associated with geology and soils within the Keeler Dunes.
Desert Renewable Energy Conservation Plan	Plan area covers about 22,587,000 acres, including proposed project / proposed action site	No	The Desert Renewable Energy Conservation Plan (DRECP) is intended to conserve threatened and endangered species and natural communities in the Mojave and Colorado Desert regions of Southern California. Implementation of the project would not result in significant impacts associated with geology and soils within the Keeler Dunes.

TABLE 5.5.3-1
LIST OF CUMULATIVE PROJECTS WITHIN THE VICINITY OF THE PROPOSED PROJECT / PROPOSED ACTION FOR THE ANALYSIS OF CUMULATIVE IMPACTS TO GEOLOGY AND SOILS, *CONTINUED*

Project Name	Distance from Project Site	Included in Cumulative Analysis?	Level of Impact to Geology and Soils
Caltrans Highway 395 Olancha/Cartago Four-Lane Project	Approximately 7 miles west of the proposed project / proposed action site	Yes	The study involves the widening of the existing Caltrans Highway 395 between Olancha and Cartago. Potential impacts to geology and soils, including seismic hazards and unstable soils, will be mitigated through project design. Implementation of the project would not result in significant impacts associated with geology and soils within the Keeler Dunes.
Northland Power Independence, LLC Solar Project	Approximately 5 miles east of Independence, CA	No	The 1,280-acre project involves the development of a 200-megawatt solar facility in the lower Owens River Valley. Possible impacts to geology and soils within the project area are not known. Implementation of the project would not result in significant impacts associated with geology and soils within the Keeler Dunes.

5.5.4 CUMULATIVE IMPACTS TO GEOLOGY AND SOILS

5.5.4.1 GROUND SHAKING

The proposed project / proposed action site is in the seismically active Owens Valley of Eastern California. However, the proposed project / proposed action is not located in an APEFZ and does not involve the construction of buildings or structures; therefore, there is little or no exposure of people to injury or loss of life, and there are no structures that would be exposed to damage. Therefore, ground shaking impacts are not expected to combine with similar impacts of past, present, or reasonably foreseeable projects. The proposed project / proposed action would have a less than cumulatively considerable contribution to ground shaking impacts. Thus, cumulative impacts associated with ground shaking would be less than cumulatively considerable. The incremental impacts of the proposed project / proposed action, when considered with the related past, present, or reasonably foreseeable probable future projects, would not be expected to result in significant impacts related to geology and seismic hazards.

5.5.4.2 LIQUEFACTION / UNSTABLE SOILS

Due to the differences in soil compaction and groundwater depth, the conditions for liquefaction may be present in certain regions of the proposed project / proposed action study area. However, the proposed project / proposed action does not involve the construction of buildings or structures; therefore, there is little or no exposure of people to injury or loss of life and there are no structures that would be exposed to damage. Therefore, the potential for soils in selected areas to liquefy would not be expected to combine with similar impacts of past, present, or reasonably foreseeable projects. The proposed project / proposed action would have a less than cumulatively considerable contribution to liquefaction and unstable soils. Thus, cumulative impacts associated with liquefaction would be less than cumulatively considerable. The incremental impacts of the proposed project / proposed action, when considered with the related past, present, or reasonably foreseeable probable future projects, would not be expected to result in significant impacts related to liquefaction and unstable soils.

5.5.4.3 Soil Erosion

Construction soil erosion impacts are considered potentially significant short-term, site-specific impacts. However, the District and the BLM have required that erosion be controlled on-site with site-specific measures, a grading plan approved by the County Engineer, implementation of a dust control plan (Rule 801), and compliance with the NPDES Construction General Permit. Therefore, soil erosion impacts are not expected to combine with similar impacts of past, present, or reasonably foreseeable probable future projects. The proposed project / proposed action would have a less than cumulatively considerable contribution to soil erosion impacts. Thus, cumulative impacts associated with soil erosion would be less than cumulatively considerable.

5.5.4.4 Expansive Soils

The majority of soils in the proposed project / proposed action study area are gravelly alluvium and coarse loamy aeolian sands. These types of soils do not exhibit shrink-swell patterns and are not considered expansive soils. Therefore, expansive soil impacts are not expected to combine with similar impacts of past, present, or reasonably foreseeable probable future projects. The proposed project / proposed action would have a less than cumulatively considerable contribution to expansive soils impacts. Thus, cumulative impacts associated with expansive soils would be less than cumulatively considerable.

5.5.4.5 Differential Settlement

It is possible differential settlement in the proposed project / proposed action study area could occur from liquefaction or unconsolidated soils. However, the proposed project / proposed action does not involve the construction of buildings or structures; therefore, there is little or no exposure of people to injury or loss of life, and there are no structures that would be exposed to damage as a result of differential settlement of building foundations.

5.5.4.6 Mineral Resources

Trace amounts of valued mineral resources may have been transported into the proposed project / proposed action study area through the alluvial fan, but there are no substantial mineral resources identified within the proposed project / proposed action study area. The proposed project / proposed action involves the installation of straw bales and planting of native vegetation that does not require grading; therefore, the proposed project / proposed action would not hinder recovery of mineral resources or contribute cumulatively to lose of recoverable resources with combined with similar impacts of past, present, or reasonably foreseeable probable future projects.

5.6 PALEONTOLOGICAL RESOURCES

Cumulative impacts to paleontological resources take into account the impacts of the proposed project / proposed action or an alternative as well as those likely to occur as a result of other existing, proposed, and reasonably foreseeable projects. When analyzing cumulative impacts to paleontological resources, an assessment is made of the impacts on individual resources as well as the inventory of paleontological resources within the cumulative impact analysis area.

5.6.1 GEOGRAPHIC SCOPE

The cumulative impacts of the proposed project / proposed action to paleontological resources is defined as the incremental physical impact of the proposed project / proposed action or an alternative when added to other closely related past, present, and reasonably foreseeable probable future projects.

The regulations implementing Section 106 of the NHPA contemplate encourage close coordination between the NEPA and NHPA processes (36 CFR §800.8), and expressly integrate consideration of cumulative concerns within the analysis of a proposed action's potential direct and indirect effects by defining "adverse effect" to include "reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative" (36 CFR §800.5(a)(1)).

The Council on Environmental Quality (CEQ) provides that when establishing the proper geographic scope, the boundaries should not be too broad as to make the analysis unwieldy, nor too narrow as to miss significant issues. Additionally, the EPA provides that for non-ecological resources, other geographic areas should be considered. With this guidance in mind, the geographic scope for the analysis of cumulative impacts related to paleontological resources within the Owens Valley Planning Area. More specifically, the geographic scope is defined as the area incorporating Owens Lake, the southern Owens Valley, and surrounding environs.

5.6.2 TIMEFRAME

The timeframe refers to the duration over which an impact would occur: short-term or long-term. Short-term impacts to paleontological resources would occur during the construction period in association with ground disturbance. Long-term impacts would occur as a result of any changes caused by development of the proposed project / proposed action over its life (in perpetuity).

Determining the temporal scope requires estimating the length of time the effects of the proposed project / proposed action will last, either individually or in combination with other anticipated effects. The temporal scope of impacts to paleontological resources during the development of cumulative projects would be through the end of project maintenance, because any direct or indirect effects of the project would only occur during the life of the project.

5.6.3 EXISTING CUMULATIVE CONDITIONS

The proposed project / proposed action site is located in the Owens Valley within the larger Basin and Range physiographic province. The proposed project / proposed action site is directly underlain by geologic units comprised of Quaternary alluvial and lake deposits. Paleontological resources surveys conducted along the lake margin immediately northwest of Keeler Dunes have identified a number of Late Pleistocene and recent faunal remains in the lacustrine deposits including artiodactyl, rodent, bird, and freshwater shell.

5.6.3.1 PAST, PRESENT AND REASONABLY FORESEEABLE PROJECTS

Cumulative impacts to paleontological resources involve the loss of non-renewable scientifically important fossils and associated data, and the incremental loss to science and society of these resources over time. In the past, paleontological resources have sometimes been damaged or destroyed by development projects resulting in the loss of potential knowledge. This has become less common in recent years, especially for projects undergoing environmental review under NEPA or CEQA, as laws now provide various protections for paleontological resources.

Development projects in the region have resulted in the damage or destruction of paleontological resources. In recent times, the severity of impacts to previously unknown paleontological resources has been reduced by implementing mitigation measures requiring construction monitoring, evaluation of resources discovered during monitoring, and avoidance or data recovery for significant resources.

A list of the existing and reasonably foreseeable cumulative projects is provided in Table 5.6.3.1-1, *List of Cumulative Projects in the Vicinity of the Proposed Project / Proposed Action for the Analysis of Cumulative Impacts to Paleontological Resources*; cumulative projects are mapped in Figure 5.03-1, *Cumulative Projects in the Vicinity of the Proposed Project / Proposed Action*. These projects include proposed or approved projects that have either undergone independent environmental review pursuant to NEPA and/or CEQA or will do so prior to approval. Even if environmental review has not be completed for the projects described in Table 5.6.3.1-1, their potential effects were considered in the cumulative impacts analyses in this EA/EIR for the geographic area described above. These projects are in the various stages of permitting or construction.

TABLE 5.6.3.1-1
LIST OF CUMULATIVE PROJECTS WITHIN THE VICINITY OF THE PROPOSED PROJECT / PROPOSED ACTION FOR THE ANALYSIS OF CUMULATIVE IMPACTS TO PALEONTOLOGICAL RESOURCES

Project Name	Distance from Proposed Project / Proposed Action Site	Included in Cumulative Analysis?	Level of Impact to Paleontological Resources[1]
Owens Lake Dust Control Program	Less than 1 mile from the proposed project / proposed action site	Yes	This project involves the construction, operation, and maintenance of DCMs over an approximately 110-square mile area of the dried Owens lakebed. Implementation of the proposed project / proposed action has the potential to result in the destruction of unique paleontological resources. It was determined that with the implementation of avoidance, minimization, and mitigation measures, the project would have a less than significant impact to paleontological resources.

[1] The information provided in this table is based upon project documentation that has been made available to the public.

TABLE 5.6.3.1-1
LIST OF CUMULATIVE PROJECTS WITHIN THE VICINITY OF THE PROPOSED PROJECT / PROPOSED ACTION FOR THE ANALYSIS OF CUMULATIVE IMPACTS TO PALEONTOLOGICAL RESOURCES, *CONTINUED*

Project Name	Distance from Proposed Project / Proposed Action Site	Included in Cumulative Analysis?	Level of Impact to Paleontological Resources[1]
Lower Owens River Project	Approximately 2 miles west of the proposed project / proposed action site	No	The project involved large-scale habitat restoration of the Owens River north of Owens Lake. Impacts to paleontological resources were not addressed for this project.
Owens Lake Master Project	Less than 1 mile from the proposed project / proposed action site	No	This project involves the development of framework for the management of resources at Owens Lake. There are no paleontological resources that would be impacted by this project.
Owens Lake Groundwater Evaluation Program	Less than 1 mile from the proposed project / proposed action site	No	The LADWP is evaluating Owens Lake groundwater for supplying water to a portion of the dust control activities. Possible impacts to paleontological resources are not known.
Crystal Geyser Roxane Cabin Bar Ranch Water Bottling Facility	Approximately 16 miles southwest of the proposed project / proposed action site	Yes	This project involves the construction of a spring water bottling facility and ancillary facilities. There are no known paleontological resources that will be impacted by the project. However, unknown or buried paleontological resources may be impacted by the project. Mitigation measures have been developed that include paleontological monitoring of construction activities to reduce the impacts to below the level of significance.
U.S. Borax, Owens Lake Expansion Project	Approximately 10 miles southwest of the proposed project / proposed action site	No	The project involves the development of a trona ore processing facility at Owens Lake. The facility would consist of portable and mobile washing equipment located on the lakebed and a calcining and drying unit on the western shore. Possible impacts to paleontological resources are not known.
LADWP Southern Owens Valley Solar Ranch Project	Approximately 12 miles north of the proposed project / proposed action site	No	The project involves the development of a 200-megawatt solar facility on 1,600 acres in the lower Owens River Valley. Possible impacts to paleontological resources are not known.
Desert Renewable Energy Conservation Plan (DRECP)	Plan area covers about 22,587,000 acres, including proposed project / proposed action site	Yes	The DRECP is intended to conserve threatened and endangered species and natural communities in the Mojave and Colorado Desert regions of Southern California. Possible impacts to paleontological resources are not known.

TABLE 5.6.3.1-1
LIST OF CUMULATIVE PROJECTS WITHIN THE VICINITY OF THE PROPOSED PROJECT / PROPOSED ACTION FOR THE ANALYSIS OF CUMULATIVE IMPACTS TO PALEONTOLOGICAL RESOURCES, *CONTINUED*

Project Name	Distance from Proposed Project / Proposed Action Site	Included in Cumulative Analysis?	Level of Impact to Paleontological Resources[1]
Caltrans Highway 395 Olancha/ Cartago Four-Lane Project	Approximately 7 miles west of the proposed project / proposed action site	Yes	The study involves the widening of the existing Caltrans Highway 395 between Olancha and Cartago. Paleontological resources have been identified within the type of alluvial fan within the project area. Current environmental documentation recommends further studies to determine if mitigation is required. If it is determined necessary, Caltrans would implement a paleontological resource mitigation plan following Caltrans guidelines to salvage fossil specimens during construction excavation for this project. Implementation of the plan could minimize any adverse impacts to paleontological resources.
Northland Power Independence, LLC Solar Project	Approximately 5 miles east of Independence, CA	No	The 1,280-acre project involves the development of a 200-megawatt solar facility in the lower Owens River Valley. Possible impacts to paleontological resources are not known.

5.6.4 CUMULATIVE PALEONTOLOGICAL RESOURCES IMPACTS

In consideration of the related past, present, or reasonably foreseeable probable future projects as listed in Table 5.6.3.1-1, the incremental impact of the combined components of the proposed project / proposed action would not lead to an adverse effort or a significant impact to paleontological resources. With regard to paleontological resources, implementation of the proposed project / proposed action or an alternative is not expected to contribute to cumulative impacts associated with the destruction of unique paleontological resources or unique geologic features.

In summary, the paleontological resources impact of the proposed project / proposed action, when viewed in connection with the effects of the related past, current, and reasonably foreseeable future projects, would not be expected to result in significant impacts related to paleontological resources.

5.7 GREENHOUSE GAS EMISSIONS AND GLOBAL CLIMATE CHANGE

5.7.1 GEOGRAPHIC SCOPE

The proposed project / proposed action is located immediately northwest of the community of Keeler in Inyo County, California. The proposed project / proposed action consists of dust control measures (DCMs) applied to 194 acres within a 1.36-square-mile study area. The study area is bounded approximately by the Inyo Mountains on the east-northeast and the historic shoreline of Owens Lake west-southwest, and extends approximately 2.5 miles to the northwest from the community of Keeler. SR 136 bisects the study area. The proposed project / proposed action is located on lands administered by the BLM Bishop Office and the LADWP. Other stakeholders include Inyo County, the local Lone Pine-Paiute Shoshone Tribe, Caltrans District 9, Keeler Community Services District, and Keeler residents.

5.7.2 TIMEFRAME

The timeframe refers to the duration over which an impact would occur: short-term or long-term. Short-term impacts to greenhouse gas (GHG) emissions and global climate change would occur during the construction phase of the proposed project / proposed action in association with the addition of construction equipment to the landscape. Installation of the proposed project / proposed action would require a maximum of 11 months to complete. Construction of the proposed project / proposed action would be divided into the following parts: (1) preparation of temporary access routes and staging areas, (2) bale placement and planting and watering, and (3) project oversight and monitoring and supplemental watering (up to two per year for 3 years) and additional planting as required. Based on the nature of the proposed project / proposed action as a revegetation project to control dust, no long-term impacts to GHG emissions and global climate change are anticipated in association with the operations and maintenance, or monitoring phase of the proposed project / proposed action. Very small increases in traffic volumes associated with operations would occur and are not anticipated to adversely impact GHG emissions and climate change during the operational life of the proposed project / proposed action (approximately 3 years).

5.7.3 EXISTING CUMULATIVE CONDITIONS

In order to establish a reference point for future GHG emissions, CO_{2e} emissions have been projected based on an unregulated, business as usual, GHG emissions scenario that does not consider the reductions in GHG emissions required by Executive Order S-3-05 or AB 32. CARB has stated that California contributed 427 million metric tons of GHG emissions in CO_{2e} in 1990 and, under a business as usual development scenario, will contribute approximately 596 million metric tons of CO_{2e} emissions in 2020, which presents a linear upward trend in California's total GHG emissions. To characterize the business as usual GHG emissions specifically for Inyo County, information on population has been collected from the California Department of Finance. It has been projected that the population of Inyo County will increase by approximately 27 percent from 2010 to 2050.[1] Using the current CO_{2e} emissions factor of 14 metric tons per capita,[2] Inyo County would be responsible for

[1] California Department of Finance. May 2012. *Interim Population Projections for California and Its Counties 2010-2050.* Available at: http://www.dof.ca.gov/research/demographic/reports/projections/interim/view.php

[2] California Air Resources Board. 15 October 2008. *Climate Change Proposed Scoping Plan: A Framework for Change.* Available at: http://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm

the emission of approximately 0.26 million metric ton of CO_{2e} in 2010 and 0.33 million metric ton of CO_{2e} in 2050 under a business as usual emissions scenario (Table 5.7.3-1, *Characterization of Business as Usual GHG Emissions for Inyo County*).

TABLE 5.7.3-1
CHARACTERIZATION OF BUSINESS AS USUAL GHG EMISSIONS FOR INYO COUNTY

	Year						
	1990	2000	2010	2020	2030	2040	2050
Population	18,281	17,945	18,624	19,388	20,657	22,091	23,618
CARB emission factor (metric tons of CO_{2e} *per capita*)	14	14	14	14	14	14	14
Annual GHG emissions for Inyo County (million metric tons of CO_{2e})	0.26	0.25	0.26	0.27	0.29	0.31	0.33

Sources:
California Department of Finance. May 2012. *Interim Population Projections for California and Its Counties 2010-2050*. Available at: http://www.dof.ca.gov/research/demographic/reports/projections/interim/view.php

California Department of Finance. August 2011. *Historic Census Populations of Counties and Incorporated Cities in California 1850-2010*. Available at: http://www.dof.ca.gov/research/demographic/state_census_data_center/historical_census_1850-2010/view.php

5.7.3.1 Greenhouse Gas Emissions

The proposed project / proposed action's global climate change impacts were analyzed quantitatively considering the proposed project / proposed action's operational scenario, size, and location. To quantify the amount of GHG emissions contributed by construction and operation of the proposed project / proposed action, the CalEEMod emissions model and the California Climate Action Registry's General Reporting Protocol were used. The proposed project / proposed action would be expected to have the potential to result in significant impacts related to global climate change if the proposed project / proposed action conflicts with the goal of reducing California's GHG emissions to the 1990 levels (427 million metric tons CO_{2e}, which is equivalent to approximately 10 metric tons CO_{2e} per capita) by 2020 as required by AB 32. Based on the suggested thresholds proposed by the CAPCOA,[3] the proposed project / proposed action would be expected to have the potential to result in significant impacts related to global climate change if the proposed project / proposed action emits more than 25,000 metric tons of CO_{2e} per year.

5.7.3.2 Qualitative Analysis of Greenhouse Gas Emission Impacts

The proposed project / proposed action's incremental impact to GHG emissions would be potentially significant if the size, nature, or duration of the construction phase would emit a substantial amount of GHGs. The construction phase of the proposed project / proposed action would take approximately 11 months to complete and would include the entire 194-acre proposed project / proposed action area.

[3] California Air Pollution Control Officers Association. January 2008. *CEQA and Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act*. Sacramento, CA. Voluntary Reporting of Greenhouse Gases, U.S. Department of Energy, Energy Information Administration (16 pp, 111K, About PDF)

During delivery of straw bales and planting, heavy-duty equipment would be operated, which, together with the large area under construction, would be expected to produce significant, but temporary, GHG emissions. Therefore, the GHG emissions due to the proposed project / proposed action's straw bale delivery and planting phases warrant a quantitative analysis.

During the operational phase, the proposed project / proposed action's GHG emissions would be expected to be below the level of significance. As described in the project description, the proposed project / proposed action is primarily the placement of straw bales and the planting of vegetation. Therefore, although the use of maintenance equipment for the proposed project / proposed action would be expected to emit GHGs, the operational phase would be expected to result in a net decrease in regional GHG emissions due to the generation of CO from the planting as well as a reduction of PM_{10} emissions. Operation of the proposed project / proposed action would not be expected to have a significant detrimental impact upon GHG emissions and would reduce GHG emissions in compliance with the goals of AB 32 by providing an additional sink for CO_{2e}, which would reduce GHG emissions compared to a business as usual scenario.

5.7.3.3 QUANTITATIVE ANALYSIS OF GREENHOUSE GAS EMISSION IMPACTS

Based on emissions modeling, construction activities would result in the emission of a maximum of approximately 3,668.47 metric tons of CO_{2e} per year (Table 5.7.3.3-1, *CO_2 and* CO_{2e} *Emissions of the Proposed Project / Proposed Action*). Operation of the proposed project / proposed action would result in the emission of approximately 2,696.38 metric tons of CO_{2e} per year. The operational GHG emissions can be attributed to mobile sources and use of operational equipment such as water trucks. However, it is anticipated that operation of the proposed project / proposed action would result in a net benefit to GHG emissions due to sequestration of approximately 836.14 metric tons of CO_{2e} per year by the native plants. Therefore, the overall impact of operation of the proposed project / proposed action would be expected to have no negative impact upon GHG emissions; would not trigger the reference point of 25,000 metric tons of direct CO_{2e} that would warrant detailed consideration in the NEPA review set forth in the draft Guidance by CEQ, would not exceed the CAPCOA reporting threshold of 25,000 metric tons per year, and would reduce GHG emissions in compliance with AB 32. Therefore, it is expected that the overall GHG emissions resulting from construction and operation of the proposed project / proposed action would be consistent with CEQ's guidance and would be below the level of significance.

TABLE 5.7.3.3-1
CO_2 AND CO_{2E} EMISSIONS OF THE PROPOSED PROJECT / PROPOSED ACTION

Construction Emission Sourced*	**CO_2 Emissions**	**CO_{2e} Emissions**
	Metric Tons/Year	**Metric Tons/Year**
Maximum Construction Emissions	**3,645.93**	**3,668.47**
Operational Emission Sources**	**Metric Tons/Year**	**Metric Tons/Year**
Operational Activity	1,856.42	1,868.06
ATVs	3.18	3.19
Water Trucks	818.58	823.71
Mobile Sources	1.41	1.42
Maximum Operational Emissions	**2,679.59**	**2,696.38**

In addition to coordinating with their internal planning personnel, the District and BLM contacted the State Lands Commission, Inyo County, and the LADWP to seek out information regarding past, present, and reasonably foreseeable probable future projects within the Owens Valley Planning Area. The District and the BLM identified nine past, present, and reasonably foreseeable probable future projects that were considered in the evaluation of the potential for the proposed project / proposed action to result in cumulative significant impacts (Table 5.7.3.3-2, *Past, Present, and Reasonably Foreseeable Projects in the Vicinity of the Proposed Project / Proposed Action for the Analysis of Cumulative Impacts to Greenhouse Gas Emissions and Global Climate Change*; and Figure 5.03-1, *Cumulative Projects in the Vicinity of the Proposed Project / Proposed Action*):

TABLE 5.7.3.3-2
PAST, PRESENT, AND REASONABLY FORESEEABLE PROJECTS IN THE VICINITY OF THE PROPOSED PROJECT / PROPOSED ACTION FOR THE ANALYSIS OF CUMULATIVE IMPACTS TO GREENHOUSE GAS EMISSIONS AND GLOBAL CLIMATE CHANGE

Project Name	Distance from Site	Included in Cumulative Analysis	Level of Impact to Greenhouse Gas Emissions and Global Climate Change
Owens Lake Dust Control Program	Less than 1 mile from proposed project / proposed action site	Yes.	Owens Lake Dust Control Program are not anticipated to cumulatively contribute to GHG emission impacts based on its timing. In addition, all projects are anticipated to implement air quality mitigation measures to reduce adverse impacts.
Caltrans Highway 395 Olancha/Cartago Four-Lane Project	Approximately 15 miles southwest of proposed project / proposed action site	No. The Caltrans Highway 395 Olancha/Cartago Four-Lane Project is neither within the 2.5 mile radius nor is it expected to be under construction simultaneously with the proposed project / proposed action.	The Caltrans Highway 395 Olancha/Cartago Four-Lane Project is not anticipated to cumulatively contribute to GHG emission impacts based on its location and timing. In addition, all projects are anticipated to implement air quality mitigation measures to reduce adverse impacts
Crystal Geyser Roxane Cabin Bar Ranch Water Bottling Facility	Located approximately 12.5 miles southwest from the southwest corner of proposed project / proposed action location	No. The Crystal Geyser Roxane Cabin Bar Ranch Water Bottling Facility is neither within the 2.5 mile radius nor will the facility be under construction simultaneously with the proposed project / proposed action.	The Crystal Geyser Roxane Cabin Bar Ranch Water Bottling Facility Project is not anticipated to cumulatively contribute to GHG emission impacts based on its location and timing. In addition, all projects are anticipated to implement air quality mitigation measures to reduce adverse impacts
Owens Lake Master Project	Less than 1 mile from proposed project / proposed action site	No.	The Owens Lake Master Project is not anticipated to cumulatively contribute to GHG emission impacts based on its location and timing. In addition, all projects are anticipated to implement air quality mitigation measures to reduce adverse impacts

TABLE 5.7.3.3-2
PAST, PRESENT, AND REASONABLY FORESEEABLE PROJECTS IN THE VICINITY OF THE PROPOSED PROJECT / PROPOSED ACTION FOR THE ANALYSIS OF CUMULATIVE IMPACTS TO GREENHOUSE GAS EMISSIONS AND GLOBAL CLIMATE CHANGE, *CONTINUED*

Project Name	Distance from Site	Included in Cumulative Analysis	Level of Impact to Greenhouse Gas Emissions and Global Climate Change
LADWP Southern Owens Valley Solar Ranch	Located approximately 15 miles northwest from the northwest corner of the proposed project / proposed action location	No. The LADWP Southern Owens Valley Solar Ranch is neither within the 2.5 mile radius nor is it expected to be under construction simultaneously with the proposed project / proposed action.	The LADWP Southern Owens Valley Solar Ranch is not anticipated to cumulatively contribute to GHG emission impacts based on its location and timing. In addition, all projects are anticipated to implement air quality mitigation measures to reduce adverse impacts
Owen Lake Groundwater Evaluation Program	Less than 1 mile from proposed project / proposed action site	No.	The Owen Lake Groundwater Evaluation Program is not anticipated to cumulatively contribute to GHG emission impacts based on its location and nature of the project. In addition, all projects are anticipated to implement air quality mitigation measures to reduce adverse impacts
U.S. Borax Owens Lake Expansion Project	Located approximately 10.0 miles southwest of the southwestern corner of the proposed project / proposed action location	No. The U.S. Borax Owens Lake Expansion Project is not within the 2.5 mile radius of the proposed project / proposed action.	The U.S. Borax Owens Lake Expansion Project is not anticipated to cumulatively contribute to GHG emission impacts based on its location. In addition, all projects are anticipated to implement air quality mitigation measures to reduce adverse impacts
Desert Renewable Energy Conservation Plan (DRECP)	Plan Area covers about 22,587,000 acres, including proposed project / proposed action site	Yes. The DRECP is within the 2.5 mile radius; however, the nature of the project does not generate air quality impacts.	The DRECP is not anticipated to cumulatively contribute to GHG emission impacts based on the nature of the project. In addition, all projects are anticipated to implement air quality mitigation measures to reduce adverse impacts
Lower Owens River Project	The southeastern corner of the Lower Owens River Project is located approximately 2.25 miles northwest from the northwestern corner of the proposed project / proposed action location	Yes. The Lower Owens River Project is within the 2.5 mile radius; however, the nature of the project does not generate air quality impacts.	The Lower Owens River Project is not anticipated to cumulatively contribute to GHG emission impacts based on the nature of the project.

5.7.4 CUMULATIVE GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE IMPACTS

In consideration of the related past, present, or reasonably foreseeable probable future projects, the incremental impact of the combined components of the proposed project / proposed action would not lead to a significant impact to GHG emissions. The potential impacts of the proposed project / proposed action can be evaluated within the context of the cumulative impacts of all ongoing and proposed development (Figure 5.03-1).

The proposed project / proposed action, in consideration with the Owens Lake Dust Control Program, the Owens Lake Master Project, the Lower Owens River Project, and the Owens Lake Groundwater Evaluation Program, would not contribute to significant cumulative impacts to GHG emissions. The goals and objectives of these related projects are similar to those of the proposed project / proposed action with regard to controlling the dust emissions from the Keeler Dunes while minimizing impacts to the environment. Of the other four projects, Geyser Roxanne Cabin Bar Ranch Water Bottling Facility, U.S. Borax, Owens Lake Expansion Project / Conditional Use Permit #02-13 / Reclamation Plant #02-1; LADWP Southern Owens Valley Solar Ranch Project; Desert Renewable Energy Conservation Plan; and California Department of Transportation Highway 395 Olancha/Cartago Four-Lane Project, none of these projects would be constructed during the same time period as the proposed project / proposed action. In sum, the GHG emissions impact of the proposed project / proposed action would not be cumulatively significant when viewed in connection with the greenhouse gas emissions and global climate change of the related past, current, and reasonably foreseeable probable future projects.

5.8 HYDROLOGY AND WATER QUALITY

Cumulative impacts on hydrology and water quality take into account the proposed project / proposed action's impacts as well as those likely to occur as a result of other existing, proposed, and reasonably foreseeable projects. When analyzing cumulative impacts on hydrology and water quality, an assessment is made of the impacts on the hydrology and water quality within the cumulative impact analysis area.

5.8.1 GEOGRAPHIC SCOPE

The geographic extent of this cumulative impacts analysis for hydrology and water quality impacts under the proposed project / proposed action or an alternative includes local and regional projects of hydrologic units within the Owens Lake watershed. The watershed unit code is 18090103 of the USDA National Resources Conservation Services, (NRCS).[1] The principal sources of inflow to Owens Lake include: the Owens River, Shallow Flood and Managed Vegetation dust control measures, and natural seeps and springs along the shoreline. The perennial creeks from the east-facing slopes of the Sierra Nevada are diverted into the Los Angeles Aqueduct prior to reaching Owens Lake.

5.8.2 TIMEFRAME

The timeframe refers to the duration over which an impact would occur: short-term or long-term. Short-term impacts to hydrology and water quality would occur during the construction period in association with groundwater or surface water quality or quantities in conjunction with installation of straw bales and native vegetation during the 11-month construction period. Long-term impacts to hydrology and water quality would occur as a result of any permanent changes in permeability of the ground surface in the proposed project / proposed action area, permanent alteration of surface drainage courses, or groundwater extractions that exceed the capacity for sustainable yield.

5.8.3 EXISTING CUMULATIVE CONDITIONS

5.8.3.1 PAST, PRESENT, AND REASONABLY FORESEEABLE PROJECTS

A list of the existing and reasonably foreseeable cumulative projects is provided in Table 5.8.3.1-1, *List of Cumulative Projects within the Vicinity of the Proposed Project / Proposed Action for the Analysis of Cumulative Impacts to Hydrology and Water Quality*. Cumulative projects are mapped in Figure 5.03-1, *Cumulative Projects in the Vicinity of the Proposed Project / Proposed Action*. These projects include proposed or approved projects within the Owen's Valley that have a potential to contribute to regional impacts when considered in conjunction with the proposed project / proposed action. These projects have either undergone independent environmental review pursuant to NEPA and/or CEQA or will do so prior to consideration for approval by the respective decision-making body. Even if environmental review has not been completed for the projects described in Table 5.8.3.1-1, their potential effects were considered in the cumulative impacts analyses in this EIS/EIR for the geographic area described above. These projects are in various stages of entitlement, permitting, or construction.

[1] USDA National Resources Conservation Services, Available at:
http://cfpub1.epa.gov/surf/huc.cfm?huc_code=18090103

TABLE 5.8.3.1-1
LIST OF CUMULATIVE PROJECTS WITHIN THE VICINITY OF THE PROPOSED PROJECT / PROPOSED ACTION FOR THE ANALYSIS OF CUMULATIVE IMPACTS TO HYDROLOGY AND WATER QUALITY

Project Name	Distance from Project Site	Included in Cumulative Analysis?	Level of Impact to Hydrology and Water Quality
Owens Lake Dust Control Program	Less than 1 mile from the proposed project / proposed action site	Yes	This project involves the construction, operation, and maintenance of Dust Control Measures over approximately 45 square miles of the 110-square mile bed of Owens Lake. The Owens Lake dust control project has the potential to result in impacts to hydrology and water quality. Implementation of mitigation measures would be expected to reduce these impacts to surface water and groundwater quality and levels to below the level of significance.
Lower Owens River Project	Approximately 2 miles west of the proposed project / proposed action site	Yes	The project involved large-scale habitat restoration of the Owens River north of Owens Lake. Possible impacts to hydrology include localized overbank flooding. A mitigation measure was developed to reduce the impact to a less than significant level. Implementation of the Lower Owens River Project is also expected to cause significant and unavoidable impacts to water quality.
Owens Lake Master Project	Less than 1 mile from the proposed project / proposed action site	No	The Owens Lake Master Project involves the development of framework for the management of resources at Owens Lake. As a planning document, the Master Project does not specifically authorize or result in the ability to create impervious surfaces within the watershed, or change surface water drainages.
Owens Lake Groundwater Evaluation Program	Less than 1 mile from the proposed project / proposed action site	No	The LADWP is evaluating Owens Lake groundwater for supplying water to a portion of the dust control activities. Additional study has been recommended to identify the impacts to hydrology and water quality.
Crystal Geyser Roxane Cabin Bar Ranch Water Bottling Facility	Approximately 16 miles southwest of the proposed project / proposed action site	Yes	The Crystal Geyser project involves the construction of a spring water bottling facility and ancillary facilities. The water source for this project is located on the east-facing slopes of the Sierra Nevada. The implementation of this project was determined to result in less than significant impacts to groundwater or surface water hydrology and no mitigation measures were required.
U.S. Borax, Owens Lake Expansion Project	Approximately 10 miles southwest of the proposed project / proposed action site	No	The US Borax project involves the development of a trona ore processing facility at Owens Lake. The facility would consist of portable and mobile washing equipment located on the lake bed and a calcining and drying unit on the western shore and would be subject to obtaining a Notice of Applicability of Waste Discharge Requirement (WDR) permit. The WDR permit requires that there be no alteration of surface water resources in term of quality or quantity where the water discharges at the project boundary; therefore, this project is not expected to contribute to cumulative impacts related to surface or groundwater quality or quantity.

TABLE 5.8.3.1-1
LIST OF CUMULATIVE PROJECTS WITHIN THE VICINITY OF THE PROPOSED PROJECT / PROPOSED ACTION FOR THE ANALYSIS OF CUMULATIVE IMPACTS TO HYDROLOGY AND WATER QUALITY, *CONTINUED*

Project Name	Distance from Project Site	Included in Cumulative Analysis?	Level of Impact to Hydrology and Water Quality
LADWP Southern Owens Valley Solar Ranch Project	Approximately 12 miles north of the proposed project / proposed action site	No	The LADWP solar ranch project involves the development of a 200-megawatt solar facility on 1,600 acres in the lower Owens River Valley and would be subject to obtaining a Notice of Applicability of WDR permit. The WDR permit requires that there be no alteration of surface water resources in term of quality or quantity where the water discharges at the project boundary; therefore, this project is not expected to contribute to cumulative impacts related to surface or groundwater quality or quantity.
Desert Renewable Energy Conservation Plan	Plan Area covers about 22,587,000 acres, including proposed project / proposed action site	No	The Desert Renewable Energy Conservation Plan (DRECP) is intended to conserve threatened and endangered species and natural communities in the Mojave and Colorado Desert regions of Southern California. As a planning document, the Conservation Plan does not specifically authorize or result in the ability to create impervious surfaces within the watershed, change surface water drainages, or allow the extraction of groundwater.
Caltrans Highway 395 Olancha/Cartago Four-Lane Project	Approximately 15 miles west of the proposed project / proposed action site	Yes	The Olancha/Cartago Four-Lane project involves the widening of the existing Caltrans Highway 395 between Olancha and Cartago. Adherence to proper and accepted engineering practices and best management practices is expected to result in less than significant impacts to hydrology and water quality.
Northland Power Independence, LLC Solar Project	Approximately 5 miles east of Independence, CA	No	The 1,280-acre project involves the development of a 200-megawatt solar facility in the southern Owens Valley and would be subject to obtaining a Notice of Applicability of WDR permit. The WDR permit requires that there be no alteration of surface water resources in term of quality or quantity where the water discharges at the project boundary; therefore, this project is not expected to contribute to cumulative impacts related to surface or groundwater quality or quantity.

5.8.4 CUMULATIVE HYDROLOGY AND WATER QUALITY IMPACTS

In consideration of the related past, present, or reasonably foreseeable, probable future projects as listed in Table 5.8.3.1-1, the incremental impact of the combined components of the proposed project / proposed action would not lead to a significant impact to hydrology and water quality. The potential impacts of the proposed project can be evaluated within the context of the cumulative impacts of all ongoing and proposed development.

The proposed project / proposed action was considered in relation to four projects—the Owens Lake Dust Control Program, Lower Owens River Project, Crystal Geyser Roxanne Cabin Bar Ranch Water Bottling Facility, and the Caltrans Highway 395 Olancha/Cartago Four-Lane. No significant hydrology and water quality impacts were identified for these two latter projects. Although impacts were expected to occur with the implementation of the Owens Lake Dust Control Program, the incorporation of mitigation measures would reduce these impacts to below the level of significance. Finally, significant and unavoidable impacts to water quality are associated with the Lower Owens River Project. Given that the proposed project / proposed action is not expected to impact hydrology and water quality, its implementation would not contribute to cumulative hydrology and water quality impacts associated with the Lower Owens River Project.

5.9 LAND USE AND PLANNING

A cumulative impact to land use and planning would occur in a situation where the proposed project / proposed action or an alternative, in combination with other cumulative projects, would result in conflicts with applicable plans, policies, or regulations, or result in incompatibilities with surrounding areas. With regard to lands managed by the BLM, a cumulative impact would occur if the proposed project / proposed action or an alternative, in combination with other cumulative projects, would compromise management practices in the Owens Lake area that are intended to protect and prevent damage to historic, cultural, or scenic values through management of activities and uses allowed within this area.

5.9.1 GEOGRAPHIC SCOPE

The geographic scope for the analysis of cumulative impacts related to land use is the area within the vicinity of Owen Lake. This distance was determined based on capturing projects within a reasonable distance of the proposed project / proposed action site. These additional projects extend approximately 50 miles north, 12 miles west, and 25 miles south from the proposed project / proposed action. Cumulative impacts could result from conflict with any applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating environmental impacts. Therefore, this analysis includes dust control and solar energy projects in Inyo County that may incur similar impacts to existing on-site land uses and surrounding areas, and would have to undergo a similar consistency analysis for plans, policies, and regulations as the proposed project / proposed action.

5.9.2 TIMEFRAME

The timeframe refers to the duration over which impacts associated with land use and planning would occur: short-term or long-term. Short-term impacts to land use and planning would occur during the construction period. Long-term impacts would occur as a result of developing dust control on the proposed project / proposed action site and the resulting change in land use to accommodate the proposed project / proposed action.

5.9.3 EXISTING CUMULATIVE CONDITIONS

The existing cumulative conditions include past, present, and reasonably foreseeable future projects that could conflict with existing land use patterns or special designations. Past and present projects represent those that have been developed and are currently operational, or projects that are currently under construction and will be operational in the near future (1 to 2 years or less). Reasonably foreseeable projects are those for which an application has been submitted to the appropriate agency, are currently undergoing environmental review, or will be pursuing environmental review in the near future (1 to 2 years or less). Activity must be occurring in order for the project to be reasonably foreseeable. Projects that have started the application or environmental review process but have been stalled over 6 months are not considered reasonably foreseeable.

In consideration of the related past, present, or reasonably foreseeable probable future projects, the incremental impact of the combined components of the proposed project / proposed action would not lead to impacts to land use and planning. The potential impacts of the proposed project / proposed action can be evaluated within the context of the cumulative impacts of all ongoing and proposed development.

These projects have either undergone independent environmental review pursuant to NEPA and/or CEQA or will do so prior to approval. The impacts of these projects were considered in the cumulative impacts analysis even if environmental review has not been completed.

5.9.3.1 PAST, PRESENT, AND REASONABLY FORESEEABLE PROJECTS

Past, present, and reasonably foreseeable projects occurring in the vicinity of the proposed project / proposed action site occur on federal (managed by the BLM), LADWP, and private lands. The Land Use Element of the Inyo County General Plan designates the proposed project / proposed action study area as State and Federal Lands, Natural Resources, and Rural Protection.[1] The proposed project / proposed action is located within the OVPA (Figure 1.2-1, *Study Area Boundary in Relation to Owens Valley Planning Area*). The planning area is situated in the southern end of the Owens Valley; implementation of various DCMs on Owens Lake, adjacent and west of the proposed project / proposed action study area, has been ongoing since the year 2001. Cumulative projects identified on Figure 5.03-1, *Cumulative Projects in the Vicinity of the Proposed Project / Proposed Action*, have the potential to combine with proposed project / proposed action or an alternative and result in cumulative impacts to land use.

A list of the existing and reasonably foreseeable cumulative projects is provided in Table 5.9.3.1-1, *List of Cumulative Projects within the Vicinity of the Proposed Project / Proposed Action for the Analysis of Cumulative Impacts to Land Use and Planning*; cumulative projects are mapped in Figure 5.03-1. These projects include proposed or approved projects that have either undergone independent environmental review pursuant to NEPA and/or CEQA or will do so prior to approval. Even if environmental review has not be completed for the projects described in Table 5.9.3.1-1, their potential effects were considered in the cumulative impacts analyses in this EIR/EA for the geographic area described above. These projects are in the various stages of permitting or construction.

TABLE 5.9.3.1-1
LIST OF CUMULATIVE PROJECTS WITHIN THE VICINITY OF THE PROPOSED PROJECT / PROPOSED ACTION FOR THE ANALYSIS OF CUMULATIVE IMPACTS TO LAND USE AND PLANNING

Project Name	Distance from Proposed Project / Proposed Action Site	Included in Cumulative Analysis?	Level of Impact to Land Use and Planning
Owens Lake Dust Control Program	Less than 1 mile from the proposed project / proposed action site	Yes	This project involves the construction, operation, and maintenance of DCMs over approximately 45 square miles of the 110-square-mile bed of Owens Lake. Implementation of the proposed project / proposed action would not result in impacts to land use and planning.
Lower Owens River Project (LORP)	Approximately 2 miles west of the proposed project / proposed action site	Yes	The LORP involves large-scale habitat restoration of the Owens River north of Owens Lake. Implementation of the proposed project / proposed action would not result in impacts to land use and planning associated with the LORP.

[1] Inyo County Planning Department. December 2001. *Inyo County General Plan, Land Use Element.* Independence, CA.

TABLE 5.9.3.1-1
LIST OF CUMULATIVE PROJECTS WITHIN THE VICINITY OF THE PROPOSED PROJECT / PROPOSED ACTION FOR THE ANALYSIS OF CUMULATIVE IMPACTS TO LAND USE AND PLANNING, *CONTINUED*

Project Name	Distance from Proposed Project / Proposed Action Site	Included in Cumulative Analysis?	Level of Impact to Land Use and Planning
Owens Lake Master Project	Less than 1 mile from the proposed project / proposed action site	No	This project involves the development of framework for the management of resources at Owens Lake. Impacts to land use and planning are unknown.
Owens Lake Groundwater Evaluation Program	Less than 1 mile from the proposed project / proposed action site	No.	The LADWP is evaluating Owens Lake groundwater for supplying water to a portion of the dust control activities. Impacts to land use and planning are unknown.
Crystal Geyser Roxane Cabin Bar Ranch Water Bottling Facility	Approximately 16 miles southwest of the proposed project / proposed action site	Yes	This project involves the construction of a spring water bottling facility and ancillary facilities. The proposed project / proposed action would be consistent with the applicable goals and policies of the Inyo County General Plan. There would be no impacts to land use.
U.S. Borax, Owens Lake Expansion Project	Approximately 10 miles southwest of the proposed project / proposed action site	No	The project involves the development of a trona ore processing facility at Owens Lake. The facility would consist of portable and mobile washing equipment located on the lake bed and a calcining and drying unit on the western shore. Impacts to land use and planning are unknown.
LADWP Southern Owens Valley Solar Ranch Project	Approximately 12 miles north of the proposed project / proposed action site	No	The project involves the development of a 200-megawatt solar facility on 1,600 acres in the lower Owens River Valley. The proposed solar ranch project would affect the use of the project property for at least the next 25 years and would need to be evaluated within the context of several land use plans and agreements of which LADWP is a party. The LORP and Owens Valley Land Management Plan establish resource management priorities on lands in the Owens Valley. Project consistency with the management objectives established in these plans would be evaluated in the EIR. Other potential land use effects to be evaluated would include compatibility with nearby uses and consistency with applicable local or regional ordinances or laws affecting solar energy. Depending upon the nature and extent of temporary housing provided by LADWP for the project construction workers, potential effects related to land use compatibility, development standards, planning/zoning issues, and community character would be evaluated. Possible impacts to land use and planning are not known.

TABLE 5.9.3.1-1
LIST OF CUMULATIVE PROJECTS WITHIN THE VICINITY OF THE PROPOSED PROJECT / PROPOSED ACTION FOR THE ANALYSIS OF CUMULATIVE IMPACTS TO LAND USE AND PLANNING, *CONTINUED*

Project Name	Distance from Proposed Project / Proposed Action Site	Included in Cumulative Analysis?	Level of Impact to Land Use and Planning
Desert Renewable Energy Conservation Plan (DRECP)	Plan Area covers about 22,587,000 acres, including proposed project / proposed action site	No	The DRECP is intended to conserve threatened and endangered species and natural communities in the Mojave and Colorado Desert regions of Southern California. Possible impacts to land use and planning are not known.
Caltrans Highway 395 Olancha/Cartago Four-Lane Project	Approximately 15 miles west of the proposed project / proposed action site	Yes	The study involves the widening of the existing Caltrans Highway 395 between Olancha and Cartago. There would be no impacts to land use.
Northland Power Independence, LLC Solar Project	Approximately 5 miles east of Independence, CA	No	The 1,280-acre project involves the development of a 200 megawatt solar facility in the lower Owens River Valley. Possible impacts to land use and planning are not known.

5.9.4 CUMULATIVE LAND USE IMPACTS

The proposed project / proposed action would result in the revegetation of selected areas using biodegradable straw bales and native vegetation and is compatible and consistent with the Bishop RMP and the Land Use Element of the Inyo County General Plan and Inyo County Zoning Ordinance. The Bishop RMP's policies and guidelines applicable to the Owens Lake Management Area address preservation and protection of the environment and archaeological artifacts and management of domestic sources of minerals, off-highway vehicle use, grazing, and recreation on public lands. The Land Use Element of the Inyo County General Plan designates the proposed project / proposed action study area as State and Federal Lands, Rural Protection, and Natural Resources.[2] The Inyo County Zoning Ordinance designates the proposed project / proposed action study area as predominantly an Open Space Zone with 40-acre minimum lot size (OS-40).[3] The OS-40 designation encourages the preservation and protection of mountainous, hilly upland, valley, agricultural, potential agricultural, fragile desert areas, and other mandated lands from fire erosion, soil destruction, pollution, and other detrimental effects of intensive land use activities.[4]

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[2] Inyo County Planning Department. December 2001. *Inyo County General Plan, Land Use Element*. Independence, CA.

[3] Inyo County. 30 June 2003. "Zoning Ordinance," Title 18, Inyo County Code. Independence, CA.

[4] Inyo County. 30 June 2003. "Zoning Ordinance," Title 18, *Inyo County Code*. Independence, CA.

5.10 RECREATION

Cumulative impacts on recreation take into account the proposed project / proposed action's impacts as well as those likely to occur as a result of other existing, proposed, and reasonably foreseeable probable future projects. When analyzing cumulative impacts on recreation, an assessment is made of the impacts on recreation within the cumulative impact analysis area. This cumulative analysis is focused on the proposed project / proposed action's potential contributions to impacts on recreation.

5.10.1 GEOGRAPHIC SCOPE

The cumulative impacts of the proposed project / proposed action on recreation is defined as the incremental physical impact of the proposed project / proposed action when added to other closely related past, present, and reasonably foreseeable probable future projects. The geographic scope of the cumulative effects analysis for recreation includes the local and regional recreation facilities in Inyo County. This geographic scope encompasses an area larger than the proposed project / proposed action site and provides a reasonable context wherein cumulative actions on the proposed project / proposed action site could affect recreation beyond the proposed project / proposed action site.

5.10.2 TIMEFRAME

The timeframe refers the duration over which an impact would occur: short-term or long-term. Short-term impacts to recreation would occur during the construction period. Long-term impacts would occur as a result of any changes in traffic patterns or volumes that would occur as a result of developing dust control on the proposed project / proposed action site and the resulting change in affect access to recreational facilities to accommodate the proposed project / proposed action.

5.10.3 EXISTING CUMULATIVE CONDITIONS

The cumulative conditions include recreation on the federal, state, county, and municipal lands. The proposed project / proposed action is within the Owens Lake Management Area and South Inyo Management Area, two of the nine areas managed by the BLM pursuant to the Bishop Resource Management Plan (RMP). The proposed DCMs would be implemented within the Owens Lake Management Area only. The proposed project / proposed action and alternatives include between 194 and 214 acres of land administered by the BLM where passive recreation is an allowable land use. The Bishop RMP's policies and guidelines applicable to the Owens Lake Management Area address preservation and protection of the environment and archaeological artifacts and management of domestic sources of minerals, off-highway vehicle use, grazing, and recreation on public lands. With regard to recreation within the South Inyo Management Area, the Bishop RMP includes the following policy:

> Manage for primitive recreation opportunities in the proposed Southern Inyo Wilderness Area. Provide for semi-primitive motorized and semi-primitive non-motorized recreation opportunities in the remainder of the area.[1]

[1] U.S. Department of the Interior, Bureau of Land Management, Bakersfield District. 1993. *Bishop Resource Management Plan Record of Decision*. Bakersfield, CA.

There are many federal lands located in the general project vicinity including the Inyo National Forest, Sequoia National Forest, Domeland Wilderness, South Sierra Wilderness, Golden Trout Wilderness, Coso Range Wilderness, Monarch Wilderness, Jennie Lakes Wilderness, Inyo Mountains Wilderness, Sequoia National Park, Kings Canyon National Park, and Death Valley National Park. These surrounding National Forest wilderness areas, National Parks, and National Forest areas provide numerous recreational opportunities including but not limited to hiking, backpacking, horse packing, mountain biking, winter recreation, and off-highway vehicle (OHV) use (see Figure 1.3.1-1, *Regional Vicinity Map*).

Red Rock Canyon State Park, located approximately 75 miles south of the proposed project / proposed action, is the closest recreation area administered by the State of California.

The proposed project / proposed action study area is located within an unincorporated area of Inyo County. Within Inyo County, there are 11 county-run campgrounds and seven county parks, among other recreational areas and facilities.[2] There are 18 public recreational areas within a 1-hour travel time of the proposed project / proposed action. These areas provide access to many types of generally passive recreation. Three of these areas managed by the BLM, nine are managed by Inyo County, two are managed by the National Park Service, and four are managed by the U.S. Forest Service (Table 3.10.2.2-1, *List of Public Recreation Areas within a 1-Hour Travel Time of the Proposed Project / Proposed Action*).

There are no parks of national, state, or historic nature within a 10-mile radius of the proposed project / proposed action study area. There are no designated parks or recreational facilities within the community of Keeler. Seven recreational areas are located within a 15-mile radius of the proposed project / proposed action study area (please refer to Figure 3.10.2.2-1, *Nearest Recreational Facilities to the Proposed Project / Proposed Action Study Area*, and Table 3.10.2.2-1). The nearest recreational areas are:

1. Diaz Recreational Lake Area, located approximately 9 miles northwest of the proposed project / proposed action study area (a 12–20 minute drive)
2. Spainhower Park, located approximately 11 miles northwest of the proposed project / proposed action study area (a 14–17 minute drive)
3. Portagee Joe Campground, located approximately 11 miles northwest of the proposed project / proposed action study area (a 16–19 minute drive)
4. Alabama Hills Recreation Area, located approximately 11 miles northwest of the proposed project / proposed action study area (a 25–31 minute drive)
5. Dirty Socks Hot Springs, located approximately 11.5 miles southwest of the proposed project / proposed action study area (a 17–19 minute drive)
6. Tuttle Creek Campground, located approximately 13 miles northwest of the proposed project / proposed action study area (a 29–34 minute drive)
7. Horseshoe Meadows Road Trailhead, located approximately 13 miles west of the proposed project / proposed action study area (a 52–60 minute drive).

In addition, the Keeler Dunes are located primarily on lands owned and administered by the BLM and where, according to the Bishop RMP, passive recreation is an allowable use. While the general vicinity is known for passive recreation and OHV use, the Bishop RMP states that all BLM lands are to be

[2] Inyo County Department of Parks and Recreation. 2008. *Parks and Recreation*. Available at: http://www.inyocounty.us/campgrounds/index.htm

designated as closed and/or limited to OHV use.[3] The Keeler Dunes are also closed to OHV use. Residents of the community of Keeler use the Keeler Dunes for hiking, dog-walking, and other low-impact recreational activities.[4] In addition, there are historic mining towns and smelter sites in the vicinity (Swansea and Cerro Gordo) that are popular destinations for visitors to the Owens Valley (please refer to Figure 3.10.2.2-2, *Historic Mining Towns and Smelter Sites*).

The proposed project / proposed action study area abuts the eastern shoreline of Owens Lake, which is included in the Owens Lake Master Project. Land on the lake bed and on both sides of the Lower Owens River is being evaluated for opportunities and constraints regarding recreational activities, such as fishing, non-motorized boating, birding and wildlife viewing, swimming and tubing, water fowl hunting, picnicking and camping, hiking/walking, scenic driving and road biking, mountain biking, historical and cultural tourism, and volunteer stewardship and environmental education.

A portion of the proposed project / proposed action is located on lands owned by the LADWP. Recreational usage on LADWP lands is generally light and low-impact. The primary recreational activities that occur on city-owned lands are hunting, fishing, and wildlife viewing. Hunting and fishing are allowed except in areas that are posted. All hunting and fishing activities are under the jurisdiction of the CDFW. Unregulated OHV activity also occurs on the lake, but information regarding the frequency is very limited.

5.10.3.1 PAST, PRESENT AND REASONABLY FORESEEABLE PROJECTS

A list of the existing and reasonably foreseeable cumulative projects is provided in Table 5.10.3.1-1, *List of Cumulative Projects in the Vicinity of the Proposed Project / Proposed Action for the Analysis of Cumulative Impacts to Recreational Resources*; cumulative projects are mapped in Figure 5.03-1, *Cumulative Projects in the Vicinity of the Proposed Project / Proposed Action*. These projects include proposed or approved projects that have either undergone independent environmental review pursuant to NEPA and/or CEQA or will do so prior to approval. Even if environmental review has not be completed for the projects described in Table 5.10.3.1-1, their potential effects were considered in the cumulative impacts analyses in this EIR/EA for the geographic area described above. These projects are in the various stages of permitting or construction.

[3] U.S. Department of the Interior, Bureau of Land Management. April 1993. *Bishop Resource Management Plan, Record of Decision*. Bishop, CA.

[4] Sapphos Environmental, Inc. 12 July 2011. Memorandum for the Record No. 1. Subject: Summary of the June 29, 2011, Project Kickoff Meeting for the Keeler Dunes Environmental Impact Report / Environmental Impact Statement. Pasadena, CA.

TABLE 5.10.3.1-1
LIST OF CUMULATIVE PROJECTS WITHIN THE VICINITY OF THE PROPOSED PROJECT / PROPOSED ACTION FOR THE ANALYSIS OF CUMULATIVE IMPACTS TO RECREATIONAL RESOURCES

Project Name	Distance from Proposed Project / Proposed Action Site	Included in Cumulative Analysis?	Level of Impact to Recreation
Owens Lake Dust Control Program	Less than 1 mile from the proposed project / proposed action site	Yes	This project involves the construction, operation, and maintenance of Dust Control Measures over approximately 45 square miles of the approximately 110-square-mile bed of Owens Lake. Implementation of the proposed project would not result in any adverse impacts to recreational resources.
Lower Owens River Project	Approximately 2 miles west of the proposed project / proposed action site	Yes	The project involved the development of a recreation use plan and large-scale habitat restoration along the Owens River north of Owens Lake. Through the improvement of ecological conditions in the project area, this project would have beneficial effects on recreational uses and opportunities in the southern Owens Valley.
Owens Lake Master Project	Less than 1 mile from the proposed project / proposed action site	Yes	This project involves the development of framework for the management of resources at Owens Lake. Under the Master Plan, new recreational activities would be developed including the construction of hiking trails, viewing areas, and interpretative education.
Owens Lake Groundwater Evaluation Program	Less than 1 mile from the proposed project / proposed action site	No	The LADWP is evaluating Owens Lake groundwater for supplying water to a portion of the dust control activities. Impacts to recreation are unknown.
Crystal Geyser Roxane Cabin Bar Ranch Water Bottling Facility	Approximately 16 miles southwest of the proposed project / proposed action site	Yes	This project involves the construction of a spring water bottling facility and ancillary facilities. The proposed project would be consistent with the applicable goals and policies of the Inyo County General Plan. There would be no impacts to recreation.
U.S. Borax, Owens Lake Expansion Project	Approximately 10 miles southwest of the proposed project / proposed action site	No	The project involves the development of a trona ore processing facility at Owens Lake. The facility would consist of portable and mobile washing equipment located on the lake bed and a calcining and drying unit on the western shore. Impacts to recreational resources are unknown.
LADWP Southern Owens Valley Solar Ranch Project	Approximately 12 miles north of the proposed project / proposed action site	No	The project involves the development of a 200-megawatt solar facility on 1,600 acres in the lower Owens River Valley. It is expected that the temporary workforce associated with the construction phase may increase the demand for recreation facilities, including local and community parks, in the project area. The forthcoming EIR will evaluate changes to existing recreation service and parks that may result from project implementation and will evaluate whether construction of the project could have other effects that could impact area recreation.

TABLE 5.10.3.1-1
LIST OF CUMULATIVE PROJECTS WITHIN THE VICINITY OF THE PROPOSED PROJECT / PROPOSED ACTION FOR THE ANALYSIS OF CUMULATIVE IMPACTS TO RECREATIONAL RESOURCES, *CONTINUED*

Project Name	Distance from Proposed Project / Proposed Action Site	Included in Cumulative Analysis?	Level of Impact to Recreation
Desert Renewable Energy Conservation Plan	Plan Area covers about 22,587,000 acres, including proposed project / proposed action site	No	The Desert Renewable Energy Conservation Plan (DRECP) is intended to conserve threatened and endangered species and natural communities in the Mojave and Colorado Desert regions of Southern California. Possible impacts to recreation are not known.
Caltrans Highway 395 Olancha/Cartago Four-Lane Project	Approximately 7 miles west of the proposed project / proposed action site	Yes	The study involves the widening of the existing Caltrans Highway 395 between Olancha and Cartago. The project is not expected to adversely impact recreational resources.
Northland Power Independence, LLC Solar Project	Approximately 5 miles east of Independence, CA	No	The 1,280-acre project involves the development of a 200 megawatt solar facility in the southern Owens Valley. Possible impacts to recreation are not known.

5.10.4 CUMULATIVE RECREATION IMPACTS

There are 10 cumulative projects within the geographic scope and time frame, excluding the proposed project / proposed action. None of these projects has been determined to have adverse unavoidable environmental effects associated with recreation. Two of these cumulative projects will temporarily affect recreation, but these temporary effects were determined to not be adverse. However, given that most of these cumulative projects are located, in part, on public land, and given that most public land in the region is designated as recreational use, it can reasonably be expected that these 10 cumulative projects could result in temporary impacts on lands accessible for recreation during the construction phase.

5.10.4.1 DIRECT AND INDIRECT IMPACTS

A. Construction

As indicated in the description of the proposed project / proposed action and alternatives, signs directing passive recreation users to areas that are available for such uses during the revegetation efforts would be posted throughout the construction phase of the proposed project / proposed action. The proposed project / proposed action would temporarily limit recreation use on 194 acres of the 750,000 acres of land administered by BLM Bishop Field Office, representing a temporary reduction of less than 0.0003 percent of the land available for passive recreation.[5] The proposed project / proposed action and two cumulative projects would have temporary construction-related impacts on recreation. Neither the proposed project / proposed action nor the cumulative projects would have permanent adverse impacts on recreation. There would be a temporary increase in daytime population during

[5] BLM Bishop Field Office Website. Available at: http://www.blm.gov/ca/st/en/fo/bishop.html

construction and maintenance of the proposed project / proposed action and related projects. Construction workers would be drawn from the existing Owens Valley resident population wherever possible. Residents have existing access to recreation facilities and would not contribute to use levels at federal, state, or county public lands available for recreation. Where necessary, construction crews would be augmented and would most likely be housed temporarily at hotels in the town of Lone Pine. Most of the hotels in the town of Lone Pine have swimming pools and other forms of recreation to entertain guests. There is also sufficient capacity, at county and local recreation facilities within a 1-hour travel time of the town of Lone Pine, to absorb recreation use by construction workers temporarily housed at hotels in Lone Pine during the construction phase of the proposed project / proposed action and related projects As such, the construction phase of the proposed project / proposed action, when combined with the cumulative projects, would not result in a cumulatively considerable impact on recreational activities.

B. Maintenance and Monitoring

As indicated in the description of the proposed project / proposed action and alternatives, signs directing passive recreation users to areas that are available for such uses during the 3-year maintenance and monitoring efforts would be posted throughout the maintenance and monitoring phase of the project. The proposed project / proposed action would temporarily limit recreation use on 194 acres of the 750,000 of acres of land administered by BLM Bishop Field Office, representing a temporary reduction of less than 0.0003 percent of land available for passive recreation. The temporary construction-related impacts would not be present during the maintenance and monitoring phase of the proposed project / proposed action. As such, the maintenance and monitoring phase of the proposed project / proposed action, when combined with the cumulative projects, would not result in a cumulatively considerable impact on recreational activities.

5.10.4.2 CEQA SIGNIFICANCE DETERMINATIONS

There are 10 cumulative projects within the geographic scope; none of the cumulative projects has been determined to have adverse unavoidable environmental effects associated with recreation. The proposed project would not have a cumulative adverse effect on the federal, state, county, or local recreational resources in the region. The recreational lands would remain available for recreational activities that are permitted within their specified use designations. Furthermore, the proposed project does not involve or necessitate the construction of recreation facilities. The proposed project would not contain a residential component that would increase the use of an existing neighborhood park or a regional park or other recreational facilities such that substantial physical deterioration would occur. Implementation of the proposed project would not have a cumulatively considerable impact on recreational resources. All impacts are temporary, and would not obstruct opportunities for recreation for residents of the communities of Keeler or Swansea.

5.10.4.3 NEPA IMPACT ANALYSIS

The location of proposed action components on lands administered by the BLM would be consistent with intended land use designations set forth by BLM's Bishop RMP. The proposed action involves revegetation with plants that are native to and present on other shoreline dune complexes located above the high water line of the historic Owens Lake. Use of these areas is currently closed to OHV use and limited to passive recreation uses such as walking and bird watching and would continue to be suitable for such passive recreation uses when the 3-year maintenance and monitoring phase of the proposed action is completed. The proposed action would adhere to assigned land use designations and consequently would not contribute to cumulative recreation impacts.

5.11 TRAFFIC AND TRANSPORTATION

Cumulative impacts to traffic and transportation could occur if implementation of the proposed project / proposed action would combine with impacts of other local or regional projects. A list of the existing and reasonably foreseeable cumulative projects is provided in Table 5.03-1, *Cumulative Projects in the Vicinity of the Proposed Project / Proposed Action*. Related projects are mapped in Figure 5.03-1, *Cumulative Projects in the Vicinity of the Proposed Project / Proposed Action*.

5.11.1 GEOGRAPHIC SCOPE

The proposed project / proposed action is located immediately northwest of the community of Keeler in Inyo County, California. The proposed project / proposed action consists of194 acres of straw bales and native vegetation planted within a study area of approximately 870 acres. The study area is bounded approximately by the Inyo Mountains on the east-northeast and the Owens Lake bed shoreline on the west-southwest, and extends approximately 2.5 miles to the northwest from the community of Keeler. California State Route 136 bisects the study area. The proposed project / proposed action is located on lands administered by the BLM Bishop Office and the LADWP. Other stakeholders include Inyo County, the local Lone Pine Paiute-Shoshone Tribes, Caltrans District 9, Southern Pacific Railroad, Keeler Community Services District, and Keeler residents.

5.11.2 TIMEFRAME

Installation of the proposed project / proposed action and alternatives would require approximately 11 months to complete. Construction of the proposed project / proposed action and alternatives would be divided into the following parts: (1) temporary access route and staging area(s); (2) bale placement and planting and watering; (3) project oversight and monitoring; and (4) supplemental watering and planting (project operation and maintenance) for a period of 3 years, as required.

Construction would be scheduled in compliance with County of Inyo regulations. Construction employees would be expected to carpool from respective population centers such as Lone Pine, Olancha, or Keeler, California, and report to the designated construction staging area prior to the beginning of each work day. Employees would use SR 136 and the gravel haul road and the Old State Highway for ingress/egress to the proposed project / proposed action property and that, once on site, they would access various sections by foot and ATV along temporary access routes. Workers would be present at the proposed project / proposed action site between 7:00 a.m. and 5:00 p.m., Monday through Friday. During periods of high temperature, work may begin as early as 5:00 a.m.

Up to 72 workers would be expected to be on site during peak construction activity periods. Construction equipment would be turned off when not in use. The construction contractor would be required to ensure that all equipment is properly maintained. All vehicles would utilize exhaust mufflers and engine enclosure covers (as designed by the manufacturer) at all times.

The plans and specifications for the proposed project / proposed action would include the requirement for construction equipment and average number of hours of operation of the type specified in Table 5.11.2-1, *Dust Control Activity, Duration, Equipment, and Workers*. Table 5.11.2-1 lists the duration of each activity and maximum number of workers on the site each day.

TABLE 5.11.2-1
DUST CONTROL ACTIVITY, DURATION, EQUIPMENT, AND WORKERS

Activity	Duration (months)	Equipment	Workers (maximum)
Site preparation	~ 1 week	GrubberAll-terrain vehicle Pickup truck Trailers	10
Deliver and distribute straw bales over the dust control areas and Planting and watering	6 to 8 months	Semi-trucks with tandem trailers Loader with forks Hay Squeeze All-terrain Vehicles Water Trucks	72
Supplemental Watering	1 to 3 months	All-terrain vehicles Water trucks	13
Cleanup/restoration	~ 2 weeks	Semi-trucks with tandem trailers All-terrain vehicles Loader with forks Dozers and trailers Water trucks Pick-up trucks	20

5.11.3 EXISTING CUMULATIVE CONDITIONS

5.11.3.1 PAST, PRESENT AND REASONABLY FORESEEABLE PROJECTS

In addition to coordinating with their internal planning personnel, the District and BLM contacted the State Lands Commission, Inyo County, and the LADWP to seek out information regarding past, present, and reasonably foreseeable probable future projects within the Owens Valley Planning Area. The District and the BLM identified nine past, present, and reasonably foreseeable probable future projects that were considered in the evaluation of the potential for the proposed project / proposed action to result in cumulative significant impacts (Table 5.11.3.1-1, *Past, Present and Reasonably Foreseeable Projects in the Vicinity of the Proposed Project / Proposed Action for the Analysis of Cumulative Impacts to Traffic and Transportation*):

TABLE 5.11.3.1-1
PAST, PRESENT AND REASONABLY FORESEEABLE PROJECTS IN THE VICINITY OF THE PROPOSED PROJECT / PROPOSED ACTION FOR THE ANALYSIS OF CUMULATIVE IMPACTS TO TRAFFIC AND TRANSPORTATION

Project Name	Distance from Project Site	Included in Cumulative Analysis	Level of Impact to Traffic and Transportation
Owens Lake Dust Control Program	Located approximately less than 1 mile from the proposed project / proposed action location.	Yes. Owens Lake Dust Control Program is within the 2.5-mile radius. Construction of the Phase 7a project will occur during the same time period as the dust control construction in the Keeler Dunes	The Owens Lake Dust Control Program is not anticipated to cumulatively contribute to transportation and traffic impacts.
Caltrans Highway 395 Olancha/Cartago Four-Lane Project	Located approximately 15 miles southwest from the southwest corner of the proposed project / proposed action location.	No. The Caltrans Highway 395 Olancha/Cartago Four-Lane Project is neither within the 2.5-mile radius nor is it expected to be under construction simultaneously with the proposed project / proposed action.	The Caltrans Highway 395 Olancha/Cartago Four-Lane Project is not anticipated to cumulatively contribute to transportation and traffic impacts based on its location and timing. In addition, all projects are anticipated to implement air quality mitigation measures to reduce adverse impacts.
Crystal Geyser Roxane Cabin Bar Ranch Water Bottling Facility	Located approximately 12.5 miles southwest from the southwest corner of the proposed project / proposed action location.	No. The Crystal Geyser Roxane Cabin Bar Ranch Water Bottling Facility is neither within the 2.5-mile radius nor will the facility be under construction simultaneously with the proposed project / proposed action.	The Crystal Geyser Roxane Cabin Bar Ranch Water Bottling Facility Project is not anticipated to cumulatively contribute to transportation and traffic impacts based on its location and timing.
Owens Lake Master Project	Located within 1 mile of the proposed project / proposed action location.	No. The Owens Lake Master Project is within the 2.5-mile radius but is not expected to be under construction simultaneously with the proposed project / proposed action.	The Owens Lake Master Project is not anticipated to cumulatively contribute to transportation and traffic impacts based on its location and timing.
LADWP Southern Owens Valley Solar Ranch	Located approximately 15 miles northwest from the northwest corner of the proposed project / proposed action location.	No. The LADWP Southern Owens Valley Solar Ranch is neither within the 2.5-mile radius nor is it expected to be under construction simultaneously with the proposed project / proposed action.	The LADWP Southern Owens Valley Solar Ranch is not anticipated to cumulatively contribute to transportation and traffic impacts based on its location and timing.

TABLE 5.11.3.1-1
PAST, PRESENT AND REASONABLY FORESEEABLE PROJECTS IN THE VICINITY OF THE PROPOSED PROJECT / PROPOSED ACTION FOR THE ANALYSIS OF CUMULATIVE IMPACTS TO TRAFFIC AND TRANSPORTATION, *CONTINUED*

Project Name	Distance from Project Site	Included in Cumulative Analysis	Level of Impact to Traffic and Transportation
Owens Lake Groundwater Evaluation Program	Located within 1 mile of the proposed project / proposed action location.	No. The Owens Lake Groundwater Evaluation Program is within the 2.5-mile radius but is not expected to result in transportation and traffic impacts.	The Owens Lake Groundwater Evaluation Program is not anticipated to cumulatively contribute to transportation and traffic impacts based on its location and nature of the project.
U.S. Borax Owens Lake Expansion Project	Located approximately 10.0 miles southwest of the southwestern corner of the proposed project / proposed action location.	No. The U.S. Borax Owens Lake Expansion Project is not within the 2.5-mile radius of the proposed project / proposed action.	The U.S. Borax Owens Lake Expansion Project is not anticipated to cumulatively contribute to transportation and traffic impacts based on its location.
Desert Renewable Energy Conservation Plan (DRECP)	The DRECP spans approximately 22,587,000 acres throughout Southern California's deserts. The proposed project / proposed action is located entirely within the DRECP, and shares its northeastern boundary with a small portion of the DRECP eastern boundary.	Yes. The DRECP is within the 2.5-mile radius; however, the nature of the project does not generate transportation and traffic impacts.	The DRECP is not anticipated to cumulatively contribute to transportation and traffic impacts based on the nature of the project.
Lower Owens River Project	The southeastern corner of the Lower Owens River Project is located approximately 2.25 miles northwest from the northwestern corner of the proposed project / proposed action location.	Yes. The Lower Owens River Project is within the 2.5-mile radius; however, the nature of the project does not generate transportation and traffic impacts.	The Lower Owens River Project is not anticipated to cumulatively contribute to transportation and traffic impacts based on the nature of the project.

5.11.3.2 EXISTING TRAFFIC VOLUMES

Recent traffic counts for U.S. Highway 395, SR 136, and SR 190 in the proposed project / proposed action vicinity were researched from data provided in *2011 Traffic Volumes on California State Highway System*, which was published by Caltrans in August 2012.[1] The Caltrans publication lists 2011 traffic volumes for all count locations on the California state highway system. Peak hours, peak month average daily traffic (ADT) volumes, and annual ADT (AADT) volumes are shown for each

[1] California Department of Transportation. August 2012. *2011 Traffic Volumes on California State Highway System*. Sacramento, CA.

count location in the publication. Significant volume changes (breakpoints) in the traffic profile along each route are counted and identified by name and milepost value. The existing traffic volumes for U.S. 395, SR 136, and SR 190 are shown in Figure 3.11.2.2-1, *Existing Year 2011 Annual ADT Volumes*.

The AADT is the total traffic volume for the year divided by 365 days. The traffic count year data are collected from October 1 through September 30. Very few locations in California are actually counted continuously. Traffic counting is generally performed by electronic counting instruments moved from location to location throughout the state in a program of continuous traffic count sampling. The resulting counts are adjusted to an estimate of annual average daily traffic by compensating for seasonal influence, weekly variation, and other variables that may be present. AADT is necessary for presenting a statewide picture of traffic flow, evaluating traffic trends, computing accident rates, planning and designing highways, and other purposes.

U.S. Highway 395 Traffic Volumes

The AADT volume on U.S. Highway 395 between SR 136 and SR 190 varies between 5,450 and 5,860 vehicles per day, respectively, with a peak hour traffic volume of approximately 1,100 vehicles (year 2011 traffic volumes adjusted to reflect year 2012 conditions). This AADT volume is well below the capacity of the four-lane section of the highway, extending between SR 136 and SR 190.

State Route 136 Traffic Volumes

The AADT along SR 136 ranges from approximately 545 vehicles east of U.S. Highway 395 to approximately 435 vehicles near SR 190 at the Olancha cutoff (year 2011 traffic volumes adjusted to reflect year 2012 conditions). The peak hour traffic volume at both of these locations is approximately 70 vehicles per hour. The current traffic volume data indicate that this route is currently operating well below capacity.

State Route 190 Traffic Volumes

The AADT volume along SR 190 ranges from approximately 230 vehicles both east of U.S. Highway 395 and west of SR 136 (year 2011 traffic volumes adjusted to reflect year 2012 conditions). The peak hour traffic volume at both of these locations is approximately 50 vehicles per hour. The current traffic volume data indicate that this route is currently operating well below capacity.

5.11.4 CUMULATIVE TRAFFIC AND TRANSPORTATION IMPACTS

In consideration of the related past, present, or reasonably foreseeable, probable future projects, the incremental impact of the combined components of the proposed project / proposed action would not lead to a significant impact to traffic and transportation. The potential impacts of the proposed project / proposed action can be evaluated within the context of the cumulative impacts of all ongoing and proposed development.

The proposed project / proposed action, in consideration with the Owens Lake Dust Control Program, the Owens Lake Master Project, the Lower Owens River Project, and the Owens Lake Groundwater Evaluation Program, would not create considerable cumulative impacts to traffic and transportation because the proposed project / proposed action would not result in any impacts to traffic and traffic.

Four projects, the Crystal Geyser Roxanne Cabin Bar Ranch Water Bottling Facility; U.S. Borax, Owens Lake Expansion Project/Conditional Use Permit #02-13/Reclamation Plant #02-1; LADWP Southern

Owens Valley Solar Ranch Project; and Desert Renewable Energy Conservation Plan, would not result in impacts to traffic and transportation, because potential impacts from these projects would be reduced below the level of significance with the incorporation of mitigation measures. In addition, these projects are not anticipated to occur while the proposed project / proposed action is being constructed. The Caltrans Highway 395 Olancha/Cartago Four-Lane Project is a transportation improvement project and, therefore, would not result in impacts related to traffic and transportation. Therefore, the impacts to traffic and transportation resulting from implementation of the proposed project / proposed action would not be significant when viewed in connection with the related impacts of other current projects.

CHAPTER 6.0
OTHER CEQA REQUIRED CONSIDERATIONS

6.0 OTHER CEQA REQUIRED CONSIDERATIONS

CEQA requires the discussion of significant irreversible environmental changes, growth-inducing impacts, and areas of unavoidable significant environmental impacts for the proposed project / proposed action and alternatives. This section of the EIR/EA addresses these issues as they relate to the development of the proposed project / proposed action.

6.1 PROPOSED PROJECT

6.1.1 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

6.1.1.1 CEQA

As required pursuant to Section 15126.2(c) of the State CEQA Guidelines, this section of the EIR/EA summarizes the potential for implementation of the proposed project to result in significant irreversible environmental changes. Such a change refers to an irretrievable commitment of nonrenewable resources, or other environmental changes that commit future generations to similar uses. Irreversible environmental changes can also result from potential accidents associated with the proposed project.

The implementation of the DCMs would not result in significant irreversible changes to the existing environmental conditions in the proposed project area. The analysis performed in Section 4 determined that the proposed project would not result in significant irreversible environmental changes that would commit future generations to similar uses. The use of resources is confined to limited amounts of gasoline and diesel fuel to support transportation of personnel and equipment to the site, as well as water to support irrigation during the initial phases of the project installation. The anticipated consumptive use of gasoline, diesel fuel, and water is consistent with regional levels of supply and demand. The District has determined that the water can be provided by existing groundwater wells that would not create or exacerbate groundwater drawdown. Therefore, the proposed project would not be expected to create the need for development of new sources of gasoline, diesel fuel, or water.

In exchange for the limited use of gasoline, diesel fuel, and water, the proposed project would reduce PM_{10} emissions consistent with the 24-hour standard pursuant to NAAQS and State AAQS, providing clean and healthful air for local residents and visitors and related improvements to visibility on the local and regional transportation corridors in the vicinity of the community of Keeler, as well as reducing the degeneration of environmentally sensitive areas.

6.1.1.2 NEPA

NEPA requires an analysis of the significant irreversible effects of a proposed action. Resources irreversibly or irretrievably committed to a proposed action are those used on a long-term or permanent basis. This includes the use of nonrenewable resources such as metal, wood, fuel, paper, and other natural resources. These resources are considered nonretrievable in that they would be used for a proposed action when they could have been conserved or used for other purposes. Another impact that falls under the category of irreversible and irretrievable commitment of resources is the unavoidable destruction of natural resources.

The use of fuel and water for the proposed action is limited in duration, during the initial phase of project installation, and would not constitute an irretrievable commitment of resources pursuant to NEPA. The permanent installation is limited to biodegradable straw bales and native plants. Over its operational life, the proposed action would contribute to a reduction in PM_{10} emissions, consistent with the 24-hour standard for the NAAQS and the State AAQS, improved visibility on local and regional transportation systems in the vicinity of the community of Keeler, and improved conservation of environmentally sensitive resources.

6.1.2 GROWTH-INDUCING IMPACTS

6.1.2.1 CEQA

A project is considered growth-inducing if it can foster economic or population growth or the construction of additional housing, either directly or indirectly, in the surrounding environment (CEQA Guidelines §15126.2(d)). This definition includes projects that would remove obstacles to population growth, such as extending public services into areas not previously served. Growth inducement can also be defined as an action that would encourage an increase in density of development in surrounding areas or encourage adjacent development. According to CEQA Guidelines §15126.2(d), growth should not be assumed to be beneficial, detrimental, or of little significance to the environment.

Although the proposed project would provide jobs during the construction period, there is sufficient available labor in the community to support it. Approximately 72 people may be required during construction, and those jobs would be short-term in nature and would last only the duration of project construction. Additional labor may be required once annually, during supplemental watering. The proposed project would rely on existing infrastructure and utilities. The proposed project would not be expected to generate new jobs after the completion of construction for the maintenance and operation of the DCMs. The proposed project would not be expected to result in the construction of additional housing either directly or indirectly. The proposed project does not provide infrastructure such as water systems, energy generation, sewer systems, schools, public services, or transportation improvements that could potentially support increased growth in the region. The surrounding region is open space and undeveloped. The temporary routes constructed to access the project site would be revegetated following the completion of the initial installation phase of the project. The proposed project would provide a beneficial effect on the air quality of the community of Keeler and the region as a result of the reduction of PM_{10} emissions.

6.1.2.2 NEPA

Under NEPA, indirect effects including growth-inducing effects must be analyzed (40 CFR Section 1508.8(b)). Issuance of the right-of-way permit would allow implementation of the DCMs. There is sufficient labor supply available to support up to 72 laborers required for the initial installation of the project. Additionally, the project would not involve the development of any new roadways, new water systems, or new sewer systems. Potable water supply would be provided from bottled water. Portable toilet facilities will be used during the initial phase of the installation. Therefore, there would be no infrastructure improvements that would be available to serve the surrounding areas. For these reasons, the proposed action would not be growth-inducing. The temporary road constructed to access the proposed action site would be revegetated following the completion of the initial installation phase of the proposed action.

6.1.3 UNAVOIDABLE SIGNIFICANT ENVIRONMENTAL IMPACTS

Analysis of environmental impacts caused by the proposed project / proposed action has been completed and is included in Chapter 4 of this EIR/EA. Consistent with the requirements of Section 15126.2(b) of the State CEQA Guidelines, significant impacts, including those that can be mitigated but not reduced to the level below significance, are described in this section of the EIR/EA. Where there are impacts that cannot be alleviated without imposing an alternative design, their implications and the reasons why the project is being proposed, notwithstanding their effect, are also described.

In coordination with BLM, the District incorporated into the project description a range of Best Management Practices, including measures to avoid impacts to biological, cultural, and paleontological resources, and traffic control measures to be employed during the installation phase of the proposed project / proposed action. No unavoidable significant environmental impacts were identified for the proposed project / proposed action or any of the five analyzed project/action alternatives. No development is proposed under Alternative 6, No Project / No Action Alternative. In the No Project / No Action scenario, exceedances of the 24-hour NAAQS and State AAQS would remain significant and unavoidable.

CHAPTER 7.0
EFFECTS FOUND NOT TO BE SIGNIFICANT

7.0 EFFECTS FOUND NOT TO BE SIGNIFICANT FOR CEQA

CEQA Guidelines §15128 requires that an EIR contain a brief statement disclosing the reasons why various possible significant effects of the proposed project or analyzed alternatives were found not to be significant and, therefore, would not be discussed in detail in the EIR. The environmental issues not expected to have a significant impact as a result of the proposed project / proposed action or Alternatives 1 through 5 were scoped out. These are described in detail in Chapter 1, *Introduction*, subsection 1.13, and are briefly summarized in this section. The District reviewed previous Initial Studies and EIRs prepared for dust control activities at Owens Lake,[1,2,3] analyzed a variety of potential DCMs applicable to the proposed project study area, and conducted public information meetings to disseminate information regarding ongoing research about potential DCMs under consideration for the proposed project to assist in defining the scope of the environmental evaluation.[4,5]

The analysis provided in Sections 4.1 through 4.11 identified no adverse impacts for the proposed project and Alternatives 1 through 5.

Alternative 6, the No Project Alternative, would not involve any construction on the proposed project site. Therefore, no effects on any of the resource and issue areas were identified.

AESTHETICS / VISUAL RESOURCES

As documented in Section 4.1, the proposed project site is not near any scenic vista or scenic highway; nor does it appear that it would damage or degrade any existing scenic resources. The proposed project would be consistent with the visual character of the proposed project site and not produce a significant source of light or glare. Thus, no impact is identified for this issue area.

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[1] Great Basin Unified Air Pollution Control District. January 2008. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan—Integrated Subsequent Environmental Impact Report*. State Clearinghouse Number 2007021127. Prepared by Sapphos Environmental, Inc. Pasadena, CA.

[2] Great Basin Unified Air Pollution Control District. February 2004. *2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Integrated Environmental Impact Report*. State Clearinghouse House No. 2002111020. Prepared by: Sapphos Environmental, Inc., Pasadena, CA. Bishop, CA.

[3] Great Basin Unified Air Pollution Control District. February 2007. *2008 Owens Valley PM10 Planning Area Demonstration of Attainment State Implementation Plan Initial Study*. State Clearinghouse Number 2007021127. Bishop, CA.

[4] Great Basin Unified Air Pollution Control District. 2011. *Preliminary Constraints Analysis*. Prepared by: Sapphos Environmental, Inc., Pasadena, CA. Bishop, CA.

[5] Great Basin Unified Air Pollution Control District. 2011. "Public Meeting Presentation Materials for January 20, 2010 and August 24, 2011 Public Meetings." Available at: http://www.gbuapcd.org/keelerdunes/reports/index.htm

AGRICULTURE AND FORESTRY RESOURCES

The proposed project area consists of a sand sheet and active sand dunes. The Bishop RMP does not designate any areas of Inyo County as prime or unique agricultural or farmlands.[6] Similarly, the California Department of Conservation's FMMP has not mapped Inyo County as part of the FMMP.[7] There would be no conversion of designated or potential prime or unique farmland that would occur as part of the proposed project. Therefore, this issue area was not carried forward for detailed evaluation in the EIR.

There are no existing forest lands, timberlands, timberland zones, or timberland production either on-site or in the immediate vicinity that would conflict with existing zoning or cause rezoning. There are no existing forest lands either on-site or in the immediate vicinity of the site. The proposed project would not result in the loss of forest land or conversion of forest land to non-forest use. Therefore, this issue area was not carried forward for detailed evaluation in the EIR.

AIR QUALITY

As documented in Section 4.2, the proposed project would be consistent with the 2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment SIP and required to meet the objectives of that plan. As such, implementation and monitoring of the plan would not violate any air quality standard or contribute substantially to an existing or projected air quality violation. The proposed project facilitates attainment of the 24-hour standard for PM_{10} pursuant to the Federal NAAQS and the State AAQS and would not result in an increase or contribute to an increase in any criteria pollutant. The proposed project protects sensitive receptors from the harmful effects of PM_{10} and would not expose sensitive receptors to substantial pollutant concentrations or objectionable odors.

BIOLOGICAL RESOURCES

As documented in Section 4.3, the proposed project would result in a net increase in native vegetation; therefore, there is no anticipated substantial adverse effect directly or indirectly through habitat modification on any special status species of plant or wildlife, riparian habitat, designated sensitive habitat, or the movement of native or migratory fish or wildlife. The proposed project does not include work in any federally protected wetland as defined by Section 404 of the CWA or any stream or lake bed afforded protection pursuant to Section 1600 of the State Fish and Game Code. The proposed project would not conflict with the provisions of an adopted or proposed Habitat Conservation Plan; Natural Community Conservation Plan; or any other federal, state, or local conservation plan.

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[6] Bureau of Land Management, Bakersfield District. April 1993. *Bishop Resource Management Plan Record of Decision*. Bakersfield, CA.

[7] California Department of Conservation, Division of Land Resource Protection, Farmland Mapping and Monitoring Program. Accessed 3 October 2012. Available at: http://www.conservation.ca.gov/DLRP/fmmp/Pages/Index.aspx

CULTURAL RESOURCES

As documented in Section 4.4, the proposed project area has been surveyed for cultural resources. The proposed project has been designed in a manner that would not result in an adverse change to the significance of historical or archeological resources or directly or indirectly affect a paleontological resource, or disturb human remains, including those interred outside of formal cemeteries.

GEOLOGY AND SOILS

As documented in Section 4.5, the proposed project does not involve the construction or alteration of structures; therefore, the proposed project would not expose people or structures to potential substantial adverse effects. As the proposed project is limited to the installation of straw bales and vegetation with native plants, the proposed project would not affect soil stability, or contribute to landslides, lateral spreading, subsidence, liquefaction, or collapse. Portable toilet facilities will be used during the installation of the proposed project; therefore, there is no requirement of a septic system or a wastewater disposal system.

PALEONTOLOGY

As documented in Section 4.6, the proposed project area has been surveyed for paleontological resources. The proposed project has been designed in a manner that would not directly or indirectly affect a paleontological resource.

GREENHOUSE GAS EMISSIONS AND GLOBAL CLIMATE CHANGE

As documented in Section 4.7, the proposed project is limited to the installation of straw bales and vegetation with native plants that would not generate, directly or indirectly, greenhouse gas emissions that would have a significant impact on the environment or conflict with adopted plans related to the reduction of greenhouse gases.

HAZARDS AND HAZARDOUS MATERIALS

There are no hazards or hazardous materials sites occurring within the proposed project area; therefore, the proposed project would not expose people or property to negative impacts related to hazards or hazardous materials. The review of a federal, state, local, and tribal environmental regulatory database compilation, aerial photographs, and cultural resource data did not identify any locations within the proposed project area that have been effected by hazardous or solid waste materials. The former permitted solid waste disposal site known as the Keeler Landfill or disposal site was located 1/8th mile southeast of the proposed project area and would not pose a threat to the people, equipment, or plants that will be installed on 194 acres in conjunction with the proposed project.

The proposed project does not involve the use or storage of hazardous materials, other than fuel and oil used in proposed project vehicles and equipment during proposed project construction. The proposed project would not generate any hazardous or solid waste. The construction of DCMs could result in the routine transport, use, or disposal of potentially hazardous materials, such as vehicle fuels, oils, and transmission fluids. Operational impacts are not anticipated to require these substances. During construction, all hazardous materials would be contained, stored, and used in accordance with manufacturers' instructions and handled in compliance with applicable federal, state, and local standards and regulations including preparation of a SPCC program, as specified in the proposed project description, and therefore, no significant impact would occur.

Refueling activities may be conducted on-site during constructing and could result in a spill of gasoline or diesel to the ground surface, contaminating soils and possibly water quality, if contamination were to be transported off-site during a rain event. The SPCC program would minimize any impacts from the unexpected and accidental release of hazardous substances at the proposed project site by providing procedures for refueling activities and standard maintenance of construction equipment.

The proposed project is not located on the Comprehensive Environmental Response, Compensation, and Liability Information System list (CERCLIS) of potential Superfund sites identified by the U.S. EPA and is not on the California EPA Leaking Underground Storage Tank Information System list (LUSTIS). The proposed project is not located within one-quarter mile of a school or near an airport or airport planning area. The proposed project would not contribute to risk of a wildland fire as no structures would be developed. The proposed project and alternatives would be subject to compliance with applicable federal, state, and local standards and regulations that regulate the use, storage, and disposal of hazardous substances including preparation of an SPCC program. Therefore, no significant impact would occur due to hazards and hazardous materials, and the issue area was not carried forward for detailed evaluation in the EIR.

HYDROLOGY AND WATER QUALITY

As documented in Section 4.8, the proposed project does not suggest the placement of housing or structures within a 100-year flood hazard area. Thus, no impact is identified for these issue areas.

No bays or lakes, other than the dry bed of Owens Lake, are within a 2-mile radius of the proposed project site, and the proposed project site is over 100 miles from the Pacific Ocean. In addition, the proposed project site is relatively flat and level. Therefore, there is no potential for the proposed project site to be inundated by seiches, tsunamis, or mudflows. Thus, no impact is identified for this issue.

LAND USE AND PLANNING

As documented in Section 4.9, the vegetation of selected areas using biodegradable straw bales and native shrubs is compatible and consistent with the Bishop RMP and the Land Use Element of the Inyo County General Plan and Inyo County Zoning Ordinance. The Bishop RMP's policies and guidelines applicable to the Owens Lake Management Area address preservation and protection of the environment and archaeological artifacts and management of domestic sources of minerals, off-highway vehicle use, grazing, and recreation on public lands. The Land Use Element of the Inyo County General Plan designates the proposed project study area as State and Federal Lands, Rural Protection, and Natural Resources.[8] The Inyo County Zoning Ordinance designates the proposed project study area as predominantly an Open Space Zone with 40-acre minimum lot size (OS-40).[9] The OS-40 designation encourages the preservation and protection of mountainous, hilly upland, valley, agricultural, potential agricultural, fragile desert areas, and other mandated lands from fire erosion, soil destruction, pollution, and other detrimental effects of intensive land use activities.[10]

MINERAL RESOURCES

There are no mineral leases within the proposed project study area. Therefore, there would be no loss of a known mineral resource that would be a future value to the region. The proposed project is designated OS-40. In addition, the proposed project is known to have important cultural significance for Native American tribes of the region. Therefore, the proposed project would not lead to a significant impact to a known mineral resource of local or regional importance.

NOISE

The proposed project is a DCM that would entail temporary and permanent measures to control dust that include straw bales and native vegetation. There are no structures or commercial establishments associated with the proposed project. The proposed project study area is currently periodically monitored by District and BLM staff, and only occasional vehicular traffic occurs at the proposed project site. However, the construction phase of the proposed project is anticipated to require up to 11 months. During this time period, workers and delivery vehicles, ATVs, and other equipment will be operating on-site. During the 3-year operations and maintenance phase, water delivery trucks and ATVs will be temporarily on-site for 2–6 months per year providing supplemental water for plant establishment. However, noise impacts to residents are not expected to be significant because all site access would occur approximately 0.4 mile from the nearest residence and construction work would be required to comply with Inyo County codes and ordinances. Therefore, this issue area was not carried forward for detailed evaluation in the EIR.

POPULATION AND HOUSING

Implementation of the proposed project does not involve development of new residences and would not generate a direct increase in the permanent population of the area. During proposed project construction, employees are expected to be local workers from surrounding communities, and a significant population increase is not anticipated. The proposed project would not affect the existing supply or demand for permanent housing or on available rental housing in the community of Keeler or surrounding communities. Therefore, impacts to population and housing associated with the proposed project would be less than significant, and this issue area was not carried forward for detailed evaluation in the EIR.

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[8] Inyo County Planning Department. December 2001. *Inyo County General Plan, Land Use Element*. Independence, CA.

[9] Inyo County. 30 June 2003. "Zoning Ordinance," Title 18, *Inyo County Code*. Independence, CA.

[10] Inyo County. 30 June 2003. "Zoning Ordinance," Title 18, *Inyo County Code*. Independence, CA.

PUBLIC SERVICES

The proposed project is a DCM and would not entail the construction of housing, commercial space, or other developments that would cause an impact on public services such as fire protection, police enforcement, schools, parks, solid waste, or other services. Construction workers are anticipated to be supplied from surrounding communities and would cause only a temporary increase in the daytime population of the community of Keeler. Periodic maintenance and monitoring of the proposed project would not create a substantial increase in population to the area. Therefore, there would be no significant impacts to existing public services of the area, and this issue area was not carried forward for detailed evaluation in the EIR.

RECREATION

As documented in Section 4.10, the proposed project is an uninhabited DCM, consisting of the installation and monitoring of straw bales and native vegetation and would not create a demand for recreation or parks in the County. Thus, no impact is identified for recreation as it relates to existing neighborhood and regional parks or the construction or expansion of recreational facilities. Recreation, as it relates to affecting access to recreational facilities located on BLM land, is discussed in Sections 3.10 and 4.10.

TRANSPORTATION AND TRAFFIC

As documented in Section 4.11, the proposed project would not result in changes to existing air traffic patterns through a decrease in traffic level of service or change in location. Thus, no impact is identified for this issue area.

The proposed project would not conflict with any adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities. Thus, no impact is identified for this issue area.

UTILITIES AND SERVICE SYSTEM

The proposed project would not result in the need for new water, wastewater, or solid waste disposal facilities. There are no buildings or other structures that would require water, power, or wastewater services. Construction and operation of the proposed project would require water for a period of 3 years to be applied annually to native vegetation planted at the site. This is a discrete temporary water demand and there are several potential water sources in the proposed project study area that could provide the necessary water supply. The proposed project is designed to require minimal resources for maintenance. Therefore, the proposed project is not anticipated to create significant impacts on utilities and service systems, and this issue area was not carried forward for detailed evaluation in the EIR.

CHAPTER 8.0
CONSULTATION AND COORDINATION

8.0 CONSULTATION AND COORDINATION

8.1 EIR/EA PREPARERS

The following individuals contributed to the preparation of this document:

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Donna Grotzinger	Environmental Compliance Specialist	EIR/EA project management and project description, Hydrology and Water Quality
Adam Furman	Environmental Compliance Coordinator	Project description, Air Quality, Greenhouse Gases, Noise, and Transportation and Traffic

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Inyo County Assessor
    Assessor .... Thomas Landshaw
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    Drinking Water Program Manager .... Kathe Barton
Planning
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8.3 DISTRIBUTION LIST

The column heads for the distribution list table provides information on the number of compact disc (CD), electronic copies, and/or paper hard copies of the Draft Environmental Impact Report / Environmental Assessment received by the corresponding recipient.

8.3.1 NEPA/CEQA LEAD AGENCIES

Contact	Mailing Address	Notices Only[1]	CD Copy		Paper Copy	
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[1] Individuals who requested an electronic copy transmitted via email will be sent a hyperlink to the Draft EIR/EA as posted on the District's website.

[2] The Cultural Resources Technical Report has been provided to these agencies and is available to other parties for review on a need-to-know basis.

[3] The Cultural Resources Technical Report has been provided to these agencies and is available to other parties for review on a need-to-know basis.

8.3.2 FEDERAL AGENCIES

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			Vol. 1	Vols. 2 & 3	Vol. 1	Vols. 2 & 3
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8.3.3 STATE AGENCIES

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[6] The Cultural Resources Technical Report has been provided to these agencies and is available to other parties for review on a need-to-know basis.

[7] The Cultural Resources Technical Report has been provided to these agencies and is available to other parties for review on a need-to-know basis. The Governor's Office of Planning and Research California State Clearinghouse requested 15 hard copies of the Executive Summary only.

[8] The Cultural Resources Technical Report has been provided to these agencies and is available to other parties for review on a need-to-know basis.

[9] The Cultural Resources Technical Report has been provided to these agencies and is available to other parties for review on a need-to-know basis.

8.3.5 LOCAL

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[10] Individuals who requested an electronic copy transmitted via email will be sent a hyperlink to the Draft EIR/EA as posted on the District's website.

[11] The Cultural Resources Technical Report has been provided to these agencies and is available to other parties for review on a need-to-know basis.

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			Vol. 1	Vols. 2 & 3	Vol. 1	Vols. 2 & 3
Libraries						
Independence Library	168 North Edwards Street Independence, CA 93526				1	1
Big Pine Library	500 South Main Street Big Pine, CA 93513				1	1
Bishop Library	210 Academy Avenue Bishop, CA 93514				1	1
Lone Pine Library	Intersection of Washington and Bush Streets Lone Pine, CA 93545				1	1

[13] Individuals who requested an electronic copy transmitted via email will be sent a hyperlink to the Draft EIR/EA as posted on the District's website.

8.3.9 OTHER INTERESTED PARTIES

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CHAPTER 9.0
REFERENCES

9.0 REFERENCES

Americans with Disabilities Act. 2004. Chapter 2, "Scoping Requirements." *ADA Accessibility Guidelines*. Available at: http://www.access-board.gov/ADA-ABA/index.htm

Automobile Club of Southern California. 1941. *US395 US6 Map Section from Automobile Club of Southern California Mojave & Colorado Deserts*. Available at: http://www.historicalroadmaps.com/CaliforniaPage/DeathValleyPage/image2.html

Bacon, S.N., Desert Research Institute, Reno, NV. 6 November 2012. Telephone conversation with D. Grotzinger, Sapphos Environmental, Inc. Pasadena, CA.

Bacon, S., and N. Lancaster. 2012. *Geomorphic Map of Keeler Dunes Area*. Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA. Prepared by: Division of Earth and Ecosystem Sciences, Desert Research Institute, Reno, NV.

Barton, K., Inyo County Department of Environmental Health Services, Independence, CA. 25 September 2012. Telephone conversation with D. Grotzinger, Sapphos Environmental, Inc., Pasadena, CA.

Bittner, D., and J. Oakley. 1998. "Golden Eagle (*Aquila chrysaetos*) Population of San Diego County, California." Raptor Research Foundation annual meeting, 3–7 November, Ogden, UT.

Borden, F.W. 1971. *The Use of Surface Erosion Observations to Determine Chronological Sequence in Artifacts from a Mojave Desert Site*. Paper No. 7. Redlands, CA: Archaeological Survey Association of Southern California.

Bureau of Land Management. 25 October 1988. *National Environmental Policy Act BLM Handbook H-1790-1*. Available at: http://www.blm.gov/nhp/efoia/wo/handbook/h1790-1.pdf

Bureau of Land Management. 11 March 2005. *Land Use Planning Handbook*. BLM Handbook H-1601-1. Available at: http://www.blm.gov/nhp/200/wo210/landuse_hb.pdf

Bureau of Land Management. 3 December 2004. *Manual Series 8100*. Available at: www.blm.gov

Bureau of Land Management. January 2008. *National Environmental Policy Act*. Handbook H-1790-1. Washington, DC: U.S. Department of the Interior, Bureau of Land Management, National Environmental Policy Act Program, Section 6.7.1. Available at: http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/blm_handbook.Par.24487.File.dat/h1790-1-2008-1.pdf

Bureau of Land Management. 2008–2009. *Guidelines for Determining Paleontological Significance*. Available at: http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/im_attachments/2008.Par.69083.File.dat/IM2008-009_att1.pdf

Bureau of Land Management. n.d. *Visual Resource Management*. Manual 8400. Washington, DC: U.S. Department of the Interior. Available at: http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/blm_manual.Par.34032.File.dat/8400.pdf

Bureau of Land Management. n.d. *Weed Identification Handbook*. Available at: http://www.blm.gov/ca/st/en/fo/bishop/biological_resources/weeds/weed_identification.html

Bureau of Land Management, Bakersfield District. April 1993. *Bishop Resource Management Plan Record of Decision*. Bakersfield, CA.

Bureau of Land Management, Bakersfield District. April 1993. *Bishop Resource Management Plan Record of Decision*. Appendix 1, "Desired Plant Community Definitions." Bakersfield, CA.

Bureau of Land Management, California Desert District. 1980. *The California Desert Conservation Area Plan*. Riverside, CA.

Burton, Jeffery F. 2005. *Cultural Resources Inventory of a Proposed Temporary Road at Swansea, Inyo County, California*. Manuscript on file, Barnard Construction, Inc., Bozeman, MT.

California Air Pollution Control Officers Association. January 2008. *CEQA and Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act*. Sacramento, CA.

California Air Resources Board. 29 March 2005. *Air Quality and Land Use Handbook: A Community Health Perspective*. Sacramento, CA.

California Air Resources Board. 15 October 2008. *Climate Change Proposed Scoping Plan: A Framework for Change*. Available at: http://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm

California Air Resources Board. Accessed 11 October 2011. "California Ambient Air Quality Standards." Available at: http://www.arb.ca.gov/research/aaqs/caaqs/pm/pm.htm

California Air Resources Board. Accessed 8 November 2012. *2012 Area Designations Rulemaking to Consider Proposed Amendments to the Area Designations for State Ambient Air Quality Standards*, Attachment C, "Maps and Tables of Area Designations for State and National Ambient Air Quality Standards." Available at: http://www.arb.ca.gov/regact/2012/area12/area12.htm

California Code of Regulations, Title 14, Chapter 3, CEQA Guidelines, Section 15064.5(a), (b).

California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000–15387, Appendix G.

California Code of Regulations. 1 November 2002. Title 24: "California Building Standards Code." Sacramento, CA: California Building Standards Commission. Available at: www.bsc.ca.gov.

California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Alquist-Priolo Earthquake Fault Zone Maps. Available at: http://www.quake.ca.gov/gmaps/ap/ap_maps.htm

California Department of Conservation, California Geological Survey. Accessed 24 September 2012. Seismic Hazard Zonation Program. Available at: http://www.conservation.ca.gov/cgs/shzp/Pages/index.aspx

California Department of Conservation, Division of Land Resource Protection, Farmland Mapping and Monitoring Program. Accessed 3 October 2012. Available at: http://www.conservation.ca.gov/DLRP/fmmp/Pages/Index.aspx

California Department of Conservation, Division of Mines and Geology. 1986. *Guidelines for Geologic/Seismic Considerations in Environmental Impact Reports*. Special Publication No. 46. Sacramento, CA.

California Department of Conservation, Division of Mines and Geology. 1997. *Fault-Rupture Hazard Zones in California*. Special Publication 42. Supplements 1 and 2 added 1999. Los Angeles, CA.

California Department of Conservation, Division of Mines and Geology. 1998. *Guidelines for Evaluating the Hazard of Surface Fault Rupture*. Note 49. Sacramento, CA.

California Department of Conservation. Accessed 16 December 2011. Seismic Hazards Zonation Program. Available at: http://www.conservation.ca.gov/cgs/shzp/Pages/Index.aspx

California Department of Finance. July 2007. *Population Projection by Race / Ethnicity for California and Its Counties 2000-2005*. Available at: http://www.dof.ca.gov/research/demographic/reports/projections/p-1/

California Department of Fish and Game. 2008. *Fully Protected Animals*. Sacramento, CA. Available at: http://www.dfg.ca.gov/wildlife/species/t_e_spp/fully_pro.html

California Department of Fish and Game. 2012. *California Natural Diversity Database*. Sacramento, CA.

California Department of Fish and Game. 2012. *California Natural Diversity Database, Rarefind 4*. Sacramento, CA.

California Department of Fish and Wildlife Natural Diversity Database. January 2014. Special Vascular Plants, Bryophytes, and Lichens List. Sacramento, CA.

California Department of Parks and Recreation. 2005. Update to Primary Record for CA-INY-6513H. Site form on file at the Eastern Information Center, University of California, Riverside, CA.

California Department of Transportation (Caltrans). 2009. *State Route 136 Transportation Concept Report*. Bishop, CA: Caltrans District 9 Office of System Planning.

California Department of Transportation. 4 February 2009. *The California Scenic Highway System*. Available at: http://www.dot.ca.gov/hq/LandArch/scenic_highways/index.htm

California Department of Transportation. Accessed 12 July 2010. *The Benefits of Scenic Highway Designation*. Available at: http://www.dot.ca.gov/hq/LandArch/scenic/can_do.htm

California Department of Transportation. Accessed 12 July 2010. "Frequently Asked Questions." Available at: http://www.dot.ca.gov/hq/LandArch/scenic/faq.htm

California Department of Transportation. August 2012. *2011 Traffic Volumes on California State Highway System*. Sacramento, CA.

California Department of Transportation. 13 September 2012. *Eligible (E) and Officially Designated (OD) Routes*. Available at: http://www.dot.ca.gov/hq/LandArch/scenic/cahisys.htm

California Public Resources Code, Division Thirteen, Statutes 21083.2 and 21084.1.

California Public Resources Code, § 2621 et seq.: "Alquist-Priolo Earthquake Fault Zoning Act."

California Public Resources Code, § 2690 et seq.: "Seismic Hazards Mapping Act."

California Public Resources Code, Section 21083.2(g).

California Public Resources Code, Section 5024.1(a), (c).

California Regional Water Quality Control Board, Lahontan Region. 1994. *Water Quality Control Plan*. Available at: http://www.swrcb.ca.gov/lahontan/water_issues/programs/basin_plan/references.shtml

California Regional Water Quality Control Board, Lahontan Region. n.d. *Total Maximum Daily Load Program*. Available at: http://www.swrcb.ca.gov/rwqcb6/water_issues/programs/tmdl/index.shtml

California Stormwater Quality Association. 2003. *California Stormwater Best Management Practice Handbooks: Construction*. Menlo Park, CA. Available at: http://www.cabmphandbooks.com/Documents/Construction/Section_3.pdf

California Streets and Highways Code, Sections 260–284.

City of Los Angeles Department of Water and Power. February 2000. *Initial Study for North Sand Sheet Shallow Flooding Project; Owens Lake Dust Mitigation Program, Owens Lake, California*. Prepared by: CH2M HILL, Santa Ana, CA. Los Angeles, CA.

City of Los Angeles Department of Water and Power. 2001. *Rare Plant Survey Report Owens Dry Lake Dust Control Project Sites*. Los Angeles, CA.

City of Los Angeles Department of Water and Power. August 2001. *Mitigated Negative Declaration Southern Zones Dust Control Project, Owens Lake Dust Mitigation Program, Owens Lake, California*. Prepared by: CH2M HILL, Santa Ana, CA.

City of Los Angeles Department of Water and Power and Inyo County Water Department. 23 June 2004. *Final Environmental Impact Report and Environmental Impact Statement, Lower Owens River Project, Inyo County, California*. Bishop, CA.

Clean Water Team (CWT). 2004. "Electrical Conductivity/Salinity Fact Sheet, FS-3.1.3.0(EC)." In *The Clean Water Team Guidance Compendium for Watershed Monitoring and Assessment*, Version 2.0. Sacramento, CA: Division of Water Quality, California State Water Resources Control Board (SWRCB).

Code of Federal Regulations, Title 36, Part 60.2: "Effects of Listing under Federal Law."

Code of Federal Regulations, Title 36, Part 60.4: "Criteria for Evaluation."

Conway, Chris. 1997. "Observation of Ephemeral Flows and Estimation of Recharge from the Inyo and Coso Mountains, Owens Dry Lake, California." Thesis, University of Nevada, Reno.

Danskin, W.R. 1998. "Evaluation of the Hydrologic System and Selected Water-Management Alternatives in the Owens Valley, California." U.S. Geological Survey Water-Supply Paper 2370. Prepared in cooperation with Inyo County and the Los Angeles Department of Water and Power. Denver, CO: U.S. Geological Survey.

Desert Renewable Energy Conservation Plan. Accessed 22 September 2012. Website. Available at: http://www.drecp.orgcalcining

Desert Research Institute. 17 February 2012. *Mineralogical and Particle Size Analyses to Determine Sand Source(s)*. Reno, NV.

Desert Research Institute. 9 March 2012. *Development of the Keeler Dunefield*, Part 1 – "Analysis of Aerial Photographs and Satellite Images." Reno, NV.

Desert Research Institute. 3 August 2012. *Late Holocene Stratigraphy and Chronology of Keeler Dunes Area*. Preliminary Draft Report. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/attachments/E-Chronology%20and%20Stratigraphy/Lancaster%20and%20Bacon%202012%20-Late%20Holocene%20stratigraphy%20and%20chronology_preliminaryfinaldraft20120831nl.pdf

Driver, H.E. 1937. "Cultural Element Distributions, VI: Southern Sierra Nevada." *University of California Anthropological Records*, *1*(2): 53–154.

Due, J. 1951. "The Carson and Colorado Railroad." *Economic Geography*, *27*(3): 251–267.

Environmental Data Resources, Inc. 19 September 2012. "EDR DataMap Area Study." Inquiry Number 3412980.1s. Milford, CT.

Federal Emergency Management Agency. 16 August 2011. "Inyo County, California Map ID: 06027C2225D, August 16, 2011." Flood Insurance Rate Map. Available at: http://msc.fema.gov/webapp/wcs/stores/servlet/FemaWelcomeView?storeId=10001&catalogId=10001&langId=-1

Garrett, K., and J. Dunn. 1981. *Birds of Southern California: Status and Distribution*. Los Angeles, CA: Los Angeles Audubon Society, p. 408.

Gillies, J. A. July 2012. *Using Plants to Control Sand Movement and Dust Emissions: Keeler Dunes Pilot Project*. Prepared for: Great Basin Unified Air Pollution Control District. Prepared by: Desert Research Institute, Reno, NV.

Good, R.E., R.M. Nielson, H. Sawyer, and L.L. McDonald. 2007. "A Population Estimate for Golden Eagles in the Western United States." *Journal of Wildlife Management*, *71*: 395–402.

Great Basin Unified Air Pollution Control District. Revised 18 January 1979. "Rule 400 - Ringelmann Chart." Available at: http://www.District.org/rulesandregulations/PDF/Rule401.pdf

Great Basin Unified Air Pollution Control District. Adopted 10 May 1994. "Regulation XIII - Conformity of General Federal Actions to State Implementation Plans." Available at: http://www.arb.ca.gov/drdb/gbu/curhtml/reg-13.htm

Great Basin Unified Air Pollution Control District. Adopted 10 May 1994. "Regulation XII-- Conformity to State Implementation Plans of Transportation Plans, Programs, and Projects Developed, Funded or Approved under Title 23 U.S.C. or the Federal Transit Act, District Rule 1231(e) - Procedures for Determining Regional Transportation-Related Emissions." Available at: http://www.arb.ca.gov/drdb/gbu/curhtml/reg-12.htm

Great Basin Unified Air Pollution Control District. 1997. *Characterization of the Owens Lake Basin Hydrology System, Inyo County, California*. Prepared by: Neponset Geophysical Corporation. Bishop, CA.

Great Basin Unified Air Pollution Control District. 2 July 1997. *Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Final Environmental Impact Report*. State Clearinghouse Number 96122077. Bishop, CA.

Great Basin Unified Air Pollution Control District. 1998. *Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan, Addendum No. 1 to the Final Environmental Impact Report*. State Clearinghouse Number 96122077. Bishop, CA.

Great Basin Unified Air Pollution Control District. [2001] Revised 2003. *Archive of Groundwater and Hydrology Data, Owens Lake*. Bishop, CA.

Great Basin Unified Air Pollution Control District. 2002. *Summary of Construction, Analyses and Long Term Monitoring, Keeler/Swansea Site, Owens Lake, Inyo County, California*. Project Number 0211. Final Report. Bishop, CA.

Great Basin Unified Air Pollution Control District. February 2004. *2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Integrated Environmental Impact Report*. State Clearinghouse House No. 2002111020. Prepared by: Sapphos Environmental, Inc., Pasadena, CA. Bishop, CA.

Great Basin Unified Air Pollution Control District and City of Los Angeles Department of Water and Power. November 2006. Settlement Agreement Resolving City's Challenge to the District's Supplemental Control Requirement (SCR) Determination for the Owens Lake Bed. Los Angeles, CA.

Great Basin Unified Air Pollution Control District. Revised 4 December 2006. "Rule 401 - Fugitive Dust." Available at: http://www.District.org/rulesandregulations/PDF/Rule401.pdf

Great Basin Unified Air Pollution Control District. February 2007. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Initial Study*. State Clearinghouse Number 2007021127. Bishop, CA.

Great Basin Unified Air Pollution Control District. 27 February 2007. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan*. Bishop, CA.

Great Basin Unified Air Pollution Control District. 2008. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan—Final Subsequent Environmental Impact Report, Cultural Resources Technical Report*. Prepared by: Sapphos Environmental, Inc., Pasadena, CA. Bishop, CA.

Great Basin Unified Air Pollution Control District. 28 January 2008. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan*. Bishop, CA.

Great Basin Unified Air Pollution Control District. January 2008. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan—Integrated Subsequent Environmental Impact Report*. State Clearinghouse Number 2007021127. Prepared by Sapphos Environmental, Inc. Pasadena, CA.

Great Basin Unified Air Pollution Control District. January 2008. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan—Final Subsequent Environmental Report*. Prepared by: Sapphos Environmental, Inc., Pasadena, CA. Bishop, CA.

Great Basin Unified Air Pollution Control District. 2 July 2008. *Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Final Environmental Impact Report*. State Clearinghouse Number 96122077. Bishop, CA.

Great Basin Unified Air Pollution Control District. February 2009. "Owen Lake Hydrology Monitoring, Data and Chemistry; 1992-2004." Bishop, CA. Available at: http://www.gbuapcd.org/owenslake/hydrology/OwensLakeShallowHydrologyMonitoringDataAndChemistry1992-2004/Final%20Report%20(Compiled%20Text_Figs.pdf

Great Basin Unified Air Pollution Control District. 2011. *Preliminary Constraints Analysis*. Prepared by: Sapphos Environmental, Inc., Pasadena, CA. Bishop, CA.

Great Basin Unified Air Pollution Control District. 2011. "Public Meeting Presentation Materials for January 20, 2010 and August 24, 2011 Public Meetings." Available at: http://www.gbuapcd.org/keelerdunes/reports/index.htm

Great Basin Unified Air Pollution Control District. 2011. *A Summary of the Flora and Fauna Observed in the Keeler Dunes between 11/2007 and 5/2011*. Bishop, CA.

Great Basin Unified Air Pollution Control District. 2011. *Vegetation Cover Analysis*. Available at: http://gbuapcd.org/keelerdunes/presentations/VegetationCoverAnalysis.pdf

Great Basin Unified Air Pollution Control District. 7 September 2012. "Preliminary Staff Report on the Origin and Development of the Keeler Dunes." Bishop, CA.

Great Basin Unified Air Pollution Control District. 2012. Unpublished data. Bishop, CA.

Groeneveld, D.P., HydroBio Advanced Remote Sensing. 12 September 2012. Telephone conversation with D. Grotzinger, Sapphos Environmental, Inc., Pasadena, CA.

Gust, S. May 2003. *Paleontological Assessment Report and Mitigation Plan for the Owens Valley Project, Inyo County, California*. Prepared for: Sapphos Environmental, Inc., Pasadena, CA. Prepared by: Cogstone Resource Management, Inc., Santa Ana, CA.

Gust, Sherri, and Kim Scott. 2008. *Paleontological Evaluation of 2008 Supplemental Control Requirements for the Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan, Inyo County, California*. Prepared for: Sapphos Environmental, Inc., Pasadena, CA. Prepared by: Cogstone Resource Management Inc., Santa Ana, CA.

Halford, F. Kirk, and Kim Carpenter. 2005. *Results of Limited Phase II Testing at the Keeler Dunes Sites, Owens Valley, California*. Cultural Resource Project CA-170-03-11. Prepared by: Far Western Anthropological Research Group, Inc., Davis, CA.

Hamilton, F. 1920. *Seventeenth Annual Report of the State Mineralogist*. Volume XVII. Sacramento, CA: California State Mining Bureau.

Hancock, Paul. 18 November 2004. "Keeler Right of Way, History and Chronology." Independence, CA: County of Inyo Department of Public Works.

Haverstock, Greg. 17–20 March 2010. "Stones and Bones: The Southern Owens Valley Mortuary Complex." Paper presented at the Society for California Archaeology, 2010 annual meeting, Riverside, CA.

Haverstock, Greg, Bureau of Land Management Bishop Field Office, Bishop, CA. 14 March 2014. Comment at galley proof meeting with Sapphos Environmental, Inc. and the Great Basin Unified Air Pollution Control District, Pasadena, CA, and Bishop, CA.

Holder, Grace, Great Basin Unified Air Pollution Control District, Bishop, CA. 13 September 2011. Email to Donna Grotzinger, Sapphos Environmental, Inc., Pasadena, CA. Subject: Water Resources in the Keeler Dunes Area.

Holder, G., Great Basin Unified Air Pollution Control District, Bishop, CA. 28 September 2011. Email to D. Grotzinger, Sapphos Environmental, Inc., Pasadena, CA.

Holder, G., Great Basin Unified Air Pollution Control District, Bishop, CA. 9 October 2012. Telephone conversation with D. Grotzinger, Sapphos Environmental, Inc., Pasadena, CA.

Holland, Robert F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California*. Sacramento, CA.

Hollett, K., Danskin, W., McCaffrey, W., and Walti, G. 1991. *Geology and Water Resources of Owens Valley, California*. U.S. Geological Survey Water Supply Paper 2370-B. Denver, CO: U.S. Geological Survey.

HydroBio Advanced Remote Sensing. October 2011. "Stabilizing Keeler Dunes Rapidly Using Native Vegetation and Minimal Inputs." Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA.

HydroBio Advanced Remote Sensing. August 2012. "Allometry Model for Cattle Spinach (*Atriplex polycarpa*) in Support of Planning for Keeler Dunes Stabilization." Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA.

Inyo County. 30 June 2003. "Zoning Ordinance," Title 18, *Inyo County Code*. Independence, CA.

Inyo County, California State Lands Commission, and Bureau of Land Management. 1994. *Draft Environmental Impact Report/Environmental Impact Statement, Owens Lake Soda Ash Company Soda Ash Mining and Processing Project*. Bishop, CA.

Institute of Transportation Engineers. 2009. *Trip Generation Manual*, 8th Edition. Washington, DC.

Inyo County Department of Parks and Recreation. 2008. *Parks and Recreation*. Available at: http://www.inyocounty.us/campgrounds/index.htm

Inyo County Local Transportation Commission. 22 April 2009. *Inyo County Regional Transportation Plan*. Independence, CA.

Inyo County Planning Committee. December 2011. *Draft Owens Lake Master Plan*. Review Draft. Independence, CA.

Inyo County Planning Department. December 2001. *Inyo County General Plan*. Independence, CA.

Inyo County Planning Department. December 2001. *Inyo County General Plan, Conservation and Open Space Element*. Independence, CA.

Inyo County Planning Department. December 2001. *Inyo County General Plan, Land Use Element*. Independence, CA.

Inyo County Planning Department. December 2001. *Inyo County General Plan, Public Safety Element*. Independence, CA.

Inyo County Planning Department. January 2004. *Trona Processing Upgrade Project Environmental Impact Report*. State Clearinghouse No. 2003041127. Independence, CA.

Inyo County Planning Department. August 2012. *Crystal Geyser Roxane Cabin Bar Ranch Water Bottling Facility – Draft Environmental Impact Report*. Independence, CA. Available at: http://inyoplanning.org/projects.htm

Inyo County Water Department. 1997. *Memorandum of Understanding*. Available at: http://www.inyowater.org/Water_Resources/mou/default.html

Inyo County Water Department. January 2012. *Draft Lower Owens River Recreation Use Plan*. Independence, CA.

Jones & Stokes Associates, Inc. 1996. *Delineation of Waters of the United States for the Owens Lake Playa* (JSA 95-330). Prepared for: U.S. Army Corps of Engineers, Los Angeles District, Ventura, CA. Prepared by: Jones & Stokes Associates, Inc., Sacramento, CA; and Great Basin Unified Air Pollution Control District, Bishop, CA.

Jones & Stokes Associates, Inc. 2007. *Cultural Resources Inventory of Two Parcels in the Moat and Row Testing Area, Owens Lake Dust Mitigation Program, Inyo County, California*, Figure 8. Prepared for: City of Los Angeles Department of Water and Power, Los Angeles, CA.

Jorat, S, Civil Engineer Associate, City of Los Angeles Department of Water and Power. 11 October 2012. Telephone conversation with D. Grotzinger, Sapphos Environmental, Inc., Pasadena, CA.

Kahrl, W. 1982. *Water and Power*. Berkeley, CA: University of California Press.

Kiddoo, P., Great Basin Unified Air Pollution Control District, Bishop, CA. 11 October 2012. Air quality data provided to Sapphos Environmental, Inc., Pasadena, CA.

Kiddoo, P., Great Basin Unified Air Pollution Control District, Bishop, CA. 10 October 2012. Email to Makeba Pease, Sapphos Environmental, Inc., Pasadena, CA.

Kingsley, Matt, Rio Tinto Minerals, Lone Pine, CA. 20 September 2012. Personal conversation with D. Grotzinger, Sapphos Environmental, Inc., Pasadena, CA.

Kroeber, A.L. 1925. *Handbook of the Indians of California*. New York, NY: Dover, p. 556.

Lahontan Regional Water Quality Control Board. n.d. *Basin Plan*. Available at: http://www.swrcb.ca.gov/rwqcb6/water_issues/programs/basin_plan/index.shtml

Lancaster, N. March 2012. *Development of the Keeler Dunefield, Inyo County, California*, Part 1, "Analysis of Aerial Photographs and Satellite Imagery." Prepared by: Desert Research Institute, Reno, NV. Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA.

Linscott, Law & Greenspan. 28 September 2012. *Draft Traffic Impact Study, Keeler Dunes Dust Mitigation Project*. Prepared for: Sapphos Environmental, Inc., Pasadena, CA.

Lisius, S., Bureau of Land Management, Bishop Field Office. 18 October 2012. Email to Donna Grotzinger, Sapphos Environmental, Inc., Pasadena, CA. Subject: "Contact Report Form Attached."

Los Angeles Department of Water and Power. 23 June 2004. *Final Environmental Impact Report, Lower Owens River Project*. Bishop, CA.

Martinson, Sharon J. May 2012. "Summary of Services Provided & Results." Prepared for: Sapphos Environmental, Inc., Pasadena, CA.

McCaffery, B.J., and C. McIntyre. 2005. "Disparities between Results and Conclusions: Do Golden Eagles Warrant Special Concern Based on Migration Counts in the Western United States?" *Condor*, *107*: 469–473.

McLeod, Samuel, Natural History Museum of Los Angeles County, Los Angeles, CA. 11 October 2011. Letter response to Clarus Backes, Sapphos Environmental, Inc., Pasadena, CA.

MWH Americas, Inc. November 2011. "Owens Lake Groundwater Evaluation Project, Updated Conceptual Model Report- FINAL." Prepared for: Los Angeles Department of Water and Power, Los Angeles, CA.

National Oceanic and Atmospheric Administration. Accessed 20 September 2012. *Essential Fish Habitat Mapper*. Available at: http://www.habitat.noaa.gov/protection/efh/habitatmapper.html

National Wild and Scenic Rivers System. Accessed 13 August 2012. Website. Available at: http://www.rivers.gov/rivers/california.php

Nelson, Matthew, Tribal Historic Preservation Officer and NAGPRA Coordinator, Bishop Paiute Tribe, Bishop, CA. 8 December 2011. Email response to Clarus Backes, Sapphos Environmental, Inc., Pasadena, CA.

Office of Historic Preservation. n.d. "Technical Assistance Bulletin 6: California Register and National Register, A Comparison (for Purposes of Determining Eligibility for the California Register)." Available at: www.ohp.parks.ca.gov

Office of Historic Preservation, Department of Parks and Recreation, State of California. n.d. "California Historical Landmarks Registration Programs." Available at: www.ohp.parks.ca.gov

Page, G.W., J.S. Warriner, J.C. Warriner, and P.W.C. Paton. 1995. "Snowy Plover (Charadrius alexandrinus)." In *The Birds of North America*, No. 154, ed. A. Poole and F. Gill. Philadelphia, PA: Academy of Natural Sciences; Washington, DC: American Ornithologists' Union.

Philip A. Munz, and D.D. Keck. 1949. "California Plant Communities." *El Aliso 2*(1): 87–105.

Porter, C. 1984. *Final Environmental Impact Report Inyo Marble*, Appendix E: "Geohydrology Study of the Swansea Alluvial Fan Area for the Proposed Inyo-Marble Development of Dolomite, California." Prepared by: Applied Geotechnical, Reno, NV.

Primary Site Record for CA-INY-6502 and CA-INY-6503 (Update). n.d. Record on file at the Bureau of Land Management, Bishop Field Office, Bishop, CA.

Primosch, Lawrence R., Bureau of Land Management, Bishop Field Office, Bishop, CA. 11 April 2012. Conference call with Laura Kaufman, Donna Grotzinger, and Leanna Guillermo, Sapphos Environmental, Inc., Pasadena, CA.

Primosch, Lawrence R., Bureau of Land Management, Bishop Field Office, Bishop, CA. 24 April 2012. Proposed Project Site Visit with Grace Holder, Great Basin Unified Air Pollution District, Bishop, CA, and David Lee and Leanna Guillermo, Sapphos Environmental, Inc., Pasadena, CA.

Sapphos Environmental, Inc. 27 February 2007. *2008 State Implementation Plan Initial Study*. Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA. Pasadena, CA.

Sapphos Environmental, Inc. 2008. *Integrated Subsequent Environmental Impact Report*. Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA. Pasadena, CA.

Sapphos Environmental, Inc. 12 July 2011. Memorandum for the Record No. 1. Subject: Summary of the June 29, 2011, Project Kickoff Meeting for the Keeler Dunes Environmental Impact Report / Environmental Impact Statement. Pasadena, CA.

Sapphos Environmental, Inc. November 2011. *Preliminary Constraints Analysis for the Keeler Dunes Dust Control Project*. Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA. Pasadena, CA.

Sapphos Environmental, Inc. 11 November 2011. Memorandum for the Record. Subject: Historical Research of Keeler Dunes, by Leslie Heumann and Marlise Fratinardo. Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA. Pasadena, CA.

Sapphos Environmental, Inc. October 2012. *Keeler Dunes Dust Control Project: Screen Check Cultural Resources Technical Report*. Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA. Pasadena, CA.

Sapphos Environmental, Inc. November 2012. *Keeler Dunes Dust Control Project: Screen Check Air Quality and Greenhouse Gas Emissions Technical Impact Report*. Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA. Pasadena, CA.

Sawyer, J.O., and T. Keeler-Wolf. 2009. *A Manual of California Vegetation*. 2nd Edition. Sacramento, CA: California Native Plant Society.

Schultz, B.W. 1996. *Evaluation of Change in Wetlands at Owens Lake Playa between 1977 and 1992 Using MSS Satellite Imagery and Color Infrared Photography*. Publication No. 41154. Draft Report Submitted to Great Basin Unified Air Pollution Control District, Bishop, CA. Reno, NV: Desert Research Institute.

Scott, Eric, San Bernardino County Museum, Redlands, CA. 28 February 2012. Letter response to Tiffany Clark, Sapphos Environmental, Inc., Pasadena, CA.

Shuford, W.D., and T. Gardali, eds. 2008. "California Bird Species of Special Concern: A Ranked Assessment of Species, Subspecies, and Distinct Populations of Birds of Immediate Conservation Concern in California." In *Studies of Western Birds 1*. Camarillo, CA: Western Field Ornithologists; Sacramento, CA: California Department of Fish and Game.

Sibley, D.A. 2000. *The Sibley Guide to Birds*. New York, NY: Alfred A. Knopf.

Singleton, Dave, Native American Heritage Commission, Sacramento, CA. 31 August 2011. Letter response to Clarus Backes, Sapphos Environmental, Inc., Pasadena, CA.

South Coast Air Quality Management District. 11 February 2011. "CalEEMod 2011.1.1Program." Available at: http://caleemod.com/

State of California. 1994. California Desert Protection Act of 1994, 16 U.S.C. §§ 410aaa to 410aaa-83.

State of California Special Studies Map. 1 January 1990. *Bartlett Quadrangle*. Revised Official Map. Sacramento, CA.

State of California Special Studies Map. 1 January 1990. *Lone Pine Quadrangle*. Revised Official Map. Sacramento, CA.

State of California Special Studies Map. 1 January 1990. *Olancha Quadrangle*. Revised Official Map. Sacramento, CA.

Steward, J.H. 1934. "Two Paiute Ethnographies." *University of California Publications in American Archaeology and Ethnology*, *33*(5): 423–438.

Steward, J.H. 1937. "Linguistic Distributions and Political Groups of the Great Basin Shoshoneans." *American Anthropologist*, *39*(4): 625–634.

Steward, J.H. 1938. "Basin Plateau Aboriginal Sociopolitical Groups." *Bureau of American Ethnology Bulletin*, *120*. Washington, DC.

Turner, George. 1965. *Narrow Gauge Nostalgia*. Harbor City, CA: J-H Publications.

U.S. Census Bureau. August 2003. *Income in the American Community Survey: Comparisons to Census* 2000. Available at: www.census.gov\acs\www\Downloads\methodology\ASA_nelson.pdf

U.S. Census Bureau. 2010. *2010 Census*. Washington, DC.

U.S. Census Bureau. Accessed 26 March 2012. *Differences between the Income and Poverty Estimates from the American Community Survey and the Annual Social and Economic Supplement to the Current Population Survey*. U.S. Census Fact Sheet. Available at: http://www.census.gov/hhes/www/poverty/about/datasources/factsheet.html

U.S. Census Bureau. Accessed 1 June 2012. "Quick Facts." Available at: http://quickfacts.census.gov/qfd/states/06/0644000.html

U.S. Census Bureau. Accessed 4 June 2012. *2006-2010 American Community Survey, Selected Economic Characteristics and Poverty Status in the Past 12 Months*. Available at: http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml

U.S. Census Bureau. n.d. "Poverty Guidelines." Available at: http://www.census.gov/hhes/www/poverty/methods/definitions.html

U.S. Department of Agriculture Natural Resources Conservation Service. 2012. *2012 National Wetland Plant List*. Available at: http://plants.usda.gov/wetland.html

U.S. Department of Energy. 1998. "Method for Calculating Carbon Sequestration by Trees in Urban and Suburban Settings. Voluntary Reporting of Greenhouse Gases." Washington, DC: U.S. Department of Energy, Energy Information Administration. Available at: http://www.epa.gov/cleanenergy/energy-resources/refs.html#seedlings

U.S. Department of the Interior, National Park Service. 2002. *How to Apply the National Register Criteria for Evaluation*. National Register Bulletin 15. Washington, DC.

U.S. Department of Transportation, Federal Highway Administration and the State of California Department of Transportation. August 2010. *Olancha/Cartago Four-Lane Project, Initial Study with Proposed Mitigated Negative Declaration/Environmental Assessment*. Washington, DC, and Sacramento, CA. Available at: http://www.dot.ca.gov/dist9/projects/olancha/docs/draft_olancha-cartago_envir_doc.pdf

U.S. Environmental Protection Agency. 26 September 1996. "Approval and Promulgation of Implementation Plans and Redesignation of Puget Sound, Washington for Air Quality Planning Purposes: Ozone." *Federal Register*, *61* (188). Available at: http://yosemite.epa.gov/r10/airpage.nsf/283d45bd5bb068e68825650f0064cdc2/e1f3db8b006eff1a88256dcf007885c6/$FILE/61%20FR%2050438%20Seattle%20Tacoma%20Ozone%20MP.pdf

U.S. Environmental Protection Agency. 15 August 1997. *Transportation Conformity Rule Amendments: Flexibility and Streamlining*. Available at: http://www.epa.gov/USEPA-AIR/1997/August/Day-15/a20968.htm

U.S. Environmental Protection Agency. 2005. Federal Clean Air Act, Title I, Air Pollution Prevention and Control. Available at: http://www.epa.gov/oar/caa/contents.html

U.S. Environmental Protection Agency. 19 April 2011. *General Conformity Regulations*. Available at: http://epa.gov/ttncaaa1/genconformity.html

U.S. Environmental Protection Agency. 30 August 2011. *Green Book: Currently Designated Nonattainment Areas for All Criteria Pollutants*. Available at: http://www.epa.gov/oaqps001/greenbk/ancl3.html

U.S. Environmental Protection Agency. Accessed 10 October 2011. *National Ambient Air Quality Standards*. Available at: http://www.epa.gov/air/criteria.html

U.S. Environmental Protection Agency. Accessed 5 January 2012. *Air Data*. Available at: http://www.epa.gov/airdata/ad_data_daily.html

U.S. Fish and Wildlife Service. September 1998. *Owens Basin Wetland and Aquatic Species Recovery Plan*. Portland, OR.

U.S. Fish and Wildlife Service. 2006. *Owens Basin Wetland and Aquatic Species Recovery Plan: Inyo and Mono Counties, California*. Washington, DC.

U.S. Fish and Wildlife Service. 2011. *USGS 7.5-Minute Series National Wetland Inventory Map: Dolomite, California*. Ventura, CA.

U.S. Fish and Wildlife Service. 2012. *National Wetlands Inventory*. Available at: http://www.fws.gov/wetlands/index.html

U.S. Fish and Wildlife Service, National Wildlife Refuge System. Accessed 13 August 2012. Website. Available at: http://www.fws.gov/refuges/whm/ramsar.html

U.S. Geological Survey. [1913] Reprinted 1921. *1:250,000 Series Ballarat, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1951. *15-Minute Topographic Map of Keeler, CA*. Denver, CO.

U.S. Geological Survey. 1982. *7.5-Minute Series, Haiwee Reservoirs, California Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1982. *7.5-Minute Series Union Wash, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1987. *7.5-Minute Series, Bartlett, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1987. *7.5-Minute Series, Centennial Canyon, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1987. *7.5-Minute Series, Cerro Gordo Peak, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1987. *7.5-Minute Series, Dolomite, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1987. *7.5-Minute Series, Keeler, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1987. *7.5-Minute Series, New York Butte, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1987. *7.5-Minute Series, Olancha, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1987. *7.5-Minute Series, Owens Lake, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1987. *7.5-Minute Series, Vermillion Canyon, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1988. *7.5-Minute Series, Templeton Mountain, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1994. *7.5-Minute Series, Lone Pine, California, Topographic Quadrangle*. Denver, CO.

United States Code, Title 16, Section 470: "National Historic Preservation Act."

United States Code, Title 33, Section 1341: "A Certification."

United States Code, Title 42, Chapter 82, Subchapter I, §§ 6901 et seq.: "Solid Waste Disposal Act, Resource Conservation and Recovery Act of 1986." Available at: http://www.law.cornell.edu/uscode/html/uscode42/usc_sup_01_42_10_82.html

United States Code, Title 42, Chapter 103, Subchapter I: "Hazardous Substances Releases, Liability, Compensation." Available at: http://www.law.cornell.edu/uscode/html/uscode42/usc_sup_01_42_10_103.html

Warren, Claude N. 1984. "The Desert Region." In *California Archaeology*, ed. Michael J. Moratto. Orlando, FL: Academic Press, pp. 339–430.

Weeks, Kay D., and Anne E. Grimmer. 1995. *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring and Reconstruction Historic Buildings*. Washington, DC: U.S. Department of the Interior, National Park Service.

West's Annotated California Codes. 1984. Volume 69, "Water Code Sections 30000 to 38999. Official California Water Code Classification." St. Paul, MN: West.

The White House Council on Environmental Quality. 18 February 2010. *Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions*. Available at: http://www.whitehouse.gov/sites/default/files/microsites/ceq/20100218-nepa-consideration-effects-ghg-draft-guidance.pdf

Wilke, P.J., and H.W. Lawton, eds. 1976. *The Expedition of Capt. J. W. Davidson from Fort Tejon to the Owens Valley in 1859*. Socorro, NM: Ballena.

Wirganowicz, M. 1997. "Numerical Simulation of the Owens Lake Groundwater Basin, California." Unpublished thesis, University of Nevada, Reno.

Wolfe, S.A, and W.G. Nickling. 1993. "The Protective Role of Sparse Vegetation in Wind Erosion." *Prog Phys Geogr*, *17*:50–68.

Yohe, R.M. 1998. "The Introduction of the Bow and Arrow and Lithic Resource Use at Rose Spring (CA-INY-372)." *Journal of California and Great Basin Anthropology*, *20*: 26–52.

Yohe, Robert M., II. 1992. "A Reevaluation of Western Great Basin Cultural Chronology and Evidence for the Timing of the Introduction of the Bow and Arrow to Eastern California Based on New Excavations at the Rose Spring Site CA-INY-372." PhD dissertation, University of California, Riverside.

KEELER DUNES DUST CONTROL PROJECT

DRAFT ENVIRONMENTAL IMPACT REPORT / ENVIRONMENTAL ASSESSMENT

VOLUME II

Prepared for:

Bureau of Land Management, Bishop Field Office
351 Pacu Lane Suite 100
Bishop, California 93514

and

Great Basin Unified Air Pollution Control District
157 Short Street
Bishop, California 93514

Prepared by:

Sapphos Environmental, Inc.
430 N. Halstead Street
Pasadena, California 91107

March 21, 2014

APPENDIX A
NOTICE OF PREPARATION

Theodore D. Schade
Air Pollution Control Officer

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT
157 Short Street, Bishop, California 93514-3537
760-872-8211 Fax: 760-872-6109

Notice of Preparation

TO: Distribution List

FROM: Great Basin Unified Air
Pollution Control District
157 Short Street
Bishop, California 93514-3537

Subject: **Notice of Preparation of a Draft Environmental Impact Report for the Keeler Dunes Particulate Matter Air Pollution (PM_{10}) Non-attainment Area Project (Proposed Project)**

The Great Basin Unified Air Pollution Control District (District), in coordination with the U.S. Department of Interior Bureau of Land Management (BLM) Bishop Field Office, intends to prepare an Environmental Impact Report (EIR) for the development of strategies to mitigate windblown dust that is contributing to the non-attainment of the National Ambient Air Quality Standards for the PM_{10} air pollutant in the Keeler Dunes (proposed project site) near the community of Keeler, Inyo County, California. The District and the BLM will be the lead agencies responsible for coordinating the environmental analysis pursuant to the California Environmental Quality Act and the National Environmental Policy Act (NEPA), respectively. The U.S. Environmental Protection Agency will be a cooperating federal agency. A separate Notice of Intent will be prepared for the environmental analysis under NEPA.

The District is seeking input from regulatory agencies and other interested parties regarding the scope and intent of the information to be included in the EIR. Scoping has been helpful to agencies in identifying the range of actions, alternatives, mitigation measures, and significant effects to be analyzed in depth in an EIR and in eliminating detailed studies of issues not found to be significant. Responsible and trustee agencies will need to use the EIR when considering permits or related approvals for the proposed project.

The proposed project site is located northwest of Keeler, on lands administered by the BLM and the City of Los Angeles Department of Water and Power, and is approximately 1.0 square mile in size. The proposed project site is bounded approximately by California State Route 136 on the east-northeast and the dry Owens Lake bed shoreline on the west-southwest, and extends approximately 2.5 miles to the northwest from Keeler.

The District's goal is to use dust mitigation measures that stabilize the sand dunes and have a low impact to natural resources within the Keeler Dunes. Dust-control efforts may include a variety of measures, such as establishment and management of native vegetation, wind breaks, and barriers; spraying of the sand with water or other dust-suppressing substances; and placement of gravel with or without an underlying geotextile fabric in selected areas.

Due to the time limit mandated by State law, responses must be submitted no later than 5:00 p.m. on Friday, November 25, 2011. Please send letters of comment (including the name of the designated contact person for your agency) on the Notice of Preparation to the following address:

Great Basin Unified Air Pollution Control District
Attn: Mr. Theodore D. Shade
157 Short Street, Suite 6
Bishop, California 93514-3537

Comments can also be submitted electronically at: keelerdunesproject@gmail.com

Agencies and organizations should identify a point of contact for future coordination.

Scoping meetings: On Monday, November 14, 2011, the District and BLM will host two scoping meetings to review the various project elements and solicit information in relation to CEQA analysis for the proposed project. Both meetings will take place at the Board of Supervisors Chamber of the Inyo County Administrative Center, located at 168 North Edwards Street, Independence, California 93526. The public agency meeting will be from 2:00 p.m. to 4:00 p.m. and the general public meeting will be from 6:00 p.m. to 8:00 p.m.

Signature: Mr. Theodore D. Schade

Telephone: (760) 872-8211

Title: Air Pollution Control Officer

Date: October 25, 2011

APPENDIX B
VISUAL RESOURCES
TECHNICAL REPORT

KEELER DUNES DUST CONTROL PROJECT
VISUAL RESOURCES TECHNICAL REPORT

Prepared for:

Great Basin Unified Air Pollution Control District
154 Short Street
Bishop, California 93514

Prepared by:

Sapphos Environmental, Inc.
430 North Halstead Street
Pasadena, California 91107

March 21, 2014

TABLE OF CONTENTS

FIGURES		*FOLLOWS PAGE*

APPENDICES

SECTION 1.0
INTRODUCTION

1.1 PURPOSE AND SCOPE

This Visual Resources Technical Report was prepared by Sapphos Environmental, Inc. for the Great Basin Unified Air Pollution Control District (District) to provide the characterization of baseline resources and visualization of the proposed Keeler Dunes Dust Control Project (proposed project / proposed action) that will serve as the basis for analyzing the potential impacts to visual character or visual quality. This Visual Resources Technical Report was prepared to compile the Visual Resource Inventory (VRI) as required by the Bureau of Land Management (BLM) and characterize the visual resources that would potentially be affected by construction and operation of the proposed project / proposed action. Acting in its capacity as a lead agency under the National Environmental Policy Act (NEPA), the BLM would need to determine the potential for the proposed action to result in significant impacts, consider mitigation measures and alternatives capable of avoiding significant impacts, and take the environmental effects of the proposed project / proposed action into consideration as part of its decision-making process. The visual character and quality at the proposed project / proposed action were evaluated using the BLM VRI and the Visual Resource Management (VRM) Manual to determine the extent of proposed action impacts.[1,2]

This Visual Resources Technical Report provides baseline data completed by the District's consultant in coordination with the BLM Bishop, California, office. The baseline data serves as evidence of existing conditions upon which the required evaluation of proposed project / proposed action impacts and the feasibility of mitigation measures in relation to visual resources can be made. This technical study identifies and evaluates key visual resources in the proposed project / proposed action area and determines the degree of visual impacts that could occur from the proposed project / proposed action on the existing landscape and built environment. This technical study evaluates potential aesthetic impacts associated with the proposed project / proposed action and provides a graphic visualization of the proposed project / proposed action elements and the surface viewsheds from selected points within and near the approximately 194-acre proposed project / proposed action area as necessary.

This Visual Resources Technical Report provides baseline information that was prepared by regulatory agencies and the District's consultant. Site-specific data records from BLM-approved key observation points (KOPs) were prepared by the District's consultant. This Visual Resources Technical Report was prepared based on information provided by the BLM Bishop Field Office, including KOP locations.[3]

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[1] Bureau of Land Management. n.d. *Visual Resources Inventory*. Manual H-8410-1. Washington, DC: U.S. Department of the Interior. Available at: http://www.blm.gov/nstc/VRM/8410.html

[2] Bureau of Land Management. n.d. *Visual Resources Management*. Manual 8400. Washington, DC: U.S. Department of the Interior. Available at: http://www.blm.gov/nstc/VRM/8400.html

[3] Primosch, Lawrence R., Bureau of Land Management, Bishop Field Office, Bishop, CA. 24 April 2012. Proposed Project Site Visit with Grace Holder, Great Basin Unified Air Pollution District, Bishop, CA, and David Lee and Leanna Guillermo, Sapphos Environmental, Inc., Pasadena, CA.

1.2 TERMS AND CONCEPTS

The following terms and concepts are used to describe and assess the aesthetics setting and impacts from the proposed project / proposed action on BLM-administered land:[4]

- **Color:** The hue (e.g., red, brown) and value (e.g., light, dark) of the light reflected by objects in the visual landscape.

- **Contrast:** The opposition or unlikeness of different forms, lines, colors, or textures in a landscape.

- **Cultural modification:** Any human-caused change in the land form, water form, or vegetation, or addition of a structure that creates a visual contrast in the basic elements (form, line, color, and texture) of the naturalistic character of a landscape.

- **Form:** The visual mass, bulk, or shape of an object or objects in the visual landscape that appear unified. This element of visual character is usually the strongest.

- **Key Observation Point (KOP):** One or a series of points on a travel route or at a use area or potential use area where the view of a management activity (action) would be the most revealing.

- **Line:** The well-defined edges of shapes or masses created in the visual landscape by horizons, silhouettes, or human-made features. This element of visual character is usually the second strongest.

- **Texture:** The apparent surface coarseness of the visual landscape caused by the aggregation or density of surface features and vegetation (e.g., fine, medium, coarse). This element of visual character is usually the least dominant.

- **Viewshed:** The landscape that can be directly seen under favorable atmospheric conditions, from a viewpoint or along a transportation corridor.

- **Visual (sensitive) receptor:** Any scenic vista, scenic highway, residence, or public recreational area located within the proposed project / proposed action viewshed that provides people with views of a site.

[4] Bureau of Land Management. n.d. *Visual Resources Inventory*. Manual H-8410-1. Washington, DC: U.S. Department of the Interior. Available at: http://www.blm.gov/nstc/VRM/8410.html

SECTION 2.0
PROJECT DESCRIPTION

2.1 LOCATION

The proposed project / proposed action is located immediately northwest of the community of Keeler in Inyo County, California and is approximately 194 acres in size and located within an 870-acre (1.36-square-mile) study area. The proposed project / proposed action is located east of the 110-square-mile (70,000-acre) Owens Lake Bed, located within the Owens Valley in Inyo County, California (Figure 2.1-1, *Regional Vicinity Map*). The proposed project / proposed action is located approximately 10 miles southeast of the town of Lone Pine and approximately 65 miles southeast of the City of Bishop. The proposed project / proposed action is located approximately 10 miles to the west of Death Valley National Park, approximately 11 miles to the east of Inyo National Forest, approximately 23 miles to the east of Sequoia National Park, and approximately 48 miles north of the City of Ridgecrest (Figure 2.1-1). There are two communities in the vicinity of the proposed project / proposed action located in the unincorporated area of Inyo County: the community of Keeler southeast and adjacent to the proposed project / proposed action, and the community of Swansea to the north (Figure 2.1-2, *Project Location Map*). One designated Native American reservation, the Lone Pine Paiute-Shoshone Indian Reservation, is located approximately 10 miles to the northwest (Figure 2.1-1). The proposed project / proposed action study area is located within the Owens Valley Planning Area (OVPA) (Figure 2.1-3, *Proposed Project in Relation to Owens Valley Planning Area*). The OVPA is situated in the southern end of the Owens Valley, and implementation of various dust control measures (DCMs) on the former bed of Owens Lake has been ongoing since the year 2000.

The location of the study area is depicted on the U.S. Geological Survey (USGS) 7.5-minute series, Owens Lake and Dolomite, topographic quadrangles[1,2] (Figure 2.1-4, *Topographic Map of Project Study Area with USGS 7.5-Minute Quadrangle Index*). There is a 280-foot elevation difference between the highest and the lowest area of the study area. The topography of the study area consists of alluvial fan and former shorelines of Owens Lake covered by sand sheets and sand dunes; elevation ranges from approximately 3,600 feet above mean sea level (MSL) to approximately 3,885 feet above MSL.

The study area is bounded approximately by the Inyo Mountains on the east-northeast and the historic Owens Lake bed on the west-southwest, and extends approximately 2.5 miles to the northwest from the community of Keeler. California State Highway 136 (SR 136) bisects the 870-acre study area. The study area is located primarily on lands administered by the U.S. Department of Interior Bureau of Land Management Bishop Office (BLM) and the City of Los Angeles Department of Water and Power (LADWP). Other stakeholders include Inyo County, the local Lone Pine-Paiute Shoshone Tribes, California Department of Transportation (Caltrans) District 9, Southern Pacific Railroad, Keeler Community Services District, and Keeler residents.

[1] U.S. Geological Survey. 1987. *7.5-Minute Series, Owens Lake, California, Topographic Quadrangle*. Reston, VA.

[2] U.S. Geological Survey. 1987. *7.5-Minute Series, Dolomite, California, Topographic Quadrangle*. Reston, VA.

2.2 STUDY AREA

The 1.36-square-mile study area is inclusive of the proposed project / proposed action area and six alternatives evaluated in the Environmental Impact Report / Environmental Assessment prepared to support the respective land use decision-making processes of the Great Basin Unified Air Pollution Control District (District) and the BLM. The proposed project / proposed action involves DCMs applied to 194 acres using irrigation water transported by water trucks from the Fault Test (FT) well, located approximately 3/4-mile west of the northern portion of the study area, to staging areas for delivery via all-terrain vehicles (ATVs). Alternatives 1 and 2 consider DCMs in the same area as the proposed project / proposed action with an increase in DCMs applied to 214 (20 additional acres) and 197 acres (3 additional acres), respectively. Alternative 3 involves DCMs applied to the same 194 acres as the proposed project / proposed action using a combination of supplemental irrigation water delivered by temporary aboveground polyvinyl chloride (PVC) pipelines and manual watering in selected areas of environmental sensitivity, with irrigation water for watering events supplied by water delivery trucks and three 20,000-gallon dark olive green painted water storage tanks with manifolds and booster pumps at Staging Areas 1, 2, and 3. Alternative 4 involves DCMs applied to the same 194 acres as the proposed project / proposed action using water transported by water trucks to roadside turnouts on the west side of State Route 136 for direct connection to a combination of irrigation water delivered by temporary aboveground PVC pipelines through beige/tan painted trunk lines at the turnouts and manual watering in selected areas of environmental sensitivity. Alternative 5 involves DCMs applied to the same 194 acres as the proposed project / proposed action using water supplied via the existing Keeler Community Service District (KCSD) well and a beige/tan painted pipeline and delivered using a combination of irrigation water delivered by temporary aboveground PVC pipelines and manual watering in selected areas. Alternative 6 is the no project / no action alternative. This Visual Resources Technical Report covers the entire area for the proposed project / proposed action study area and Alternatives 1 through 5.

2.3 PROPOSED PROJECT / PROPOSED ACTION

The proposed project / proposed action is a program to stabilize a portion of the Keeler sand dunes and associated sand deposits and reduce dust emissions that are causing and contributing to exceedances of the National Ambient Air Quality Standards (NAAQS) and California State Standard for PM_{10} in the communities of Keeler and Swansea, California. The proposed project / proposed action is designed to meet the required standards for healthful air quality in these communities. Elements of the proposed project / proposed action include placement of straw bales as a temporary windbreak, planting and establishment of native vegetation, and long-term air monitoring.

2.2.1 Elements

The DCM involves the establishment of a mix of native vegetation within specified dust emitting areas of the Keeler Dunes. The goal would be to create a natural vegetated dune environment that mimics comparable natural environments such as the existing Swansea Dunes (located to the northeast) and other stable shoreline dunes in the region. The establishment of native vegetation would act to prevent high emissions of dust by breaking up the wind and lowering the wind speed at the ground surface.

The proposed project / proposed action would entail placement of 123,185 straw bales and 369,555 native plants in approximately 194 acres within the dunes to achieve 85 percent (17

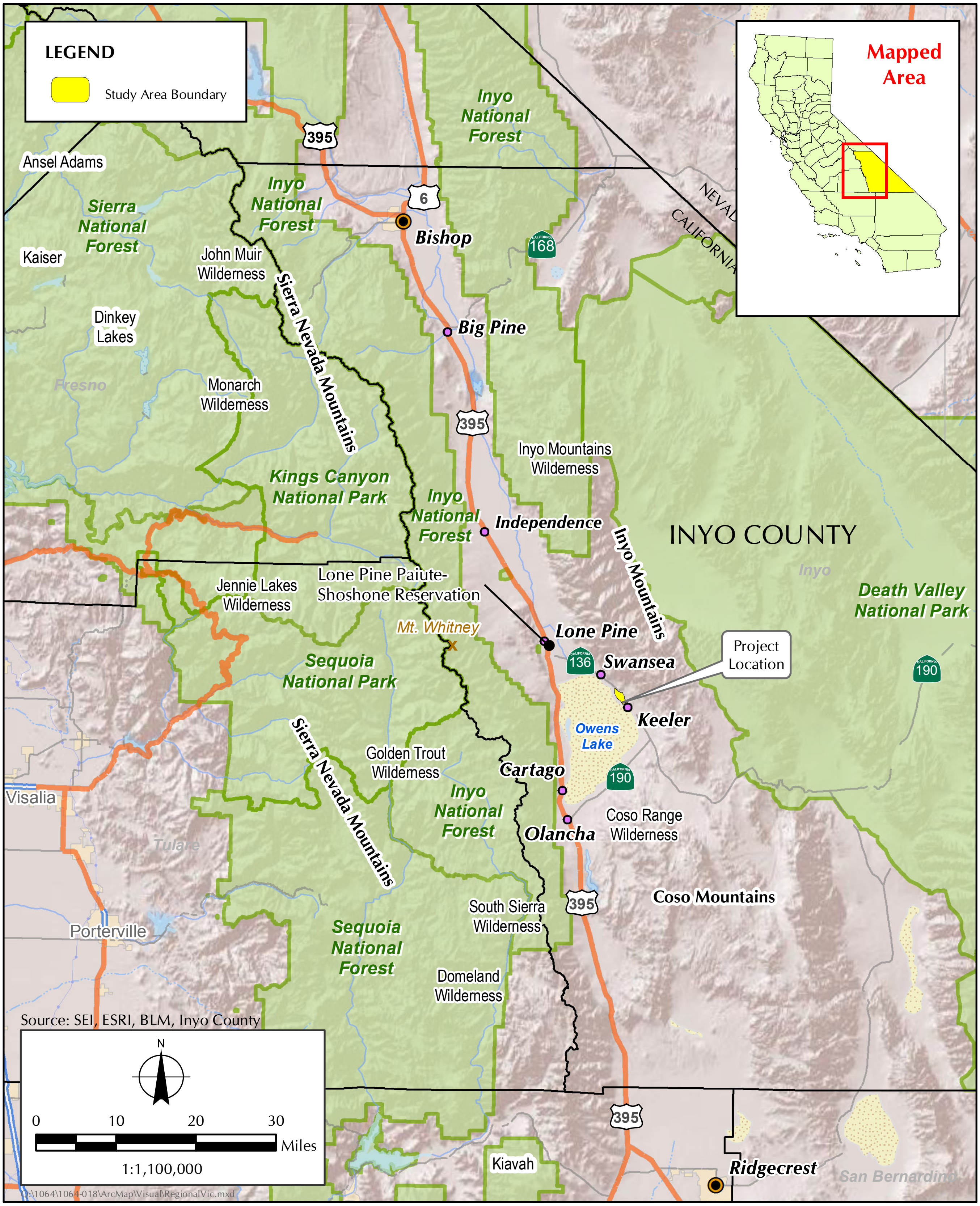

FIGURE 2.1-1
Regional Vicinity Map

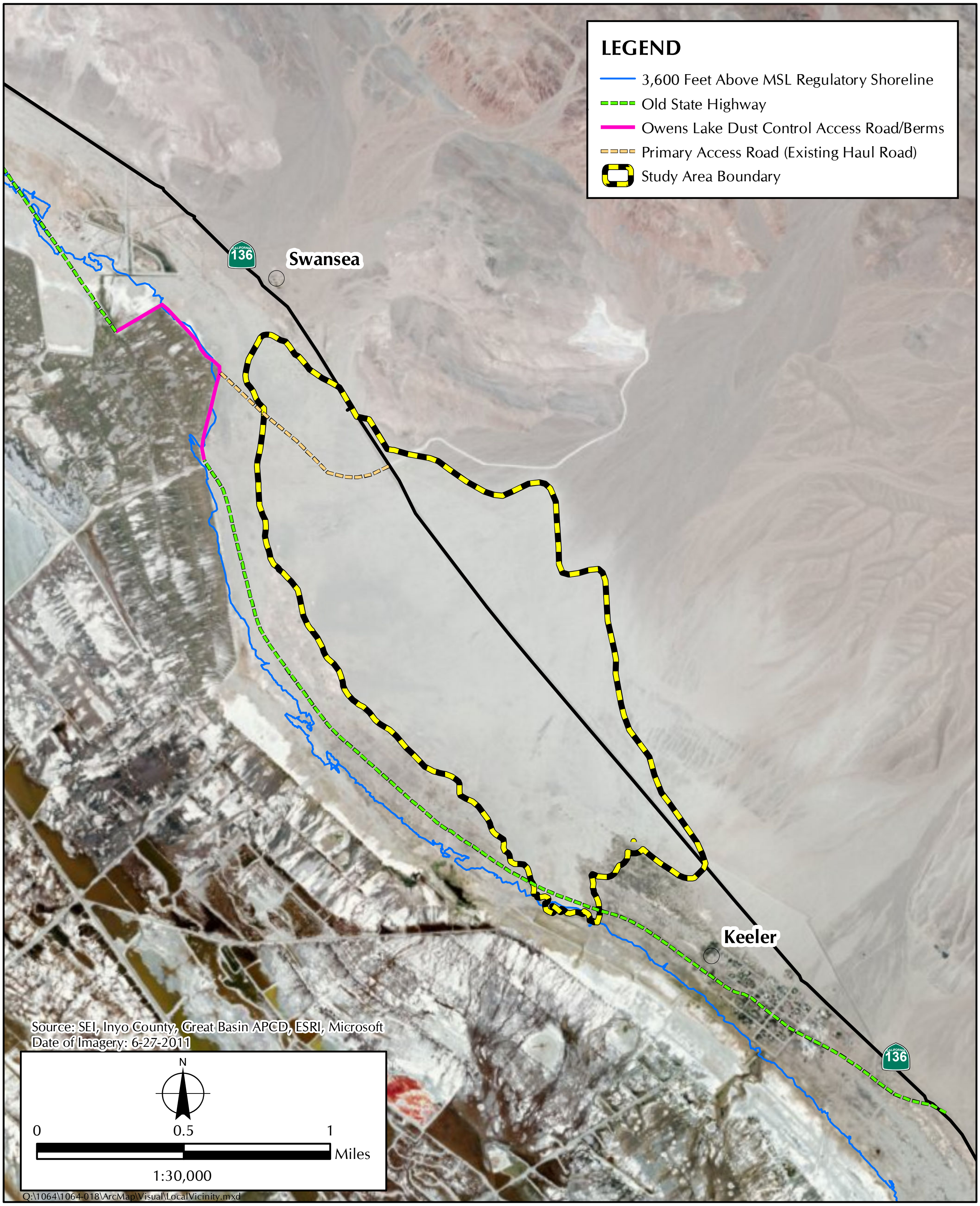

FIGURE 2.1-2

Project Location Map

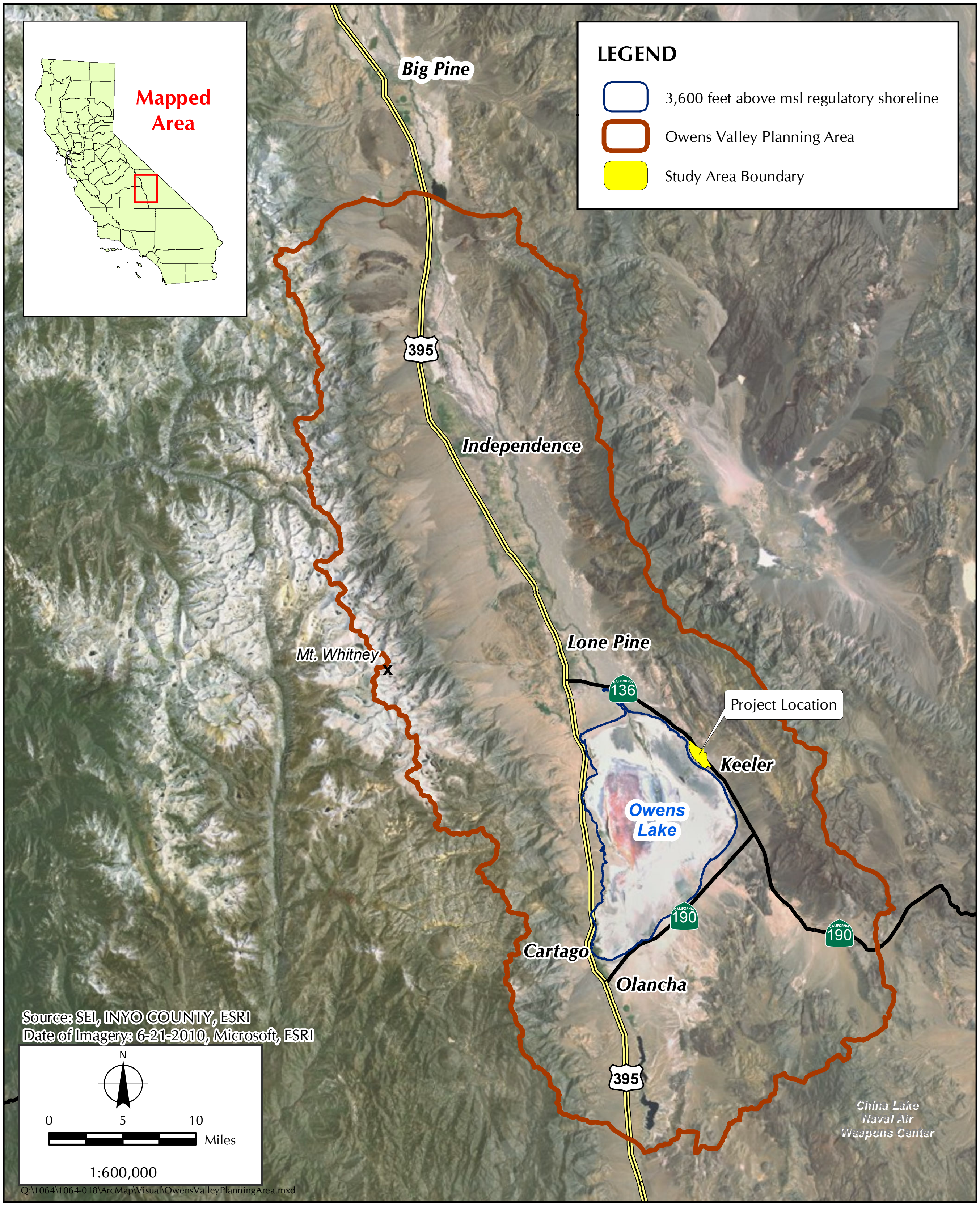

FIGURE 2.1-3

Proposed Project in Relation to Owens Valley Planning Area

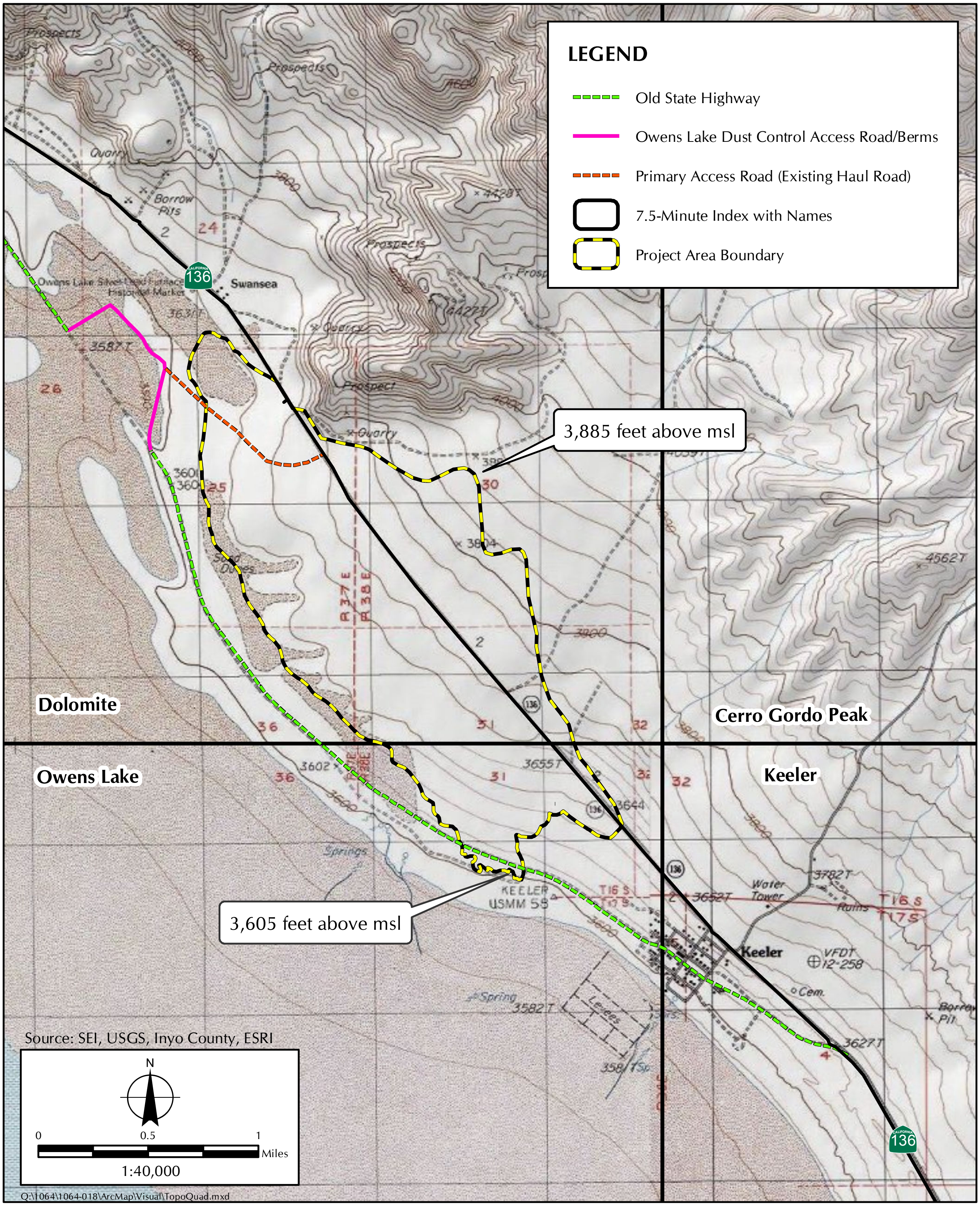

FIGURE 2.1-4

Topographic Map of Project Study Area
with USGS 7.5-Minute Quadrangle Index

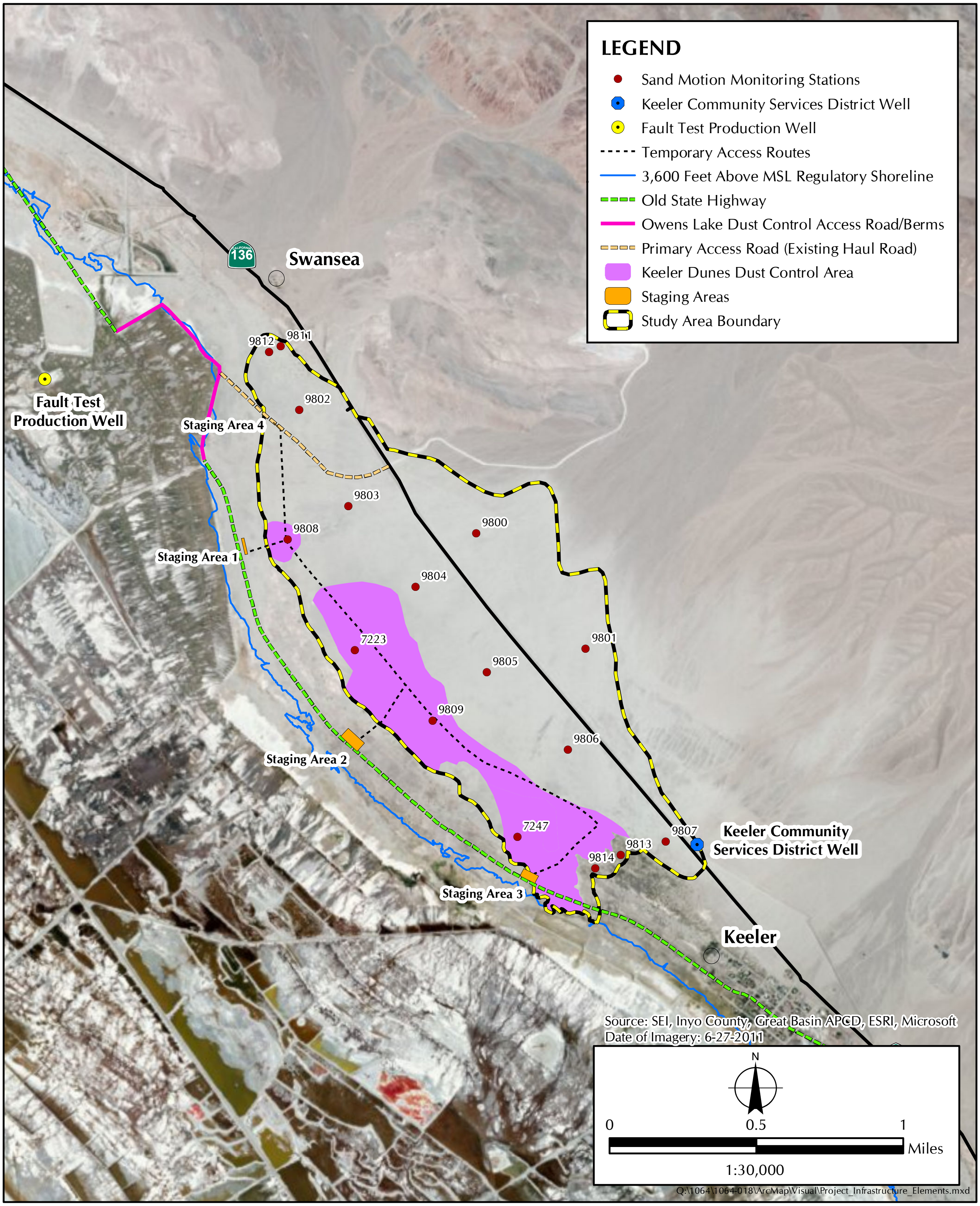

FIGURE 2.2.1-1

Location of Infrastructure Elements
Common to All Action Alternatives

acres) and 95 percent (177 acres) dust control efficiency (Figure 2.2.1-1, *Location of Infrastructure Elements Common to All Action Alternatives*). A random pattern would be used for straw bale placement, to mimic natural vegetation patterns. *Atriplex polycarpa* and a mixture of other types of native vegetation will be planted. Initially, the dust control reduction will be achieved through the array of straw bales. Over time, dust control will be taken over by the plants as they grow and mature. In addition, the straw bales provide a protected environment for the plants. Periodic watering of the plants in the springtime (March) may be needed in low-rainfall years for up to 3 years until the vegetation is sufficiently established. The long-term goal of this DCM would be the establishment of a self-sustaining native vegetation cover to control dust with minimal long-term maintenance. Continued air monitoring would be required, and minimal long-term maintenance would be anticipated.

Other infrastructure elements include temporary access routes; temporary staging areas for equipment, straw bales, and plants; and an effectiveness monitoring program (existing air monitoring stations). The estimated time period for construction is approximately 11 months. Supplemental watering, if necessary, would be conducted in late winter / early spring and late summer / early fall and would require approximately 1 to 3 months to complete. More specific details of the proposed project / proposed action elements are detailed below.

Native Vegetation

This DCM involves the establishment of a mix of native vegetation within the dust emitting areas shown on Figure 2.2.1-1. The goal would be to create a natural vegetated dune environment, similar to the existing Swansea Dunes (located to the northeast) and other stable shoreline dunes in the region (Swansea, California) that would act to prevent high emissions of dust by breaking up the wind and lowering the wind speed at the surface (Figure 2.2.1-2, *Example of Stabilized Dune at Swansea, California*). The approximate number of plants and straw bales necessary to achieve an estimated 85 and 95 percent dust control efficiency is summarized in Table 2.2.1-1, *Dust Control Measure Elements*. Examples of native vegetation that may be planted at the dunes are shown in Table 2.2.1-2, *Native Vegetation List*.

TABLE 2.2.1-1
DUST CONTROL MEASURE ELEMENTS

Element	Minimum Control Efficiency (%)	Number of Acres	No. Required per Acre	Total No. Required
Native Vegetation (ATPO)*	95	177	1,983	350,991
Native Vegetation (ATPO)	85	17	1,092	18,564
Total ATPO				369,555
Straw Bales**	95	177	661	116,997
Straw Bales	85	17	365	6,188
Total Bales				123,185

NOTES: * *Atriplex polycarpa* ** The dimensions of the straw bales are 0.6 x 0.4 x 1.17 meters (2.0 x 1.3 x 3.8 feet, or 24 x 16 x 48 inches).

TABLE 2.2.1-2
NATIVE VEGETATION LIST

Scientific Name	Common Name	Form
Atriplex polycarpa	Cattle spinach, cattle saltbush	Shrub
Atriplex confertifolia	Shadscale saltbush	Shrub
Atriplex parryi	Parry's saltbush	Shrub
Atriplex phyllostegia	Arrowscale	Annual herb
Cleomella obtusifolia	Mojave stinkweed, Mojave cleomella	Annual herb
Cleome sparsifolia	Fewleaf cleome, fewleaf spiderflower	Annual herb
Psathyrotes ramoissima	Turtleback	Annual or perennial herb
Sarcobatus vermiculatus	Greasewood	Shrub
Suaeda moquinii	Inkweed, Mojave seablite	Perennial herb/subshrub

Atriplex polycarpa (ATPO) (66 percent) and a mixture of other types of native vegetation (33 percent) will be planted. Native plants will be cultivated in a nursery and will be approximately 15 centimeters (5.9 inches) in height. Planting will involve initial placement of a straw bale (see Other Elements, below) followed by installation of native plants along the base of the straw bale. In addition, seeds of native plants will be dispersed in open areas between the straw bales.

It is expected that supplemental watering may be provided to the plants during the first 3 years of the proposed project / proposed action when rainfall is less than 50 percent of the average annual rainfall or is needed based on poor plant health. During the first year of the proposed project / proposed action, the plants may be provided with supplemental water, if needed, in the springtime when they are breaking dormancy for the growing season and again in the late summer as they go into their late season growth spurt. A decision to provide supplemental water will be based on the precipitation and the overall health of the plants.

During each of the first, second, and third years of operation of the proposed project / proposed action, there may be up to two supplemental watering events. The decision to provide supplemental water will be based on the precipitation during the year and the overall health of the plants. The potential watering events will occur in the later winter / early spring and late summer/early fall.

Straw Bales

This is a temporary element of the DCM that would be used to stabilize emissive dust areas and provide a sheltered environment for plants during establishment. The proposed project / proposed action will utilize straw bales (24 x 16 x 48 inches or similar size) installed in an irregular pattern across the emissive areas. Table 2.2.1-1 provides the number of straw bales necessary for 85 and 95 percent dust control. All straw bales used at the dunes would be certified weed free to minimize the threat from invasive weeds. Straw bales are anticipated to degrade over a period of several years and would provide organic material to the existing soil. Limited maintenance of straw bales (replacement of broken bales) is anticipated.

FIGURE 2.2.1-2
Example of Stabilized Dune at Swansea, California

Other Elements

Other proposed project / proposed action elements include infrastructure elements that may consist of access routes; staging areas; water supply, conveyance, and distribution facilities; and an effectiveness monitoring program.

Staging Areas

Temporary staging areas will be established to provide contractor(s) with storage and placement of equipment and straw bales, native plants, and supplies. Several staging area(s) will be provided on land near the revegetation locations (Figure 2.2.1-1). The total area of the proposed staging areas is approximately 3.2 acres that would be in place for 3 years following the installation of the revegetation program and then decommissioned.

One main staging area (Staging Area 1) will be established within the northwestern edge of the proposed project / proposed action area on land administered by the BLM (Figure 2.2.1-1). Located immediately east of Old State Highway, the facility will measure 50 feet by 300 feet in area and will be used by the contractor(s) for the storage of equipment, fuel, all-terrain vehicles (ATVs), native plants, and other supplies.

Staging Area 2 will also be constructed for the proposed project / proposed action along the Old State Highway, on land managed by the LADWP (Figure 2.2.1-1). Staging Area 2 will measure 200 feet by 400 feet.

Staging Area 3 will be located on land managed by the BLM, and will measure 150 feet by 300 feet. Both of these areas will be used for the temporary storage of equipment and materials needed for DCMs in the central and southern portions of the proposed project / proposed action area.

Staging Area 4 will be established adjacent to the gravel haul road constructed by the LADWP for dust mitigation on the Owens Lake, adjacent to the turn-off onto SR 136 (Figure 2.2.1-1). This staging area will be placed on previously disturbed land within the graveled limits of the existing road; thus, no vegetative removal is necessary. The area will measure approximately 10 feet by 200 feet and will be used primarily for temporary straw bale storage.

Staging Areas 1, 2, and 3 will require the brushing and grubbing, which leaves the vegetation roots intact within the ground and avoids the greater visual impact of grading. These staging areas will be restored and revegetated after the proposed project / proposed action has been completed.

Access Routes

A temporary access route for ATV travel will be constructed for use during placement of straw bales, planting, and watering activities. The temporary access route will be constructed without the use of supplemental materials such as asphalt or gravel. Following completion of planting and watering activities, the temporary access route will be restored utilizing straw bales and native plants as for the dust control areas of the proposed project / proposed action. The temporary access route from the staging areas will be approximately 13,478 feet long (2.5 miles), 20 feet wide, and even with the existing grade (the total temporary route disturbance area is 6 acres). The approximate location of access routes is shown in Figure 2.2.1-1. Currently, the proposed project / proposed action area can be accessed from State Route 136 and from Old State Highway (the Keeler Dump Road).

Water Supply, Conveyance, and Distribution

Approximately 5 gallons of water will be applied under each straw bale prior to planting the ATPO.[3] Total water needs for the ATPO are expected to be approximately 3.02 acre-feet (985,480 gallons). It is expected that supplemental watering will be implemented when rainfall is less than 50 percent of the average annual rainfall during the first 3 years until plants are well established.

The proposed project / proposed action assumes that the water for plant irrigation will be supplied from the District's 12-inch production well, located at the Fault Test Site, located about 0.7 mile northwest of the proposed project / proposed action boundary (Figure 2.2.1-3, *Water Supply*). The Fault Test well is an artesian (flowing) well and is capable of producing 250 gallons per minute (gpm).[4] An initial application of water at each straw bale installed in the dust control areas is expected to require approximately 615,925 gallons, which would be applied over a 2- to 4-month period. The Fault Test production well can supply 120,000 gallons over an 8-hour period, almost 8 times more than would be needed per day of watering. Other available water sources include the District's River Wells or purchased water from the Keeler Community Services District Well or the Agrarian Wells, located approximately 1 mile north-northeast from the project area.[5]

Water will be transported to the proposed project / proposed action via water trucks that will park at Staging Areas 1, 2, and 3, and transferred to small 150- to 200-gallon water tanks mounted to all-terrain vehicles (ATVs). Temporary standard piping, water storage tanks, and possible water pumping equipment may be required for the proposed project / proposed action. Subsequent distribution to individual plants in the proposed project / proposed action would be conducted through hoses from smaller water tanks mounted on a trailer and pulled with an ATV transported to the dust control areas via the access route or alternative temporary irrigation distribution system.

Effectiveness Monitoring Program

The District is currently monitoring dust activity in the proposed project / proposed action area with a network of 16 sand motion monitoring sites. The monitoring program will continue to operate during and after DCM implementation.

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[3] Groeneveld, D.P. HydroBio Advanced Remote Sensing. 12 September 2012. Telephone conversation with Donna Grotzinger, Sapphos Environmental, Inc., Pasadena, CA.

[4] Holder, G., Great Basin Unified Air Pollution Control District, Bishop, CA. 9 October 2012. Telephone conversation with D. Grotzinger, Sapphos Environmental, Inc., Pasadena, CA.

[5] Holder, G., Great Basin Unified Air Pollution Control District, Bishop, CA. 20 September 2013. Email to Eric Charlton, Sapphos Environmental, Inc., Pasadena, CA.

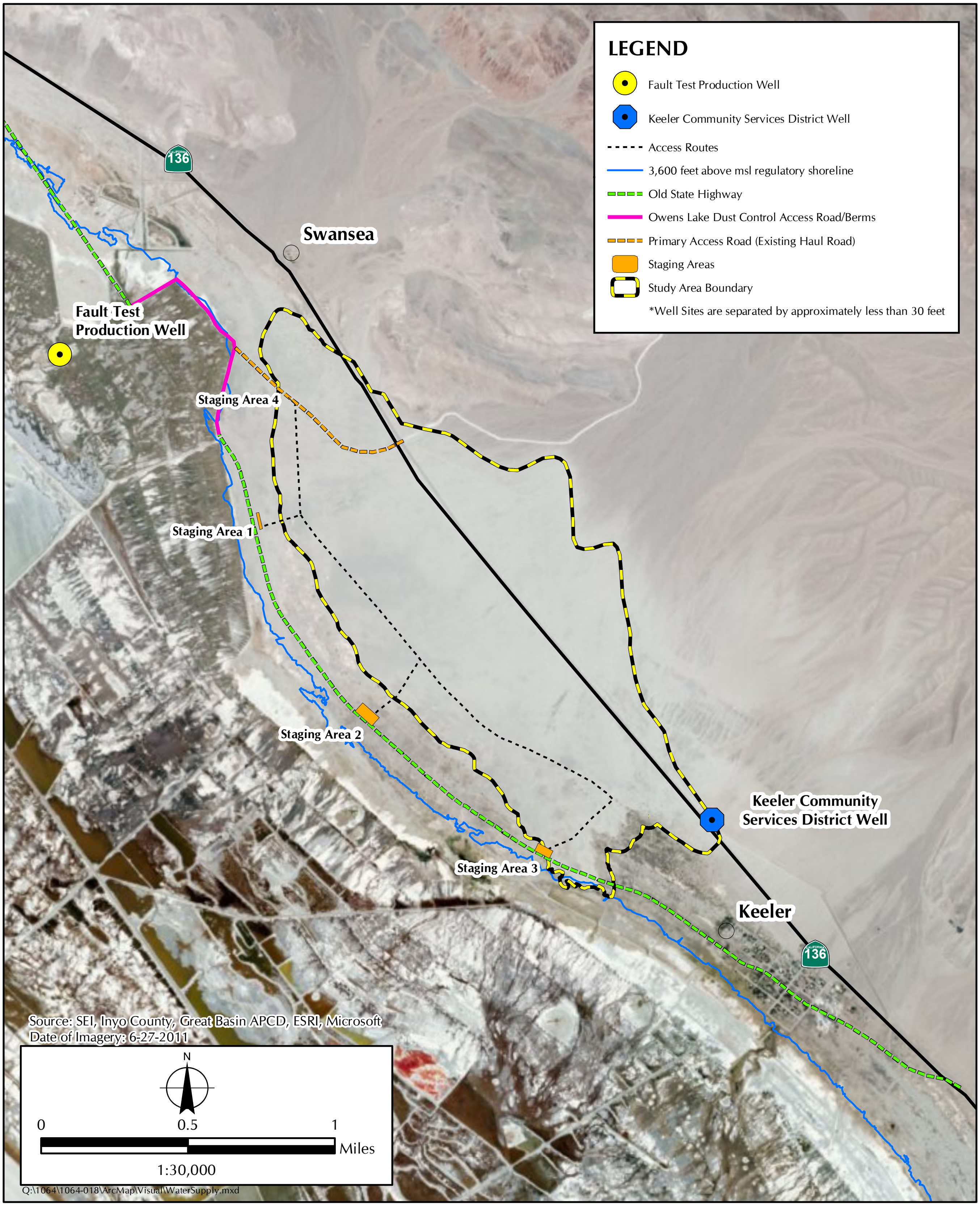

FIGURE 2.2.1-3

Water Supply

SECTION 3.0
METHODS

3.1 METHODS FOR CHARACTERIZING VISUAL RESOURCES

The visual resources technical approach utilizes the BLM's Visual Resource Contrast Rating (VRCR) system for BLM-administered public lands. This methodology utilizes field analysis, photo-documentation, viewshed mapping, and visual simulation techniques.

The factors considered for visual resources include: (1) scenic quality of the proposed project / proposed action site and vicinity; (2) available visual access and visibility, frequency, and duration that the landscape is viewed; (3) viewing conditions and how the proposed project / proposed action would dominate the view of the observer; (4) resulting contrast (form, line, color, and texture) of the proposed project / proposed action; (5) the extent to which the proposed project / proposed action would block views of the existing landscape features; and (6) the level of public interest in the existing landscape characteristics and concern over potential changes.

Visual simulations are used to produce simulations of implementation of the proposed project / proposed action, as seen from several key observation points (KOPs) that are selected in coordination with BLM.[1,2]

3.1.1 Bureau of Land Management Visual Resources Management

As part of its resource planning efforts, the BLM conducts an inventory and analysis of scenic values of the public lands it administers in order to establish objectives for the management of activities that may affect visual resources located on those lands. Only activities that occur on BLM-administered property are subject to the management objectives related to designated Visual Resource Management (VRM) methodology and the VRCR system. The VRM and VRCR system involves inventorying scenic values and establishing management objectives for those values through the resource management planning process, and then evaluating proposed activities to determine whether those actions would conform to the management objectives.[3] This process helps to ensure that the actions taken on public lands today will benefit the landscape and adjacent communities in the future. Proposed changes to public lands are evaluated based on BLM's VRM manual[4] and VRCR manual.[5] The VRM system evaluates visual resources impacts to BLM lands by classifying scenic quality, viewer sensitivity, and distance into one of four categories (Class I, II, III, or IV), with Class I having the highest visual sensitivity and Class IV having the least sensitivity.[6]

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[1] Primosch, Lawrence R., Bureau of Land Management, Bishop Field Office, Bishop, CA. 24 April 2012. Project Site Visit with Grace Holders, Great Basin Unified Air Pollution District, Bishop, CA., and David Lee and Leanna Guillermo, Sapphos Environmental, Inc., Pasadena, CA.

[2] Primosch, Lawrence R., Bureau of Land Management, Bishop Field Office, Bishop, CA. 11 April 2012. Conference Call with Laura Kaufman, Donna Grotzinger, and Leanna Guillermo, Sapphos Environmental, Inc., Pasadena, CA.

[3] Bureau of Land Management. n.d. *Visual Resources Management*. Manual 8400. Washington, DC: U.S. Department of the Interior. Available at: http://www.blm.gov/nstc/VRM/8400.html

[4] Bureau of Land Management. n.d. *Visual Resources Management*. Manual 8400. Washington, DC: U.S. Department of the Interior. Available at: http://www.blm.gov/nstc/VRM/8400.html

[5] Bureau of Land Management. n.d. *Visual Resource Contrast Rating*. Manual 8431. Washington, DC: U.S. Department of the Interior. Available at: http://www.blm.gov/nstc/VRM/8431.html

[6] Bureau of Land Management. n.d. *VRM System*. Washington, DC: U.S. Department of the Interior. Available at: http://www.blm.gov/nstc/VRM/vrmsys.html

Class I is assigned to those areas where a management decision has been made previously to maintain a natural landscape. This includes areas such as national wilderness areas, the wild section of national wild and scenic rivers, and other congressionally and administratively designated areas. Classes II, III, and IV are assigned based on a combination of scenic quality, sensitivity level, and distance zones.[7] The following lists the BLM objectives for each class:

- **Class I Objective:** The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

- **Class II Objective:** The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

- **Class III Objective:** The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

- **Class IV Objective:** The objective of this class is to provide for management activities that require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.[8]

VRM classifications are designated through BLM land use plans and resource management plans; however, if VRM classifications are not established for an area, then the local BLM office will establish an interim VRM classification on an action-by-action basis. The proposed action property VRM classification is Class III.[9] The classifications indicate the relative visual value of the resource itself, where (as described above) Classes I and II are the most valued, Class III represents a moderate value, and Class IV is of least value. The process involves rating the visual appeal of a tract of land, measuring public concern for scenic quality, and determining whether the tract of land is visible from travel routes or observation points.[10] Therefore, a Visual Resources Inventory (VRI) Summary was included in this technical appendix.

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[7] Bureau of Land Management. n.d. *Visual Resources Inventory*. Manual H-8410-1. Washington, DC: U.S. Department of the Interior. Available at: http://www.blm.gov/nstc/VRM/8410.html

[8] Bureau of Land Management. n.d. *Visual Resources Inventory*. Manual H-8410-1. Washington, DC: U.S. Department of the Interior. Available at: http://www.blm.gov/nstc/VRM/8410.html

[9] Primosch, Lawrence R., Bureau of Land Management, Bishop Field Office, Bishop, CA. 11 April 2012. Conference Call with Laura Kaufman, Donna Grotzinger, and Leanna Guillermo, Sapphos Environmental, Inc., Pasadena, CA.

[10] Bureau of Land Management. n.d. *Visual Resources Inventory*. Manual H-8410-1. Washington, DC: U.S. Department of the Interior. Available at: http://www.blm.gov/nstc/VRM/8410.html

BLM Visual Resource Management Visual Resource Contrast Rating System Approach

The BLM's VRM classification rating policy contains three primary elements:

- **Determining Resource Values:** The primary means to establish visual resource values is through a VRI that results in the assignment of one of four VRI Classes (I to IV). VRI Class I is reserved for special congressional designations or administrative decisions such as wilderness areas, visually sensitive areas of critical environmental concern (ACECs), or wild and scenic rivers, and so forth. VRI Classes II through IV are determined through a systematic process that documents the landscape's scenic quality, public sensitivity, and visibility. Rating units for each of the three factors are mapped individually, evaluated, and then combined through an overlayering analysis. The factors contributing to the VRI Class determination are described below.

  - Scenic quality
  - Sensitivity
  - Distance zones
  - Visual contrast ratings

  These factors are then analyzed to determine the applicable VRI Class. VRI Classes are informational in nature and provide the baseline for existing conditions. They do not establish management direction and should not be used as a basis for constraining or encouraging surface disturbing activities.

- **Establishing Management Objectives:** VRM Classes are determined through careful consideration of the VRI Summary (visual values), land use and demands, and the resource allocations and/or management decisions made in the applicable land use plan for a given area. VRM Class designations set the level of visual change to the landscape that may be permitted for any surface-disturbing activity. The objective of VRM Class I is to preserve the character of the landscape, whereas VRM Class IV provides for activities that require major modification to the landscape. VRI Classes are not intended to automatically become VRM Class designations. VRM Classes may be different from the VRI Classes assigned during the inventory, as the former should reflect a balance between the protection of visual values and other resource use needs. For example, an area with a VRI Class II designation may be assigned a VRM Class IV designation, based on its overriding value for mineral resource extraction or its designation as a utility corridor.

- **Evaluating Conformance:** Finally, proposed plans of development are evaluated for conformance to the VRM Class objectives through the use of the Visual Resource Contrast Rating process set forth within the BLM Handbook 8431-1.[11]

[11] Bureau of Land Management. n.d. *Visual Resource Contrast Rating*. Manual 8431. Washington, DC: U.S. Department of the Interior. Available at: http://www.blm.gov/nstc/VRM/8431.html

3.2 VISUAL RESOURCES INVENTORY ASSUMPTIONS AND DEFINITIONS

VRI determination is based on an assessment of four factors: scenic quality, sensitivity, distance zones, and visual contrast ratings. KOPs were selected by BLM for use as locations from which to assess the proposed project / proposed action's impacts with regard to these four factors.

The proposed project / proposed action area for visual resources is defined by the on-site landscapes directly affected by the various components of the proposed project / proposed action and the surrounding off-site area from which the proposed project / proposed action may be visible. A viewshed is defined as a surface area visible from a particular location or a linear location (a road or trail).The proposed project / proposed action site is 194 acres within the dust control measure study area. Viewshed maps, prepared by the District's consultants, are enclosed in this report.

3.2.1 Key Observation Points

KOPs are representative viewpoints for proposed project / proposed action visual impacts and mitigation measures. KOPs were generally selected to be representative of the most critical locations from which the proposed project / proposed action would be seen. The KOPs and their locations for the proposed action were selected by BLM (see Figure 4.2.1-1, *Key Observation Point Index Map*).[12]

3.2.2 Scenic Quality

Scenic quality is defined as "a measure of the visual appeal of a tract of land."[13] The highest scenic quality ratings are assigned to landscapes that have the most variety and most harmonious composition in relation to the natural landscape. Scenic quality can be used to describe the existing conditions, the standard for management, or the desired future conditions. For this analysis, the BLM's VRM resource inventory method was used, which allows the various landscape elements that make up scenic quality to be quantified and rated, with a minimum of ambiguity or subjectivity. In the BLM's visual resource inventory process, lands are given an A, B, or C rating based on the apparent scenic quality, which is determined using seven key factors (landscape features): landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications. These landscape features were rated numerically on a comparative basis with similar features within the viewshed, and a total score of scenic quality was tabulated. A total of 32 points is possible according to the rating scheme. View scores are:

- 19 points or more (Class A): Exceptional or an overall very high scenic quality rating, defined as rare, or unique;[14]

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[12] Primosch, Lawrence R., Bureau of Land Management, Bishop Field Office, Bishop, CA. 24 April 2012. Proposed Project Site Visit with Grace Holders, Great Basin Unified Air Pollution District, Bishop, CA., and David Lee and Leanna Guillermo, Sapphos Environmental, Inc., Pasadena, CA.

[13] Bureau of Land Management. n.d. *Visual Resources Inventory*. Manual H-8410-1. Washington, DC: U.S. Department of the Interior. Available at: http://www.blm.gov/nstc/VRM/8410.html

[14] A very high scenic quality rating can be composed of any mixture of the elements ratings listed above. For example, a project may receive a high scenic quality rating if the landform is deemed to be a 5 (high), there is substantial amount of water (lake, streams) present, and the vegetation is unique and rare; whereas another site might receive a high scenic quality rating because of the cultural modification, the scarcity of the view, and the color palette within the view.

- 12–18 points (Class B): Representative scenic quality and an overall high level of scenic quality rating, defined as landscapes that have visual qualities typically seen; and

- 11 points or fewer (Class C): Common or indistinctive and average to low scenic quality rating, defined as landscapes lacking visual diversity or features.

These ratings are delineated on a basis of like physiographic characteristics; similar visual patterns, such as texture, color, and variety; and areas that have similar impacts from human-made modifications.[15] The rating system of each of the seven categories (landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications) is given on a scale of 0 to 5, where a 0 rating is the lowest (or least impact) and a 5 rating is the highest. The view scores constitute one of the elements used by the BLM to assist in determining the VRI index or classification. Under BLM methodology (for unclassified BLM-administered lands), scenic quality is determined by the score and/or ratings the proposed action receives when evaluated by the criteria on BLM Form 8400-1, Scenic Quality Field Inventory, that is completed for each KOP; and Form 8400-5, Scenic Quality Rating Summary, that summarizes the findings in each Form 8400-1.

3.2.3 Sensitivity

The sensitivity level is a measure of public sensitivity toward the scenic value of an area. The sensitivity level within the proposed action area was determined following methods described in BLM Manual H-8410.[16] Sensitivity levels are a measure of public concern for scenic quality. Public lands are assigned high, medium, or low sensitivity levels by analyzing the various indicators of public concern. Following BLM's methodology, the components below were evaluated and given a ranking of high to low:

- **Type of User:** Visual sensitivity will vary with the type of users. Recreational sightseers may be highly sensitive to any changes in visual quality, whereas workers who pass through the area on a regular basis may not be as sensitive to change.

- **Amount of Use:** Areas seen by and used by large numbers of people are potentially more sensitive. Protection of visual values usually becomes more important as the number of viewers increases.

- **Public Interest:** The visual quality of an area may be of concern to local, state, or national groups. Indicators of this concern are usually expressed in public meetings, letters, newspaper or magazine articles, newsletters, land-use plans, and so forth. Public controversy created in response to proposed activities that would change the landscape character should also be considered.

- **Adjacent Land Use:** The interrelationship with land uses in adjacent lands can affect the visual sensitivity of an area. For example, an area within the viewshed of a residential area may be very sensitive, whereas an area surrounded by commercially developed lands may not be visually sensitive.

[15] Bureau of Land Management. n.d. *Visual Resources Inventory*. Manual H-8410-1. Washington, DC: U.S. Department of the Interior. Available at: http://www.blm.gov/nstc/VRM/8410.html

[16] Bureau of Land Management. n.d. *Visual Resources Inventory*. Manual H-8410-1. Washington, DC: U.S. Department of the Interior. Available at: http://www.blm.gov/nstc/VRM/8410.html

- **Special Management Areas:** Management objectives for special areas such as natural areas, wilderness areas or wilderness study areas, wild and scenic rivers, scenic roads or trails, and areas of critical environmental concern (ACEC) frequently require special consideration for the protection of visual values. This does not necessarily mean that these areas are scenic, but, that one of the management objectives may be to preserve the natural landscape setting. The management objectives for these areas may be used as a basis for assigning sensitivity levels.[17]

As noted in BLM Manual 8410, "There is no standard procedure for delineating Sensitivity Level Rating Units (SLRUs). The boundaries will depend on the factor that is driving the sensitivity consideration."[18] Sensitivity levels range from medium/low to high/medium and are summarized in the BLM Form 8400-6, Sensitivity Level Rating Summary. For the purposes of determining VRM classifications, the higher overall rating of sensitivity level is used to calculate the appropriate classification.

3.2.4 Distance Zones

The BLM has subdivided landscapes into three distance categories, or zones, based on relative visibility from travel routes or observation points. The three zones are: foreground-middleground, background, and seldom seen. The foreground-middleground zone includes areas seen from highways, rivers, or other viewing locations, which are up to 3 to 5 miles away. Areas beyond the foreground-middleground zone and usually less than 15 miles away are in the background zone. Areas not seen as foreground-middleground or background (i.e., largely hidden from view) are in the seldom-seen zone.[19] Distance zones are typically delineated based on visibility, not a uniformly applied buffer. The proposed project / proposed action components (i.e., straw bales) create visibility potential for these components to foreground-middleground distances of 3 to 5 miles.

3.2.5 Visual Contrast Ratings

The basic philosophy underlying the visual contrast system is the degree to which an activity affects the visual quality of a landscape depends on the visual contrast created between a proposed project / proposed action and the existing landscape.[20] The contrast can be measured by comparing the proposed project / proposed action features with the major features in the existing landscape. The basic design elements of form, line, color, and texture are used to make this comparison and to describe the visual contrast created by the proposed project / proposed action. This assessment process provides a means for determining visual impacts and for identifying measures to mitigate these impacts.

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[17] Bureau of Land Management. n.d. *Visual Resources Inventory*. Manual H-8410-1. Washington, DC: U.S. Department of the Interior. Available at: http://www.blm.gov/nstc/VRM/8410.html

[18] Bureau of Land Management. n.d. *Visual Resources Inventory*. Manual H-8410-1. Washington, DC: U.S. Department of the Interior. Available at: http://www.blm.gov/nstc/VRM/8410.html

[19] Bureau of Land Management. n.d. *Visual Resources Inventory*. Manual H-8410-1. Washington, DC: U.S. Department of the Interior. Available at: http://www.blm.gov/nstc/VRM/8410.html

[20] Bureau of Land Management. n.d. *Visual Resource Contrast Rating*. Manual 8431. Washington, DC: U.S. Department of the Interior. Available at: http://www.blm.gov/nstc/VRM/8431.html

The visual contrast can be measured by comparing the proposed project / proposed action features with the major features in the existing landscape (Table 3.2.5-1, *BLM Degree of Contrast Criteria*). Each of the four categories was analyzed using a four-factor scale: strong, moderate, weak, or none on the BLM Form 8400-4, Visual Contrast Rating Worksheet (Appendix B, *Form 8400-4 Forms*).

TABLE 3.2.5-1
BLM DEGREE OF CONTRAST CRITERIA

Degree of Contrast	Definition
None	The element contrast is not visible or perceived.
Weak	The element contrast can be seen but does not attract attention.
Moderate	The element contrast begins to attract attention and begins to dominate the characteristic landscape.
Strong	The element contrast demands attention, will not be overlooked, and is dominant in the landscape.

SOURCE: Bureau of Land Management. n.d. *Visual Resource Contrast Rating*. Manual 8431. Washington, DC: U.S. Department of the Interior. Available at: http://www.blm.gov/nstc/VRM/8431.html

3.2.6 Visual Simulations

For the visual simulations, a Google Earth Keyhole Markup Language (KML) of the KOPs and control points was created. The dust control area of Owens Lake was added to the Google Earth KML as a translucent red shading. Three PDFs were created that correspond to the camera angles for KOPs 2 through 4 for the visibility simulation. Reference points were added to the PDFs and to the original photographs. The PDF and photographs were superimposed and transformed to align the reference points. The straw bales were then added to the corresponding areas. This analysis takes into account the height of the proposed project / proposed action components and the local and regional terrain. This analysis determines what portions of the proposed project / proposed action property are in visible range from the combined viewsheds of KOPs within and surrounding the proposed project / proposed action property. This analysis includes a graphic representation of those areas of the proposed project / proposed action that would be visible from the combined viewsheds of the KOPs.

This Visual Resource Inventory (VRI) Summary provides information regarding the existing visual characteristics of the proposed project / proposed action property and surrounding area. BLM visual resource methodologies (Section 3.0) were used to determine the consistency of the proposed action with any federal, state, regional, and local laws governing the regulations of aesthetic resources, including scenic resources, scenic highways, visual character, and light and glare, specifically the methodologies in the BLM's Visual Resource Management (VRM) policy and Visual Resource Contrast Rating (VRCR) system. This VRI Summary contains Key Observation Points (KOPs) that were selected in coordination with the BLM Bishop Field Office to evaluate the current status of the visual resources.[1]

4.1 BASELINE

The proposed project / proposed action is located immediately northwest of the community of Keeler in Inyo County, California. The proposed project / proposed action consists of dust control measures (DCMs) applied to 194 acres of land within an 870-acre (1.36-square-mile) study area. The proposed project / proposed action study area is bounded approximately by the Inyo Mountains on the east-northeast and the dry Owens Lake bed shoreline on the west-southwest, and extends approximately 2.5 miles to the northwest from the community of Keeler. California State Route (SR) 136 bisects the study area. The proposed project / proposed action is located on lands administered by the BLM Bishop Office and the LADWP. Other stakeholders include Inyo County, the local Lone Pine-Paiute Shoshone Tribes, Caltrans District 9, Southern Pacific Railroad, Keeler Community Services District, and Keeler residents.

The visual character of the proposed project / proposed action site includes the Keeler Dunes geologic feature, with the dry Owens Lake bed to the west, the nearby Inyo and White mountain ranges to the east, the more distant Coso mountain range to the south, and the Sierra Nevada range to the far west. Although the proposed project / proposed action site is uninhabited, the community of Keeler (population: 66) is located downwind and adjacent to the southern border of the site.[2] Residents of Keeler are known to use the Keeler Dunes for low-impact recreational activities, such as hiking and dog walking.[3] The proposed project / proposed action site may also be visible to outside recreationalists, such as birders, hikers, and visitors to the historic mining/smelter sites of Swansea and Cerro Gordo, as part of the viewshed from nearby recreational areas, such as the Lower Owens River/Lake area. Inyo County and LADWP are currently evaluating the potential opportunities and constraints with regard to existing recreational activities in the adjacent Lower Owens River/Lake area.

The nearest highways to the proposed project / proposed action site are SR 136, which bisects the study area, and SR 190, located south of the proposed project / proposed action site. SR 136 is not an officially designated state scenic highway. A segment of SR 190, approximately 23 miles from the

[1] Primosch, Lawrence R., Bureau of Land Management, Bishop Field Office, Bishop, CA. 24 April 2012. Proposed Project Site Visit with Grace Holders, Great Basin Unified Air Pollution District, Bishop, CA, and David Lee and Leanna Guillermo, Sapphos Environmental, Inc., Pasadena, CA.

[2] U.S. Census Bureau. 2010 Census. Washington, DC.

[3] Sapphos Environmental, Inc. 12 July 2011. Memorandum for the Record No. 1. Subject: Summary of the June 29, 2011, Project Kickoff Meeting for the Keeler Dunes Environmental Impact Report / Environmental Impact Statement. Pasadena, CA.

proposed project / proposed action site, is designated a state scenic highway near the entrance to Death Valley National Park.[1] However, the portion of SR 190 that is located near the proposed project / proposed action site is only an eligible, not designated, state scenic highway. SR 190 is located approximately 5 miles south of the community of Keeler and the proposed project / proposed action site is not likely to be visible to travelers on that highway.

The proposed project / proposed action site is visible from the vantage points of residents at Keeler, at the historic mining/smelter sites of Swansea and Cerro Gordo, recreationalists at the Lower Owens River/Lake area, and corridor users at SR 136.

4.1.1 Pilot Demonstration Test

The District is currently conducting a pilot study to validate the efficacy of using native vegetation to stabilize the dune complex and reduce emissivity, as well as to provide site-specific information that will be utilized for the final design of the proposed project / proposed action. Figure 4.1.1-1, *Pilot Demonstration Test Photographs*, demonstrates the visibility of the test site.

4.2 BLM VISUAL RESOURCES INVENTORY

The BLM VRI and VRCR were based on an assessment of scenic quality, sensitivity, distance zones, and visual contrast ratings. The project action's VRM classification is a Class III.[4] The objective of Class III is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities attract attention, but should not dominate the view of casual observers. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape. KOPs[5] and the existing Class III VRM classification for the proposed action and the surrounding area[6] were used for the proposed action to assess these factors.

4.2.1 Key Observation Points

KOPs were located based on their usefulness in evaluating existing landscapes and potential impacts on visual resources with various levels of sensitivity, in different terrain, and from various vantage points. Visual simulations were prepared from KOPs that were selected[7] at the most critical viewpoints, as determined by the BLM office.[8] The observation points were chosen to represent typical views of the proposed project / proposed action property from various directions and to find potential areas of most viewer sensitivity. These KOPs were used to evaluate potential sensitive viewpoints, potential scenic resources, and recreational resources. These observational points represent the views from corridor users at SR 136 and the community of Keeler within the

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[4] Primosch, Lawrence R., Bureau of Land Management, Bishop Field Office, Bishop, CA. 11 April 2012. Conference Call with Laura Kaufman, Donna Grotzinger, and Leanna Guillermo, Sapphos Environmental, Inc., Pasadena, CA.

[5] Selection of the KOPs was coordinated with the BLM Bishop Field Office. All KOP locations were approved during the site visit and photo documentation occurred.

[6] Primosch, Lawrence R., Bureau of Land Management, Bishop Field Office, Bishop, CA. 11 April 2012. Conference Call with Laura Kaufman, Donna Grotzinger, and Leanna Guillermo, Sapphos Environmental, Inc., Pasadena, CA.

[7] Selection of the KOPs was coordinated with the BLM Bishop Field Office. All KOP locations were approved during the site visit and photo documentation occurred.

[8] Primosch, Lawrence R., Bureau of Land Management, Bishop Field Office, Bishop, CA. 24 April 2012. Proposed Project Site Visit with Grace Holders, Great Basin Unified Air Pollution District, Bishop, CA, and David Lee and Leanna Guillermo, Sapphos Environmental, Inc., Pasadena, CA.

Pilot Demonstration Test Site
Altitude: 1,101 meters
3,612 feet

FIGURE 4.1.1-1
Pilot Demonstration Test Photographs

Old State Highway Looking Northeast at Test Site
View of Pilot Demonstration Test Site from approximately 951 feet southwest of Test Site on Old State Highway, Altitude: 3,599 feet

FIGURE 4.1.1-1
Pilot Demonstration Test Photographs

Inyo Mountains Looking Southwest at Test Site
View of Pilot Demonstration Test Site from approximately 4,600 feet northeast of Test Site on a ridge, Altitude: 4,278 feet

FIGURE 4.1.1-1
Pilot Demonstration Test Photographs

proposed project / proposed action vicinity. Geographic information system (GIS) coordinates where each existing condition photograph was taken were recorded (Table 4.2.1-1, *Key Observation Points*; and Figure 4.2.1-1, *Key Observation Point Index Map*). Type, amount of use, and level of public access of KOPs are reflected in BLM Form 8400-6 (Appendix C, *BLM 8400-6 Forms*). Four KOPs were used for the analysis of scenic quality, visual contrast, and sensitivity (Figure 4.2.1-1).

TABLE 4.2.1-1
KEY OBSERVATION POINTS

KOP ID	GIS Coordinate X	GIS Coordinate Y	Distance from Proposed Project / Proposed Action Area	Landscape Character
KOP 1	421321	4038764	0.5 mile (2,492 feet) southeast	A point KOP from the community of Keeler, representing a public gathering place, where the proposed project / proposed action would occupy the foreground
KOP 2	421270.7	4039446	0.2 mile (1,080 feet) east	A linear KOP along State Route 136, representing a public road, where the proposed project / proposed action would occupy the foreground
KOP 3	420415.9	4040433	Within the proposed project / proposed action boundary	A point KOP from the LADWP scenic overlook, representing viewers on LADWP point of interest overlooks; where the proposed project / proposed action would occupy the foreground
KOP 4	419672	4041418	0.03 mile (164 feet) east	A linear KOP along State Route 136; representing a public road, where the proposed project / proposed action would occupy the foreground

KEY: KOP = key observation point
GIS = geographic information system
LADWP = Los Angeles Department of Water and Power

Existing Visual Setting

Photographs were taken at each KOP inventory location as part of the visual impact assessment process, to identify the existing visual setting. Visual resources surveys of the proposed project / proposed action property were conducted in order to understand the existing visual resources in the vicinity of the proposed project / proposed action. BLM protocol forms and worksheets were completed for the proposed action to determine the level of contrast the proposed action would have on the existing visual resources. Then, based on the classification of the visual resources for the proposed action property, it was determined whether the visual resources management objectives for the proposed action property were met.

An interdisciplinary team of visual resource management practitioners from Sapphos Environmental, Inc. conducted a collaborative analysis of the landscape's scenic quality using a quantitative method adapted from the BLM's VRM methodology.[9,10,11] Photo documentation was conducted to document the existing conditions and provide a visual simulation of the proposed project / proposed action in operation from the three observation points. The KOPs have been analyzed as representations of the proposed project / proposed action area from potential areas of viewer sensitivity. Therefore, the ratings that are designated for the KOPs are also ratings designated for the proposed project / proposed action area.

Key Observation Point 1

This KOP provides a view toward the proposed project / proposed action area from the community of Keeler. This KOP illustrates little to no diversity in the landscape. Vegetation is low, sparse, simple, and indistinct under BLM definitions (Figure 4.2.1-2, *Observation Point 1*). The landform can be characterized as an expansive, relatively flat valley bottom. The foreground shows a low road, shrubs, native vegetation, dunes, and the Owens lake bed. The Owens lake bed can be viewed in the middleground, while the mountain ridgelines can be seen in the background.

Key Observation Point 2

This KOP provides a view from the paved SR 136. Vegetation is native, low, and simple in foreground. The dark grey, smooth, straight SR 136 can also be seen in the foreground. The landform is extremely coarse and relatively flat valley in the foreground, the Owens lake bed in the middleground, and the Sierra Nevada ridgeline occupies the background (Figure 4.2.1-3, *Observation Point 2*). The features of this KOP are coarse, with colors varying from the beige of the landform, green and tan of the vegetation, and blue and brown of the mountains.

Key Observation Point 3

This KOP was taken at the LADWP overlook for the Owens Lake dust control project / proposed action. The KOP illustrates flat land with minimal vertical relief in the foreground and middleground with the mountain ridgeline in the background (Figure 4.2.1-4, *Observation Point 3*). Vertical electrical transmission line poles are located less than 150 feet northwest of KOP 3 and visible in the foreground. The vegetation is low and scattered, consisting of native vegetation. The features of this KOP are coarse, with colors varying from the beige of the landform, green and tan of the vegetation, and blue and brown of the mountains. The Owens lake bed can be seen in the middleground. This view is very representative of typical landscapes found in this area.

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[9] BLM's visual resource management methodology is based on the BLM's Manual 8400—*Visual Resources Management* and BLM Manual 8431—*Visual Resource Contrast Rating* and the instructions found within each document.

[10] Bureau of Land Management. n.d. *Visual Resources Management*. Manual 8400. Washington, DC: U.S. Department of the Interior. Available at: http://www.blm.gov/nstc/VRM/8400.html

[11] Bureau of Land Management. n.d. *Visual Resource Contrast Rating*. Manual 8431. Washington, DC: U.S. Department of the Interior. Available at: http://www.blm.gov/nstc/VRM/8431.html

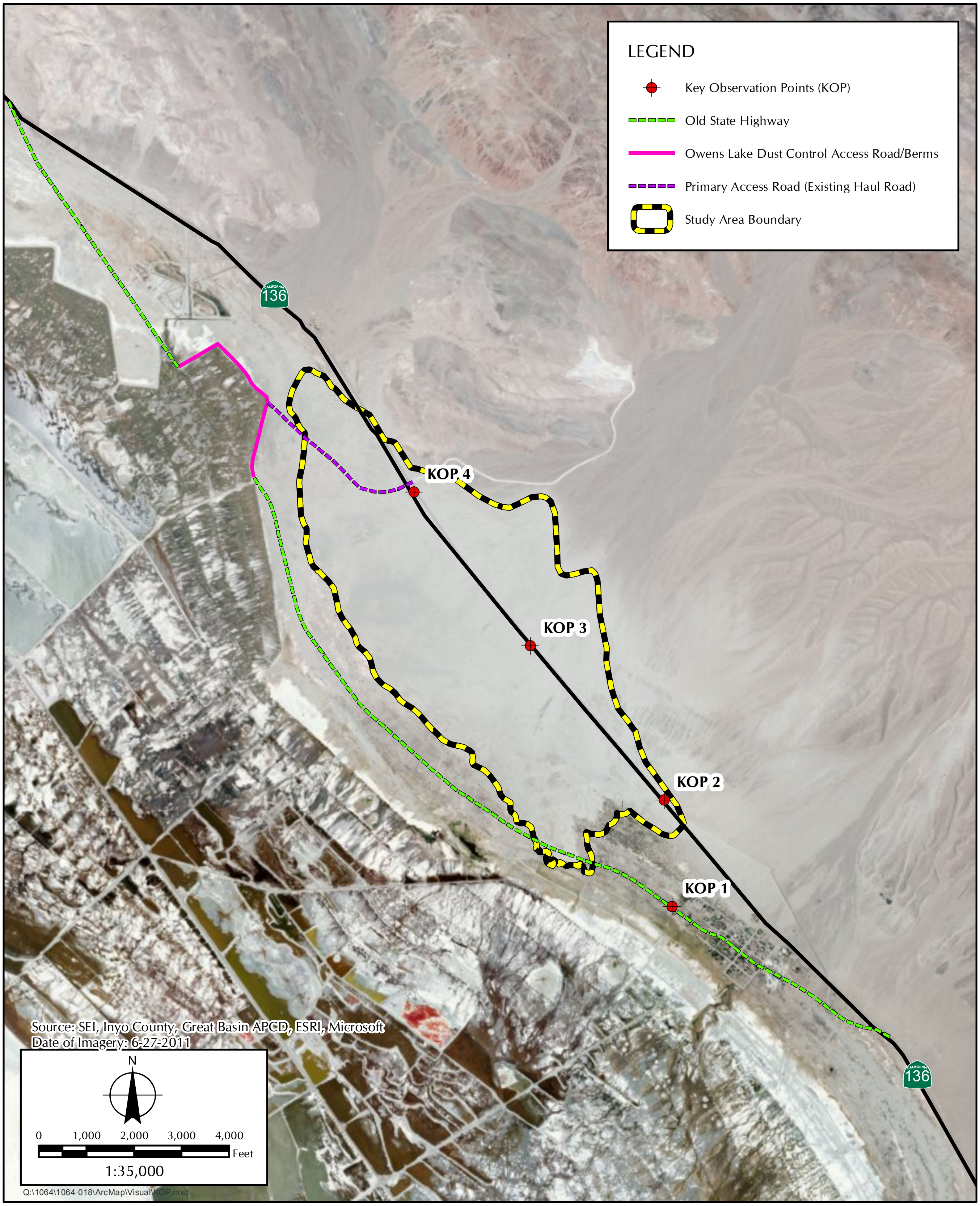

FIGURE 4.2.1-1

Key Observation Point Index Map

PHOTO 1
Existing Conditions

FIGURE 4.2.1-2
Observation Point 1

PHOTO 1
Existing Conditions

PHOTO 2
Visual Simulation

FIGURE 4.2.1-3
Observation Point 2

PHOTO 1
Existing Conditions

PHOTO 2
Visual Simulation

FIGURE 4.2.1-4
Observation Point 3

Key Observation Point 4

This KOP illustrates the vast flat, valley bottom in the foreground, the Owens lake bed in the middle ground, and the mountain ridgeline in the background (Figure 4.2.1-5, *Observation Point 4*). Vertical electrical transmission line poles can be seen in the foreground, along with the coarse, scattered, native vegetation. The view depicts a beige landform, green and tan vegetation, and dark blue and brown mountains. This view is very representative of typical landscapes found in this area.

Visual Simulation

For the visual simulations, a Google Earth Keyhole Markup Language (KML) of the KOPs and control points was created. The dust control area (proposed project / proposed action site) of the Owens Lake was added to the Google Earth KML as a translucent red shading. Three images, in portable document format (PDF) were created that correspond to the camera angles for KOPs 2, 3, and 4 for the visibility simulation. Reference points were added to the PDFs and to the original photographs. The PDF and photographs were superimposed and transformed to align the reference points. The straw bales were then added to the corresponding areas proposed for mitigation. A viewshed analysis determined what portions of the proposed project / proposed action site were within a visible range from the combined viewsheds of four key observation points within and surrounding the proposed project / proposed action property. The analysis includes a graphic representation of those areas of the proposed project / proposed action that would be visible from the combined viewsheds of the KOPs.

Key Observation Point 1

Under direction of the BLM Bishop Field Office, no visual simulation was created for this KOP due to the low visibility of the proposed project / proposed action components (straw bales) in the view.[12]

The additional straw bales for Alternatives 1 and 2 would have similar low visibility of straw bales to the proposed project / proposed action. The 20,000-gallon dark olive green painted water storage tanks at Staging Areas 2 and 3 under Alternative 3 would be barely visible from KOP 1 and occupy less than 1 percent of the foreground view. The white PVC irrigation lines under Alternative 3, 4, and 5 would be predominantly shielded from view by the dune topography and the straw bales and existing shrubs, with the small sections of visible irrigation lines perceived as portions of a line in the distance. The trunk lines leading from the roadside turnouts along SR 136 under Alternative 4 and the trunk line leading from the KCSD well to the white PVC irrigation lines under Alternative 5 would also be predominantly shielded from view by the dune topography and the straw bales and existing shrubs; due to their proximity to SR 136, they would be painted a beige/tan color to blend in with the colors of the existing environment for reduced visibility. KOP 1 is located approximately 4,000 feet southeast of the nearest proposed trunk line proposed under Alternative 4 and approximately 1,960 feet south of the proposed trunk line proposed under Alternative 5.

[12] Primosch, Lawrence R., Bureau of Land Management, Bishop Field Office, Bishop, CA. 24 April 2012. Proposed Project Site Visit with Grace Holders, Great Basin Unified Air Pollution District, Bishop, CA, and David Lee and Leanna Guillermo, Sapphos Environmental, Inc., Pasadena, CA.

Key Observation Point 2

The proposed project / proposed action would be visible from this vantage point in the foreground as it is less than 2 miles from the vantage point (Figure 4.2.1-3). The existing vegetation is tan in color. With project / proposed action implementation, the view from this point has tan-colored straw bales covering a portion of the previously beige valley bottom (Figure 4.2.1-3). From this view, the straw bales appear inter-mixed, blend in, and are compatible in the view with the existing vegetation because the straw bales and the existing, native vegetation are both tan in color and appear at similar heights. The other infrastructure elements (temporary access routes, temporary staging areas for equipment, and a water storage tank) are not visible from this vantage point and would appear intermixed within the existing visual setting. The proposed project / proposed action components are visible but mixed with the already existing vegetation in the foreground.

Similarly, the components of Alternatives 1 and 2, including additional straw bales, would be visible but intermixed with the existing vegetation in the foreground. The 20,000-gallon dark olive green painted water storage tanks at Staging Area 2 under Alternative 3 would be barely visible from KOP 2 and occupy less than 1 percent of the foreground view. The white PVC irrigation lines under Alternative 3, 4, and 5 would be predominantly shielded from view by the dune topography and the straw bales and existing shrubs, with the small sections of visible irrigation lines blending in with the reflective surface of other Owens Lake dust control measures in the distance. The trunk lines leading from the roadside turnouts along SR 136 under Alternative 4 and the trunk line leading from the KCSD well to the white PVC irrigation lines under Alternative 5 would also be predominantly shielded from view by the dune topography and the straw bales and existing shrubs; due to their proximity to SR 136, they would be painted a beige/tan color to blend in with the colors of the existing environment for further reduced visibility. KOP 2 is located approximately 2,400 feet southeast of the nearest trunk line proposed under Alternative 4 and approximately 210 feet north of the trunk line proposed under Alternative 5.

Key Observation Point 3

The visual simulation depicts the addition of the proposed project / proposed action features, with straw bales visible in horizontal lines within 2 miles of the vantage point (Figure 4.2.1-4). Therefore, the proposed project / proposed action components are visible in the foreground. The existing vegetation is tan and green in color, with the tan similar to the tan in the straw bales. The vegetation is coarsely scattered throughout the proposed project / proposed action site and surrounding area. The straw bales that are visible from this view point are tan and coarse; which are similar to the color and characteristics of the existing vegetation. From this view, the straw bales are of the same height and blend in and are compatible with the color of the existing, native vegetation. The other infrastructure proposed project / proposed action elements (temporary access routes, temporary staging areas for equipment, and a water storage tank) are not visible from this KOP and would appear intermixed within the existing visual setting. The proposed project / proposed action components are visible but mixed with the existing vegetation in the foreground.

Similarly, the components of Alternatives 1 and 2, including additional straw bales, would be visible but intermixed with the existing vegetation in the foreground. The 20,000-gallon dark olive green painted water storage tanks at Staging Areas 2 and 3 under Alternative 3 would be barely visible from KOP 3 and occupy less than 1 percent of the foreground view. The white PVC irrigation lines under Alternative 3, 4, and 5 would be predominantly shielded from view by the dune topography and the straw bales and existing shrubs, with the small sections of visible

PHOTO 1
Existing Conditions

PHOTO 2
Visual Simulation

FIGURE 4.2.1-5
Observation Point 4

irrigation lines blending in with the reflective surface of other Owens Lake dust control measures in the distance. The trunk lines leading from the roadside turnouts along SR 136 under Alternative 4 would also be predominantly shielded from view by the dune topography and the straw bales and existing shrubs; due to their proximity to SR 136, they would be painted a beige/tan color to blend in with the colors of the existing environment for further reduced visibility. Under Alternative 3, KOP 3 would periodically be used as a roadside turnout for water delivery trucks to connect to the aboveground irrigation system. The trunk line leading from the KCSD well to the white PVC irrigation lines under Alternative 5 would be located at least 3,500 feet southeast of KOP 3 and not be visible from this distance.

Key Observation Point 4

The proposed project / proposed action would be visible from this vantage point in the foreground as it is less than 2 miles of the vantage point (Figure 4.2.1-5). The straw bales from the proposed project / proposed action are visible in the center-right side of the photograph. The straw bales are a tan color and appear coarse in this vantage point. The existing vegetation is tan and green in color, with the tan similar to the tan in the straw bales. The vegetation is coarsely scattered throughout the proposed project / proposed action site and surrounding area. From this view, the straw bales are of the same height blend in and are compatible with the color of the existing, native vegetation. The other infrastructure proposed project / proposed action elements (temporary access routes, temporary staging areas for equipment, and a water storage tank) are not visible from this view point and would appear intermixed within the existing visual setting. The proposed project / proposed action components are visible but mixed with the already existing vegetation in the foreground.

Similarly, the components of Alternatives 1 and 2, including additional straw bales, would be visible but intermixed with the existing vegetation in the foreground. The 20,000-gallon dark olive green painted water storage tanks at Staging Area 1 under Alternative 3 would be barely visible from KOP 4 and occupy less than 1 percent of the foreground view. The white PVC irrigation lines under Alternative 3, 4, and 5 would be predominantly shielded from view by the dune topography and the straw bales and existing shrubs, with the small sections of visible irrigation lines blending in with the reflective surface of other Owens Lake dust control measures in the distance. The trunk lines leading from the roadside turnouts along SR 136 under Alternative 4 would be located approximately 620 feet southeast of KOP 4 at the nearest point and be predominantly shielded from view by the dune topography and the straw bales and existing shrubs; due to their proximity to SR 136, they would be painted a beige/tan color to blend in with the colors of the existing environment for further reduced visibility. The trunk line leading from the KCSD well to the white PVC irrigation lines under Alternative 5 would be located at least 1.4 miles southeast of KOP 4 and not be visible from this distance.

4.2.2 Scenic Quality

Under BLM methodology, scenic quality is determined by the score and or ratings the proposed action receives when evaluated by the criteria on BLM Form 8400-1. Photographs were taken at each KOP. The scenic quality of landforms, water, vegetation, and structure at each location was then assessed in terms of texture, color, form, and line. Each location was then ranked using seven factors, including landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modification (Appendix A*, BLM 8400-1 and BLM 8400-5 Forms*).

The BLM VRM process offers guidance regarding the fact that landscapes with low scenic quality need not be scrutinized as extensively as those that exhibit high scenic variety. The proposed action property is currently classified as a Class III, which represents a moderate value, and the objective of Class III is to partially retain the existing character of the landscape.

Scenic Quality Rating Units

The Scenic Quality Rating Units (SQRU) are defined in the BLM Scenic Quality Field Inventory, Form 8400-1 (Appendix A, *BLM 8400-1 and BLM 8400-5 Forms*) and BLM Scenic Quality Rating Summary, Form 8400-5 analysis (Appendix A and Table 4.2.2-1, *Scenic Quality Rating*), which were prepared to classify the scenic quality of each KOP prior to proposed action implementation. The scenic quality of an area is a measure of the visual appeal of a tract of land. In the BLM VRI process, public lands are given an A, B, or C rating based on the apparent scenic quality,[13] with A being of highest scenic value, as determined by an evaluation of the seven key factors: landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications. The KOPs used on each BLM form are representative of the proposed action area as a whole due to the homogeneity of the landscape of the area in which the proposed action is located. Therefore, the SQRUs given to each KOP are the ratings given to the proposed action area prior to implementation of the proposed action.

TABLE 4.2.2-1
SCENIC QUALITY RATING

Location	Landform	Vegetation	Water	Color	Adjacent Scenery	Scarcity	Cultural Modification	Total Score	Scenic Quality Rating
KOP 1	3	1	0	3	2	2	0	11	C
KOP 2	3	2	0	3	2	2	0	12	B
KOP 3	3	1	0	2	1	2	0	9	C
KOP 4	3	1	0	2	2	2	0	10	C

KEY: KOP = key observation point
NOTE: The rating system of each of the seven categories (landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications) is given on a scale of 0 to 5, where a 0 rating is the lowest (or least impact) and a 5 rating is the highest. The scenic quality ratings are scored as A, B, and C, with A being the highest scenic value.

4.2.3 Sensitivity

Under BLM methodology, sensitivity is determined by the score and or ratings the proposed action receives when evaluated by the criteria on BLM Form 8400-6. Photographs were taken at each KOP. Sensitivity was evaluated on several levels (Appendix C, *BLM 8400-6 Forms*). Sensitivity levels range from medium/low to high/medium.

For the purposes of VRI, the higher overall rating of sensitivity level is used to calculate the appropriate classification. BLM Form 8400-6 (Appendix C, *BLM 8400-6 Forms*) was used to determine sensitivity levels for the proposed action area. The KOPs used on the BLM form are representative of the proposed action area as a whole due to the homogeneity of the landscape in the proposed action area. Therefore, the Sensitivity Level Rating Units (SLRUs) given to each KOP

[13] Bureau of Land Management. n.d. *Visual Resources Inventory*. Manual H-8410-1. Washington, DC: U.S. Department of the Interior. Available at: http://www.blm.gov/nstc/VRM/8410.html

are the ratings given to the proposed action area (Table 4.2.3-1, *Sensitivity Level Rating*), displays the sensitivity levels near the proposed action, as determined by this analysis.

TABLE 4.2.3-1
SENSITIVITY LEVEL RATING

Location	Type of Users	Amount of Use	Public Interest	Adjacent Land Uses	Special Area Sensitivity	Other Factors	Overall Rating
KOP 1	L	M	L	M	NP	NP	L
KOP 2	L	M	L	M	NP	NP	L
KOP 3	L	M	L	M	NP	NP	L

KEY: KOP = key observation point; NP = Not Present; L = Low; M = Medium

4.2.4 Distance Zones

Distance zones are typically delineated based on visibility, not a uniformly applied buffer. However, due to the homogeneity of the proposed project / proposed action area's landscape and the homogeneity of the surrounding landscape overall, the distance zones were delineated in 1-mile increments. Additionally, the KOPs used for the proposed project / proposed action are representative of the proposed project / proposed action area because of the similar landscape. Therefore, the distance zones assigned to each KOP are the distance zones assigned to the proposed project / proposed action area.

4.2.5 Visual Contrast

Under BLM methodology (for unclassified BLM-administered lands), visual contrast is determined by the score and or ratings the proposed action receives when evaluated by the criteria on BLM Form 8400-4. Photographs were taken at each KOP. Visual contrast ratings were defined based on the four categories described in Section 3.0, *Method* (see Table 3.2.5-1, *BLM Degree of Contrast Criteria*).

Visual contrast rating forms were used to evaluate several factors (Appendix B, *BLM 8400-4 Forms*). The visual contrast rating forms describe the existing landscape character and visual sensitivity at each KOP; document the proposed project / proposed action and alternative facilities and actions that would be viewed at each KOP; and estimate the degree of change in line, form, color, and texture of the proposed project / proposed action.

Various BLM protocol forms and worksheets were completed for the proposed action to determine the level of contrast the proposed action would have on the existing visual resources (Appendix B). The visual contrast of landforms/water, vegetation, and structures at each location were then assessed in terms of texture, color, form, and line. Each KOP location was then evaluated examining the change from existing conditions anticipated from the proposed activity, as displayed in the visual simulation (Table 4.2.5-1, *Visual Contrast Rating Worksheet*).

TABLE 4.2.5-1
VISUAL CONTRAST RATING WORKSHEET

	Land/Water Body				Vegetation				Structures			
	Strong	**Moderate**	**Weak**	**None**	**Strong**	**Moderate**	**Weak**	**None**	**Strong**	**Moderate**	**Weak**	**None**
KOP 1												
Form			X				X				X	
Line			X				X				X	
Color			X				X				X	
Texture		X				X				X		
KOP 2												
Form			X				X				X	
Line			X				X				X	
Color			X				X				X	
Texture		X				X				X		
KOP 3												
Form			X				X				X	
Line			X				X				X	
Color			X				X				X	
Texture			X				X			X		
KOP 4												
Form			X				X				X	
Line			X				X				X	
Color			X				X				X	
Texture			X				X				X	

KEY: KOP = key observation point

4.3 VISUAL RESOURCE INVENTORY SUMMARY

The VRI is determined in a spatial context by combining overlays for scenic quality, sensitivity levels, distance zones, and visual contrast ratings, or by using a tabular matrix. Visual simulations were conducted so that a visual comparison could be made to existing conditions. The results of the VRI are presented in Table 4.3-1, *Visual Resource Inventory Summary*.

TABLE 4.3-1
VISUAL RESOURCE INVENTORY SUMMARY

Key Observation Point (KOP) Number and Description	Scenic Quality Rating	Visual Sensitivity	Distance Zones
KOP 1: A point KOP from the community of Keeler; representing a public gathering place	C	Low, considering minor local land use, existing native vegetation, no special area sensitivity, and no other factors	Foreground. Barely visible and intermixed with existing vegetation.
KOP 2: A linear KOP along SR 136; representing a public road	B	Low, considering minor local land use, existing native vegetation, no special area sensitivity, and no other factors	Foreground. Barely visible and intermixed with existing vegetation.
KOP 3: A point KOP from the County of Los Angeles Department of Water and Power scenic overlook; representing viewers on County of Los Angeles Department of Water and Power point of interest overlooks.	C	Low, considering minor local land use, existing native vegetation, no special area sensitivity, and no other factors	Foreground. Barely visible and intermixed with existing vegetation.
KOP 4: A linear KOP along SR 136; representing a public road; where the proposed project / proposed action would occupy the foreground	C	Low, considering minor local land use, existing native vegetation, no special area sensitivity, and no other factors	Foreground. Barely visible and intermixed with existing vegetation.

Bureau of Land Management. n.d. *Visual Resource Contrast Rating*. Manual 8431. Washington, DC: U.S. Department of the Interior. Available at: http://www.blm.gov/nstc/VRM/8431.html

Bureau of Land Management. n.d. *Visual Resources Inventory*. Manual H-8410-1. Washington, DC: U.S. Department of the Interior. Available at: http://www.blm.gov/nstc/VRM/8410.html

Bureau of Land Management. n.d. *Visual Resources Management*. Manual 8400. Washington, DC: U.S. Department of the Interior. Available at: http://www.blm.gov/nstc/VRM/8400.html

Bureau of Land Management. n.d. *VRM System*. Washington, DC: U.S. Department of the Interior. Available at: http://www.blm.gov/nstc/VRM/vrmsys.html

Primosch, Lawrence R., Bureau of Land Management, Bishop Field Office, Bishop, CA. 11 April 2012. Conference Call with Laura Kaufman, Donna Grotzinger, and Leanna Guillermo, Sapphos Environmental, Inc., Pasadena, CA.

Primosch, Lawrence R., Bureau of Land Management, Bishop Field Office, Bishop, CA. 24 April 2012. Proposed Project Site Visit with Grace Holders, Great Basin Unified Air Pollution District, Bishop, CA, and David Lee and Leanna Guillermo, Sapphos Environmental, Inc., Pasadena, CA.

Sapphos Environmental, Inc. 12 July 2011. Memorandum for the Record No. 1. Subject: Summary of the June 29, 2011, Project Kickoff Meeting for the Keeler Dunes Environmental Impact Report / Environmental Impact Statement. Pasadena, CA.

U.S. Census Bureau. 2010 Census. Washington, DC.

U.S. Geological Survey. 1987. *7.5-Minute Series, Dolomite, California, Topographic Quadrangle*. Reston, VA.

U.S. Geological Survey. 1987. *7.5-Minute Series, Owens Lake, California, Topographic Quadrangle*. Reston, VA.

APPENDIX A
BLM 8400-1 AND BLM 8400-5 FORMS

Form 8400-1
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SCENIC QUALITY FIELD INVENTORY

Date	05/18/12
District	
Resource Area	
Scenic quality rating unit	KOP 1

1. Evaluators *(names)*

Leanna Guillermo

2. LANDSCAPE CHARACTER *(Feature)*

	a. LANDFORM/WATER	b. VEGETATION	c. STRUCTURE *(General)*
FORM	Large, low, flat valley bottom; rolling mountain tops	Low, simple, native vegetation	Undeveloped with gravel road
LINE	Horizontal floor; slightly sloping ridgeline	Weak; follows landform	Undeveloped with straight gravel road
COLOR	Shades of gray; white; dark brown	Green and tan vegetation	Undeveloped with dark-gray gravel road
..URE	Smooth bases; subtle texture	Stippled; random	Smooth, uniform

3. Narrative

A low, flat valley bottom. Colors vary from brown to shades of gray to white. Little to no development is present.

4. SCORE *(Circle Appropriate Level)**

	HIGH	MEDIUM	LOW	EXPLANATION OR RATIONALE
a. Landform	5	3	1	Low but interesting with mountains
b. Vegetation	5	3	1	Minimal diversity
c. Water	5	3	0	Not noticeable
d. Color	5	3	1	Some interesting variety and intensity
e. Adjacent Scenery	5	3 2	0	Minimal influence
f. Scarcity	5+	3 2	1	Commonly seen in area
g. Cultural Modification	2	0	-4	Undeveloped
TOTALS	+	+		= 11

SCENIC QUALITY CLASSIFICATION

- [ ] A 19 or more
- [ ] B – 12–18
- [X] C – 11 or less

(Instructions on reverse)

INSTRUCTIONS

Following are the instructions for completing the form. The numbers correspond with the item numbers on the form.

1. **Evaluators.** List the names of the persons involved in the rating.
2. **Landscape Character.** Briefly describe the major features and elements in the landscape. Refer to illustrations 4, 5, 6, and 7 of the BLM Handbook 1-8431-1 for guidelines on the terminology to be used to describe the elements.
3. **Narrative.** Briefly describe the general character of the landscape as it relates to the immediate surroundings and to similar landscape features within the physiographic province.
4. **Scores.** Rate the scenic quality using the criteria and guidelines in the BLM Handbook 1-8410-1 Section II. Record the scores by circling the appropriate numbers. If the rating more appropriately falls between the listed numbers, write in the desired number and circle it. For example, if the desired number for "color" falls between 3 and 5, write in the number 4 and circle it. Explain any unusual factors affecting a rating under the "explanation and rationale" column. If more space is needed, continue the explanation on this page. After the ratings are completed total the scores and check the appropriate classification block.

U.S. Government Printing Office: 1988-573-017/81455 R8

Form 8400–1
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SCENIC QUALITY FIELD INVENTORY

Date 05/18/12

District

Resource Area

Scenic quality rating unit
KOP 2

1. Evaluators *(names)*

Leanna Guillermo

2. LANDSCAPE CHARACTER *(Feature)*

	a. LANDFORM/WATER	b. VEGETATION	c. STRUCTURE *(General)*
FORM	Large, low, flat valley bottom; rolling mountain tops	Low, simple, native vegetation	Paved road
LINE	Horizontal floor; slightly sloping ridgeline	Weak; follows landform	Straight, paved road
COLOR	Gray; off-white; dark brown	Green and tan vegetation	Black paved road
TEXTURE	Smooth bases; subtle texture	Stippled; coarse; random	Smooth, uniform

3. Narrative

A low, flat valley bottom. Colors vary from brown to off-white. Little to no development is present.

4. SCORE *(Circle Appropriate Level)**

	HIGH	MEDIUM	LOW	EXPLANATION OR RATIONALE
a. Landform	5	3	1	Low but interesting with mountains
b. Vegetation	5	3 2	1	Minimal diversity
c. Water	5	3	0	Not noticeable
d. Color	5	3	1	Some interesting variety with intensity
e. Adjacent Scenery	5	3 2	0	Minimal influence
f. Scarcity	5+	3 2	1	Commonly seen in area
g. Cultural Modification	2	0	-4	Little development
TOTALS	+	+	= 12	

SCENIC QUALITY CLASSIFICATION

☐ A 19 or more

☒ B – 12–18

☐ C – 11 or less

(Instructions on reverse)

INSTRUCTIONS

Following are the instructions for completing the form. The numbers correspond with the item numbers on the form.

1. **Evaluators.** List the names of the persons involved in the rating.
2. **Landscape Character.** Briefly describe the major features and elements in the landscape. Refer to illustrations 4, 5, 6, and 7 of the BLM Handbook 1-8431-1 for guidelines on the terminology to be used to describe the elements.
3. **Narrative.** Briefly describe the general character of the landscape as it relates to the immediate surroundings and to similar landscape features within the physiographic province.
4. **Scores.** Rate the scenic quality using the criteria and guidelines in the BLM Handbook 1-8410-1 Section II. Record the scores by circling the appropriate numbers. If the rating more appropriately falls between the listed numbers, write in the desired number and circle it. For example, if the desired number for "color" falls between 3 and 5, write in the number 4 and circle it. Explain any unusual factors affecting a rating under the "explanation and rationale" column. If more space is needed, continue the explanation on this page. After the ratings are completed total the scores and check the appropriate classification block.

U.S. Government Printing Office: 1988-573-017/81455 R8

Form 8400-1
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SCENIC QUALITY FIELD INVENTORY

Date 05/18/12

District

Resource Area

Scenic quality rating unit
KOP 3

1. Evaluators *(names)*

Leanna Guillermo

2. LANDSCAPE CHARACTER *(Feature)*

	a. LANDFORM/WATER	b. VEGETATION	c. STRUCTURE *(General)*
FORM	Large, low, flat valley bottom; rolling mountain tops	Low, simple, native vegetation	Undeveloped
LINE	Horizontal floor; slightly sloping ridgeline	Weak; follows landform	Undeveloped
COLOR	Shades of gray; white; dark brown	Green and tan vegetation	Undeveloped
TEXTURE	Smooth bases; subtle texture	Stippled; random	Undeveloped

3. Narrative

A low, flat valley bottom. Colors vary from brown to white. No development is present.

4. SCORE *(Circle Appropriate Level)**

	HIGH	MEDIUM	LOW	EXPLANATION OR RATIONALE
a. Landform	5	3	1	Low but interesting with mountains
b. Vegetation	5	3	1	Minimal diversity
c. Water	5	3	0	Not noticeable
d. Color	5	3 2	1	Some variety
e. Adjacent Scenery	5	3	0 1	Minimal influence
f. Scarcity	5+	3 2	1	Commonly seen in area
g. Cultural Modification	2	0	-4	Undeveloped
TOTALS	+	+		= 9

SCENIC QUALITY CLASSIFICATION

☐ A 19 or more

☒ B – 12–18

☐ C – 11 or less

(Instructions on reverse)

INSTRUCTIONS

Following are the instructions for completing the form. The numbers correspond with the item numbers on the form.

1. **Evaluators.** List the names of the persons involved in the rating.
2. **Landscape Character.** Briefly describe the major features and elements in the landscape. Refer to illustrations 4, 5, 6, and 7 of the BLM Handbook 1-8431-1 for guidelines on the terminology to be used to describe the elements.
3. **Narrative.** Briefly describe the general character of the landscape as it relates to the immediate surroundings and to similar landscape features within the physiographic province.
4. **Scores.** Rate the scenic quality using the criteria and guidelines in the BLM Handbook 1-8410-1 Section II. Record the scores by circling the appropriate numbers. If the rating more appropriately falls between the listed numbers, write in the desired number and circle it. For example, if the desired number for "color" falls between 3 and 5, write in the number 4 and circle it. Explain any unusual factors affecting a rating under the "explanation and rationale" column. If more space is needed, continue the explanation on this page. After the ratings are completed total the scores and check the appropriate classification block.

U.S. Government Printing Office: 1988-573-017/81455 R8

Form 8400–1
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SCENIC QUALITY FIELD INVENTORY

Date 05/18/12

District

Resource Area

Scenic quality rating unit
KOP 4

1. Evaluators *(names)*

Leanna Guillermo

2. LANDSCAPE CHARACTER *(Feature)*

	a. LANDFORM/WATER	b. VEGETATION	c. STRUCTURE *(General)*
FORM	Large, low valley bottom; sloping mountain tops	Low, simple, native vegetation	Vertical power poles
LINE	Horizontal floor; sloping hilltops	Weak; follows landform	Vertical, straight power poles
COLOR	Gray, off-white, brown	Green and tan vegetation	Brown power poles
TEXTURE	Subtle texture	Stippled, coarse, random	Smooth, uniform

3. Narrative

A low valley bottom; Colors vary from brown to off-white. Little to no development is present.

4. SCORE *(Circle Appropriate Level)**

	HIGH	MEDIUM	LOW	EXPLANATION OR RATIONALE
a. Landform	5	3	1	Low but interesting with mountains
b. Vegetation	5	3	1	Minimal diversity
c. Water	5	3	0	Not noticeable
d. Color	5	3 2	1	Some variety
e. Adjacent Scenery	5	3 2	0	Minimal influence
f. Scarcity	5+	3 2	1	Commonly seen in area
g. Cultural Modification	2	0	-4	Little development
TOTALS	+	+	= 10	

SCENIC QUALITY CLASSIFICATION

☐ A 19 or more

☐ B – 12–18

☒ C – 11 or less

(Instructions on reverse)

INSTRUCTIONS

Following are the instructions for completing the form. The numbers correspond with the item numbers on the form.

1. **Evaluators.** List the names of the persons involved in the rating.
2. **Landscape Character.** Briefly describe the major features and elements in the landscape. Refer to illustrations 4, 5, 6, and 7 of the BLM Handbook 1-8431-1 for guidelines on the terminology to be used to describe the elements.
3. **Narrative.** Briefly describe the general character of the landscape as it relates to the immediate surroundings and to similar landscape features within the physiographic province.
4. **Scores.** Rate the scenic quality using the criteria and guidelines in the BLM Handbook 1-8410-1 Section II. Record the scores by circling the appropriate numbers. If the rating more appropriately falls between the listed numbers, write in the desired number and circle it. For example, if the desired number for "color" falls between 3 and 5, write in the number 4 and circle it. Explain any unusual factors affecting a rating under the "explanation and rationale" column. If more space is needed, continue the explanation on this page. After the ratings are completed total the scores and check the appropriate classification block.

U.S. Government Printing Office: 1988-573-017/81455 R8

Form 8400-5
(May 1984)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SCENIC QUALITY RATING SUMMARY

Date 05/18/12

District

Resource Area

1. Evaluators (*names*)

Leanna Guillermo

SCENIC QUALITY RATING UNITS (1)	Landform (2)	Vegetation (3)	Water (4)	Color (5)	Adjacent Scenery (6)	Scarcity (7)	Cultural Modification (8)	Total Score (9)	Scenic Quality Rating (10	EXPLANATION (11)
KOP 1	3	1	0	3	2	2	0	11	C	A low valley bottom with little to no development.
KOP 2	3	2	0	3	2	2	0	12	B	A low valley bottom with little development and some interesting variety/intensity of color.
KOP 3	3	1	0	2	1	2	0	9	C	A low valley bottom with no development.
KOP 4	3	1	0	2	2	2	0	10	C	A low valley bottom with little development.

INSTRUCTIONS

Form is used in conjunction with the Scenic Quality Inventory and Evaluation Chart.

APPENDIX B
BLM 8400-4 FORMS

Form 8400-4
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 5/18/12

District

Resource Area

Activity (program)

SECTION A. PROJECT INFORMATION

1. Project Name Keeler Dunes Dust Control Project	4. Location Township ______ Range ______ Section ______	5. Location Sketch
2. Key Observation Point KOP #1		
3. VRM Class		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Large, low, flat valley bottom; rolling mountain tops	Low, sparse, simple native vegetation	Undeveloped with gravel road
LINE	Horizontal floor, slightly sloping ridgeline	Weak; follows landform	Undeveloped, straight gravel road
COLOR	Shades of gray; white; dark brown	Green and tan vegetation	Undeveloped with dark gray gravel road
TEXTURE	Smooth bases; subtle texture	Stippled; random	Smooth, uniform

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Large, low flat valley bottom; rolling mountain tops	Low, sparse, simple native vegetation	Undeveloped with gravel road and low straw bales
LINE	Horizontal floor, slightly sloping ridgeline	Weak; follows landform	Undeveloped, straight gravel road; and weak landform following straw bales
COLOR	Shades of gray; white; dark brown	Green and tan vegetation	Undeveloped with dark gray gravel road; tan straw bales
TEXTURE	Smooth bases; subtle texture	Stippled; random	Coarse; uniform

SECTION D. CONTRAST RATING ■ SHORT TERM ☐ LONG TERM

1.

DEGREE OF CONSTRAST	LAND/WATER BODY (1) Strong	LAND/WATER BODY (1) Moderate	LAND/WATER BODY (1) Weak	LAND/WATER BODY (1) None	VEGETATION (2) Strong	VEGETATION (2) Moderate	VEGETATION (2) Weak	VEGETATION (2) None	STRUCTURES (3) Strong	STRUCTURES (3) Moderate	STRUCTURES (3) Weak	STRUCTURES (3) None
ELEMENTS: Form			X				X				X	
ELEMENTS: Line			X				X				X	
ELEMENTS: Color			X				X				X	
ELEMENTS: Texture		X				X				X		

2. **Does project design meet visual resource management objectives?** ■ **Yes** ☐ **No**
(Explain on reverse side)

3. **Additional mitigating measures recommended?**
☐ **Yes** ■ **No** **(Explain on reverse side)**

Evaluator's Names **Date**

Leanna Guillermo
David Lee

Form 8400-4
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 5/18/12

District

Resource Area

Activity (program)

SECTION A. PROJECT INFORMATION

1. Project Name
Keeler Dunes Dust Control Project

2. Key Observation Point
KOP #2

3. VRM Class

4. Location

Township ____________

Range ____________

Section ____________

5. Location Sketch

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Large, low, flat valley bottom; rolling mountain tops	Low, simple native vegetation	Undeveloped with paved road
LINE	Horizontal floor, slightly sloping ridgeline	Weak; follows landform	Undeveloped, straight paved road
COLOR	Shades of gray; white; dark brown	Green and tan vegetation	Undeveloped with dark gray paved road
TEXTURE	Smooth bases; subtle texture	Stippled; random	Smooth, uniform

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Large, low flat valley bottom; rolling mountain tops	Low, simple native vegetation	Undeveloped with paved road and low straw bales
LINE	Horizontal floor, slightly sloping ridgeline	Weak; follows landform	Undeveloped, straight paved road; and weak landform following straw bales
COLOR	Shades of gray; white; dark brown	Green and tan vegetation	Undeveloped with dark gray paved road; tan straw bales
TEXTURE	Smooth bases; subtle texture	Stippled; random	Coarse; uniform

SECTION D. CONTRAST RATING ■ SHORT TERM ☐ LONG TERM

1. DEGREE OF CONSTRAST

ELEMENTS	LAND/WATER BODY (1) Strong	Moderate	Weak	None	VEGETATION (2) Strong	Moderate	Weak	None	STRUCTURES (3) Strong	Moderate	Weak	None
Form			X				X				X	
Line			X				X				X	
Color			X				X				X	
Texture		X				X				X		

2. Does project design meet visual resource management objectives? ■ Yes ☐ No
(Explain on reverse side)

3. Additional mitigating measures recommended?
☐ Yes ■ No (Explain on reverse side)

Evaluator's Names | Date

Leanna Guillermo
David Lee

Form 8400-4
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 5/18/12

District

Resource Area

Activity (program)

SECTION A. PROJECT INFORMATION

1. Project Name	4. Location	5. Location Sketch
Keeler Dunes Dust Control Project	Township ____________	
2. Key Observation Point KOP #3	Range ____________	
3. VRM Class	Section ____________	

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Large, low, flat valley bottom; rolling mountain tops	Low, simple native vegetation	Undeveloped
LINE	Horizontal floor, slightly sloping ridgeline	Weak; follows landform	Undeveloped
COLOR	Shades of gray; white; dark brown	Green and tan vegetation	Undeveloped
TEXTURE	Smooth bases; subtle texture	Stippled; random	Undeveloped

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Large, low flat valley bottom; rolling mountain tops	Low, simple native vegetation	Low straw bales
LINE	Horizontal floor, slightly sloping ridgeline	Weak; follows landform	Weak landform following straw bales
COLOR	Shades of gray; white; dark brown	Green and tan vegetation	Tan straw bales
TEXTURE	Smooth bases; subtle texture	Stippled; random	Coarse; uniform

SECTION D. CONTRAST RATING ■ SHORT TERM ☐ LONG TERM

1. DEGREE OF CONTRAST

		FEATURES											
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS	Form			X				X				X	
	Line			X				X				X	
	Color			X				X				X	
	Texture			X				X			X		

2. Does project design meet visual resource management objectives? ■ Yes ☐ No (Explain on reverse side)

3. Additional mitigating measures recommended? ☐ Yes ■ No (Explain on reverse side)

Evaluator's Names — Date

Leanna Guillermo
David Lee

Form 8400-4
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date 5/18/12

District

Resource Area

Activity (program)

SECTION A. PROJECT INFORMATION

1. Project Name
Keeler Dunes Dust Control Project

2. Key Observation Point
KOP #4

3. VRM Class

4. Location

Township ____________

Range ____________

Section ____________

5. Location Sketch

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Large, low, flat valley bottom; rolling mountain tops	Low, simple native vegetation	Vertical power poles
LINE	Horizontal floor, sloping hilltops	Weak; follows landform	Vertical, straight power poles
COLOR	Gray; off-white; brown	Green and tan vegetation	Brown power poles
TEXTURE	Subtle texture	Stippled; coarse; random	Smooth; uniform

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Large, low flat valley bottom; rolling mountain tops	Low, simple native vegetation	Vertical power poles; low straw bales
LINE	Horizontal floor, sloping hilltops	Weak; follows landform	Vertical, straight power poles; weak landform following straw bales
COLOR	Gray; off-white; brown	Green and tan vegetation	Brown power poles and tan straw bales
TEXTURE	Subtle texture	Stippled; coarse; random	Coarse; uniform

SECTION D. CONTRAST RATING ■ SHORT TERM ☐ LONG TERM

1. DEGREE OF CONSTRAST — FEATURES

ELEMENTS	LAND/WATER BODY (1) Strong	Moderate	Weak	None	VEGETATION (2) Strong	Moderate	Weak	None	STRUCTURES (3) Strong	Moderate	Weak	None
Form			X				X				X	
Line			X				X				X	
Color			X				X				X	
Texture			X				X				X	

2. Does project design meet visual resource management objectives? ■ Yes ☐ No (Explain on reverse side)

3. Additional mitigating measures recommended? ☐ Yes ■ No (Explain on reverse side)

Evaluator's Names | Date

Leanna Guillermo
David Lee

APPENDIX C
BLM 8400-6 FORMS

Form 8400-6
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SENSITIVITY LEVEL RATING SHEET

Date
District
Resource Area

1. Evaluators *(names)*

SENSITIVITY LEVEL RATING UNIT (1)	Type of User (2)	Amount of Use (3)	Public Interest (4)	Adjacent Land Uses (5)	Special Areas (6)	Other Factors (7)	Overall Rating (8)	EXPLANATION (9)
KOP 1	L	M	L	M	NP	NP	L	Landscape features scattered, low, native vegetation. Adjacent to the community of Keeler and State Route (SR) 136.
KOP 2	L	M	L	M	NP	NP	L	Landscape features scattered, low, native vegetation and undisturbed. Adjacent to the community of Keeler and SR 136.
KOP 3	L	M	L	M	NP	NP	L	Landscape features scattered, low, native vegetation and undisturbed. Adjacent to the community of Keeler and SR 136.
KOP 4	L	M	L	M	NP	NP	L	Landscape features scattered, low, native vegetation and largely undisturbed. Adjacent to the community of Keeler and SR 136.

(Instructions on reverse)

APPENDIX C
AIR QUALITY AND GREENHOUSE GAS EMISSIONS TECHNICAL REPORT

KEELER DUNES DUST CONTROL PROJECT
AIR QUALITY AND GREENHOUSE GAS EMISSIONS
TECHNICAL REPORT

PREPARED FOR:

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT
157 SHORT STREET
BISHOP, CALIFORNIA 93514

PREPARED BY:

SAPPHOS ENVIRONMENTAL, INC.
430 NORTH HALSTEAD STREET
PASADENA, CALIFORNIA 91107

MARCH 21, 2014

TABLE OF CONTENTS

SECTIONS **PAGE**

TABLES **PAGE**

FIGURES ***FOLLOW PAGE***

APPENDICES

SECTION ES
EXECUTIVE SUMMARY

This Air Quality and Greenhouse Gas Emissions Technical Report was undertaken by Sapphos Environmental, Inc. for the Great Basin Unified Air Pollution Control District (District) and the U.S. Department of the Interior Bureau of Land Management (BLM) in support of the proposed Keeler Dunes Dust Control Project (proposed project / proposed action). The District anticipates that the proposed project / proposed action would need to be implemented partially on quasi-public lands owned by the LADWP and partially on lands administered by the BLM. Work on lands administered by the BLM would require issuance of a right-of-way permit by the BLM.

This report was prepared to address potential construction-related air quality and greenhouse gas (GHG) emissions issues identified as requiring further analysis to define significance levels of air quality and GHG emissions impacts pursuant to the California Environmental Quality Act (CEQA). Construction of the proposed project / proposed action would entail the planting and establishment of native vegetation and placement of straw bales as a temporary wind break.

The main conclusions of this report are as follows:

- Construction of the proposed project / proposed action would generate short-term emissions of criteria pollutants. Particulates would be generated from traversing the site to place the straw bales and planting. The annual emissions of particulate matter (PM_{10}) associated with the proposed project / proposed action's construction activities are anticipated to be below the thresholds of significance and, as such, would be expected to result in a less than significant impact to air quality.

- Operation of the proposed project / proposed action would not result in significant emissions of criteria pollutants. The proposed project / proposed action is a vegetation and dust management program. The vegetation effort would reduce dust emissions such that the Federal and State PM10 standards are met in Keeler; therefore, PM_{10} associated with the operational activities would be below the thresholds of significance and, as such, would be expected to result in a less than significant impact to air quality.

- The nearest sensitive receptors in the vicinity of the proposed project / proposed action site include the community of Swansea located adjacent and to the north and the community of Keeler to the southeast, one designated Native American reservation (Lone Pine Paiute-Shoshone Indian Reservation) approximately 10 miles to the northwest, and the town of Lone Pine approximately 10 miles to the northwest. Fugitive dust impacts to these sensitive receptors would be below the level of significance.

- Impacts to sensitive receptors in the vicinity of the proposed project / proposed action property related to toxic air contaminant emissions would be expected to be below the level of significance.

- Odor impacts associated with the proposed project / proposed action would be expected to be below the level of significance.

- The proposed project / proposed action would be consistent with the Owens Valley 2008 Air Quality Attainment Plan.

- The proposed project / proposed action's construction and operation phases would not be expected to result in substantial increases in GHG emissions, and the cumulative impact to global climate change would be expected to be below the level of significance. Operation of the proposed project / proposed action would sequester carbon emissions and, therefore, would be expected to reduce GHG emissions.

- In accordance with the 2008 State Implementation Plan (SIP), compliance with District Rules 400 and 401 is required to reduce fugitive dust emissions to the maximum extent feasible during construction.

- Air quality impacts related to PM_{10} emissions during construction would not result in a potentially significant cumulative impact when considering the proposed project / proposed action in conjunction with related past, present, or reasonably foreseeable probable future projects.

- Air quality impacts related to PM_{10} emissions during operation would result in a reduction in cumulative impact when considering the proposed project / proposed action in conjunction with related past, present, or reasonably foreseeable probable future projects.

Table ES-1, *Summary of Findings*, summarizes the main conclusions of this report on construction and operation impacts.

TABLE ES-1
SUMMARY OF FINDINGS

	Annual Impacts	Emissions					
		VOCs	NO_x	CO	SO_x	$PM_{2.5}$	PM_{10}
Unmitigated (Significant?)	Construction	N/A	N/A	N/A	N/A	N/A	No
	Operation	N/A	N/A	N/A	N/A	N/A	No
	Cumulative construction	N/A	N/A	N/A	N/A	N/A	No
	Cumulative operation	N/A	N/A	N/A	N/A	N/A	No
		Other Emission Impacts					
	Impacts to sensitive receptors	No					
	Toxic air contaminants (TACs)	No					
	Odor	No					
	Inconsistent with Inyo County 2008 Air Quality Attainment Plan	No					
	Greenhouse gas emissions	No					
After compliance with Rules 400, 401, and the 2008 SIP (Significant?)	Construction	N/A	N/A	N/A	N/A	N/A	No
	Operation	N/A	N/A	N/A	N/A	N/A	No
	Cumulative construction	N/A	N/A	N/A	N/A	N/A	No
	Cumulative operation	N/A	N/A	N/A	N/A	N/A	No
		Other Emission Impacts					
	Impacts to sensitive receptors	No					
	Toxic air contaminants (TACs)	No					
	Odor	No					
	Inconsistent with Inyo County 2008 Air Quality Attainment Plan	No					
	Greenhouse gas emissions	No					

KEY: N/A = not applicable

In conclusion, construction-related air quality impacts would be below the level of significance. Compliance with District Rules 400 and 401 and additional measures required in the 2008 SIP would further avoid and reduce construction-related emissions. Direct impacts from the operation of the proposed project / proposed action would be below the level of significance. Cumulative impacts related to PM_{10} emissions during construction would also be reduced to the maximum extent feasible by placing straw bales prior to planting. In addition, the proposed project / proposed action's planting of carbon-sequestering vegetation would create long-term benefits to air quality and GHG emissions. Overall, implementation of the proposed project / proposed action would produce long-term reductions of PM_{10} that may benefit nearby communities.

1.1 PURPOSE AND SCOPE

This Air Quality and Greenhouse Gas Emissions Technical Report was undertaken by Sapphos Environmental, Inc. for the Great Basin Unified Air Pollution Control District (District) and the U.S. Department of the Interior Bureau of Land Management (BLM), in support of the proposed Keeler Dunes Dust Control Project (proposed project / proposed action). This report identifies existing conditions in the study area as they relate to air quality and relevant regulatory framework. In addition, this report evaluates potential air quality impacts associated with the proposed project / proposed action; proposes measures to mitigate any potentially significant impacts to air quality caused by implementation of the proposed project / proposed action; and documents the findings of the levels of significance after mitigation, where recommended. This report evaluates all phases (that is, construction, operation, and maintenance phases) of the proposed project / proposed action, as well as the potential cumulative impacts and impacts related to greenhouse gas (GHG) emissions.

The purpose of the proposed project / proposed action, in combination with other ongoing dust control measures that have been and are being implemented on the lake bed, is to improve air quality through the reduction of particulate matter (PM_{10}) emissions throughout the Owens Valley Planning Area (OVPA), consistent with the 2008 State Implementation Plan Demonstration of Attainment Project (2008 SIP). In particular, the purpose of this proposed project / proposed action is to reduce the exposure of residents of the communities of Swansea and Keeler to unhealthy levels of PM_{10} emissions. Dust control measures (DCMs) are necessary at the Keeler Dunes to bring these areas into compliance with the National Ambient Air Quality Standards (NAAQS) and California State standards for PM_{10}.

1.2 LOCATION

The proposed project / proposed action is located immediately north-northwest of the community of Keeler, California, and east of the 110-square-mile (70,000-acre) Owens Lake bed within the Owens Valley, Inyo County, California (Figure 1.2-1, *Regional Vicinity Map*). The proposed project / proposed action is located approximately 10 miles southeast of the town of Lone Pine and approximately 65 miles south of the City of Bishop. The proposed project / proposed action is located approximately 10 miles to the west of Death Valley National Park, approximately 11 miles to the east of Sequoia National Park, and approximately 48 miles north of the City of Ridgecrest (Figure 1.2-1). The nearest sensitive receptors include the community of Keeler southeast of the proposed project / proposed action and Swansea to the north (Figure 1.2-2, *Study Area Location Map*). One designated Native American reservation, the Lone Pine Paiute-Shoshone Indian Reservation, is located approximately 10 miles to the northwest (Figure 1.2-1). The proposed project / proposed action is located within the Owens Valley Planning Area (OVPA) of the District (Figure 1.2-3, *Study Area Boundary in Relation to Owens Valley Planning Area*). The OVPA is situated in the southern end of the Owens Valley, and implementation of various DCMs on the Owens Lake Bed has been ongoing since the year 2001.

The location of the study area is depicted on the U.S. Geological Survey (USGS) 7.5-minute series, Owens Lake and Dolomite, topographic quadrangles[1,2] (Figure 1.2-4, *Topographic Map with USGS 7.5-Minute Quadrangle Index*). The topography of the study area consists of alluvial fan and former shorelines of Owens Lake covered by sand sheets and sand dunes. Elevation ranges from approximately 3,600 feet above mean sea level (MSL) to approximately 3,885 feet above MSL.

The proposed project / proposed action site is approximately 194 acres in size and is located within a 1.36-square-mile (870.6-acre) study area. The study area is bounded approximately by the Inyo Mountains on the east-northeast and the historic Owens Lake bed on the west-southwest and extends approximately 2.5 miles to the northwest from the community of Keeler. California State Route (SR) 136 bisects the 1.36-square-mile study area. The proposed project / proposed action is located on lands administered by the BLM Bishop Office and the City of Los Angeles Department of Water and Power (LADWP).

In addition to the BLM and LADWP, other stakeholders have an interest in the proposed project / proposed action: Inyo County, Lahontan Regional Water Quality Control Board, Lone Pine-Paiute Shoshone Tribe, Big Pine Band of Owens Valley, Bishop Paiute Tribe, Fort Independence Indian Community of Paiute Indians, Timbisha Shoshone Tribe, California State Lands Commission, Office of Historic Preservation, Native American Lands Commission, Caltrans District 9, Southern Pacific Railroad, Keeler Community Services District, and Keeler and Swansea residents.

1.3 DESCRIPTION OF THE PROPOSED PROJECT / PROPOSED ACTION

The proposed project / proposed action is a program to stabilize a portion of the emissive Keeler Dunes and associated sand deposits to reduce dust emissions that are causing and contributing to exceedances of the NAAQS and California State standards for PM_{10} in the OVPA. The basis of an effective dust control strategy must be to stabilize the Keeler Dunes such that high wind events will not result in fugitive dust emissions that exceed the federal and state standards in Keeler and Swansea. The District has determined, based in its expertise in dust control, that the preferred method to control fugitive dust emissions in the Keeler Dunes and to meet ambient air quality standards and be consistent with the BLM Resource Management Plan involves establishment of a native vegetation surface protection coupled with straw bales as a temporary wind barrier.

1.3.1 Elements of the Proposed Project / Proposed Action

The DCM involves the establishment of a mix of native vegetation within specified dust emitting areas of the Keeler Dunes. The goal would be to create a natural vegetated dune environment that mimics comparable natural environments such as the existing Swansea Dunes (located to the northeast) and other stable shoreline dunes in the region. The establishment of native vegetation would act to prevent high emissions of dust by breaking up the wind and lowering the wind speed at the ground surface.

The proposed project / proposed action would entail placement of straw bales and native plants in approximately 194 acres within the dunes to achieve 85 percent (17 acres) and 95 percent (177 acres) dust control efficiency. A random pattern would be used for straw bale placement to mimic natural vegetation patterns. *Atriplex polycarpa* and a mixture of other types of native vegetation will be planted. Initially, the dust control reduction will be achieved through the array of straw

[1] U.S. Geological Survey. 1987. *7.5-Minute Series, Owens Lake, California, Topographic Quadrangle*. Reston, VA.

[2] U.S. Geological Survey. 1987. *7.5-Minute Series, Dolomite, California, Topographic Quadrangle*. Reston, VA.

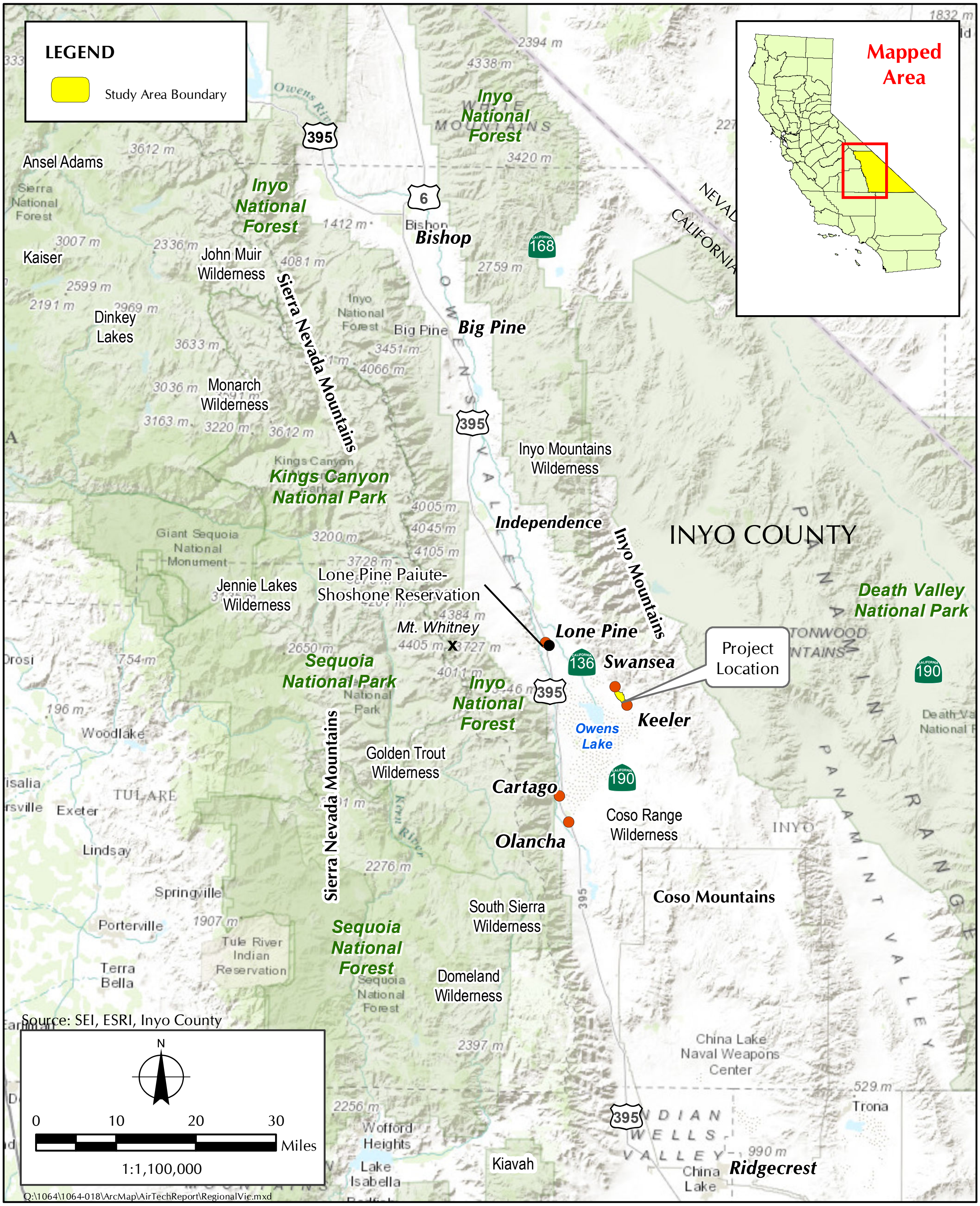

FIGURE 1.2-1
Regional Vicinity Map

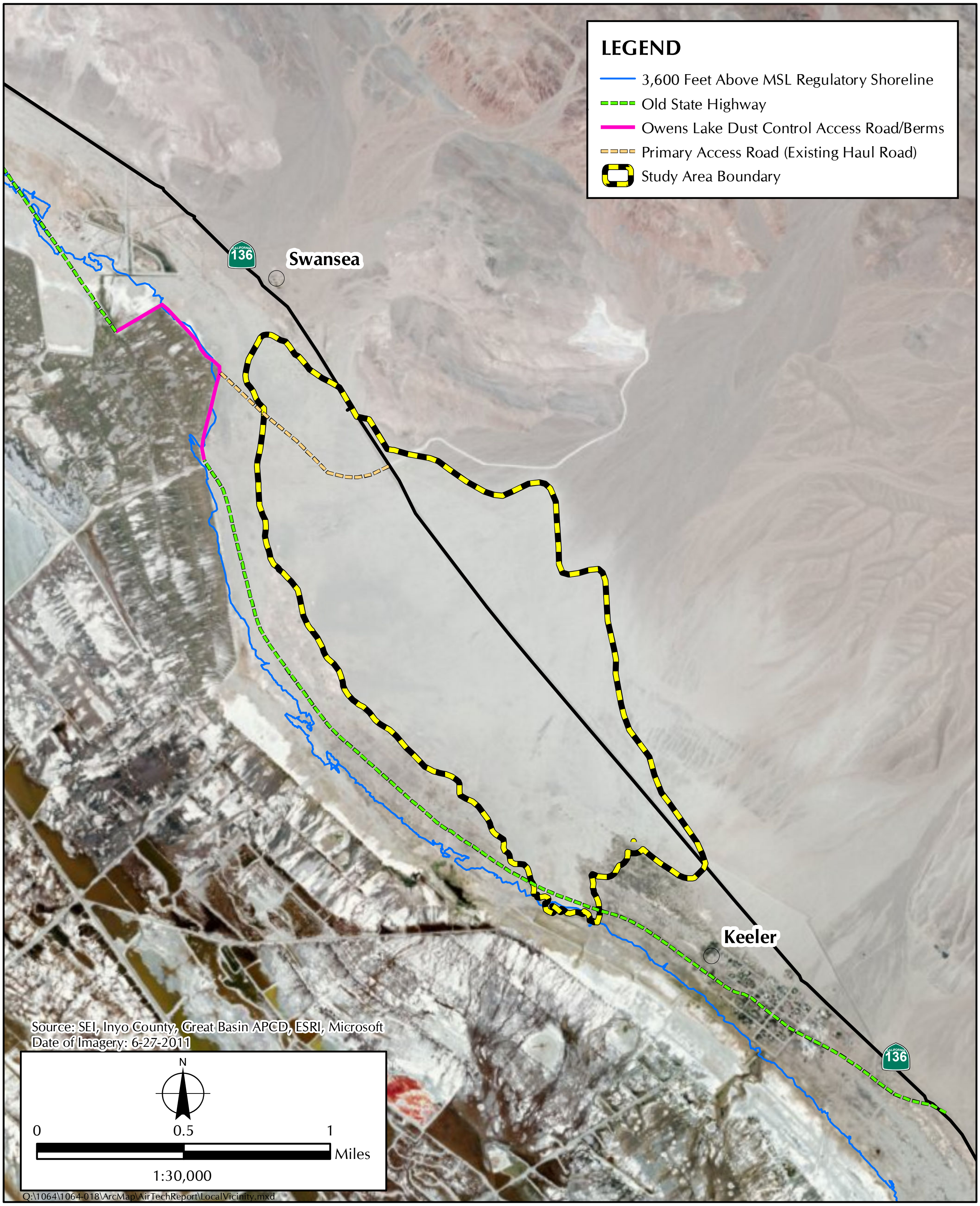

FIGURE 1.2-2

Study Area Location Map

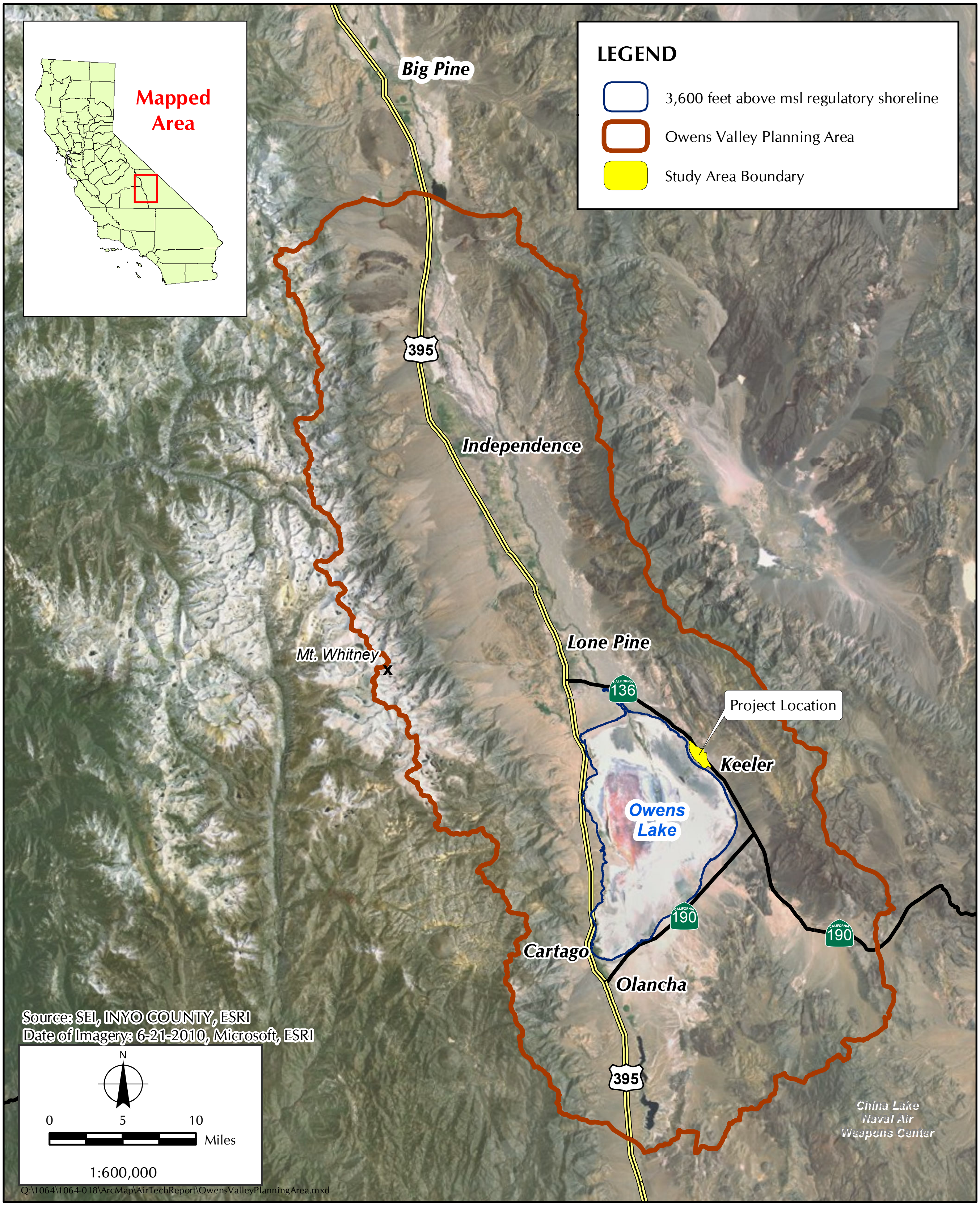

FIGURE 1.2-3
Study Area Boundary in Relation to Owens Valley Planning Area

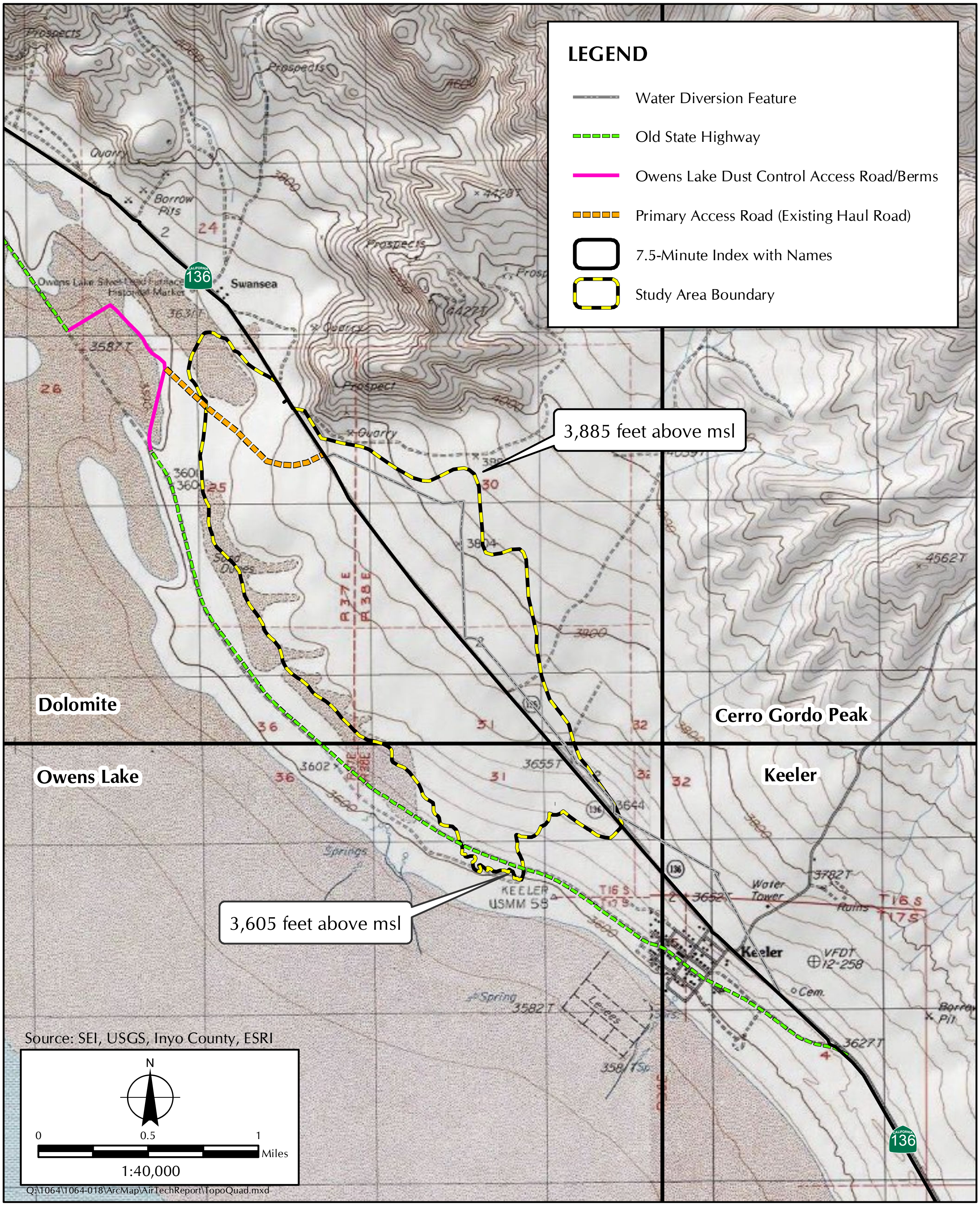

FIGURE 1.2-4

Topographic Map with USGS
7.5-Minute Quadrangle Index

bales. Over time, dust control will be taken over by the plants as they grow and mature. In addition, the straw bales provide a protected environment for the plants. Periodic watering of the plants in the spring (March/April) and fall (September/October)may be needed in low-rainfall years for up to 3 years until the vegetation is sufficiently established. The long-term goal of this DCM would be the establishment of a self-sustaining native vegetation cover to control dust with minimal long-term maintenance. Continued monitoring would be required and minimal long-term maintenance would be anticipated with this DCM.

Other elements include infrastructure elements such as temporary access routes, temporary staging area for equipment, straw bales and plants, a water storage tank, and an effectiveness monitoring program (existing air monitoring stations). The estimated time period for construction is approximately 11 months with planting occurring in October through January. Supplemental watering, if necessary, would be conducted in spring and fall and would require approximately 2–3 months to complete. More specific details of the proposed project / proposed action elements are detailed below.

Native Vegetation

This DCM involves the establishment of a mix of native vegetation within the dust emitting areas shown on Figure 1.3.1-1, *Location of Infrastructure Elements Common to All Action Alternatives*. The goal would be to create a natural vegetated dune environment that would act to prevent high emissions of dust by breaking up the wind and lowering the wind speed at the surface. The District designed the proposed project / proposed action to minimize environmental impacts by applying two different control levels at the site. The approximate number of plants and straw bales necessary to achieve anestimated 85- and 95-percent dust control efficiency is summarized in Table 1.3.1-1, *Dust Control Measure Elements*.

TABLE 1.3.1-1
DUST CONTROL MEASURE ELEMENTS

Element	Minimum Control Efficiency (%)	Number of Acres	No. Required per Acre	Total No. Required
Native vegetation	95	177	1,983	350,991
Native vegetation	85	17	1,092	18,564
Total	—	—	—	369,555
Straw bales*	95	177	661	116,997
Straw bales	85	17	364	6,188
Total bales	—	—	—	123,185

NOTE: * The dimensions of the straw bales are 0.6 x 0.4 x 1.17 meters.

Native vegetation to be planted within the dust control areas include *Atriplex polycarpa* (ATPO; 66 percent) and a mixture of other native plant species (33 percent). Planting will involve initial placement of a straw bale (see *Other Elements*, below), followed by installation of native plants along the base of the straw bale. In addition, seeds of native plants may be dispersed in open areas between the straw bales.

Straw Bales

This is a temporary element of the dust control measure that would be used to stabilize emissive dust areas and provide a sheltered environment for plants during establishment. The proposed project / proposed action will utilize straw bales (24 x 16 x 48 inches or similar size) installed in an irregular pattern across the emissive areas. Table 1.3.1-1 provides the number of straw bales necessary for 85 and 95 percent dust control. All straw bales used at the dunes would be certified weed free to minimize the threat from invasive weeds. Straw bales are anticipated to degrade over a period of several years and would provide organic material to the existing soil. Limited maintenance of straw bales (replacement of broken bales) is anticipated.

Other Elements

Other elements include infrastructure elements that may consist of access routes, staging areas, water supply, conveyance and water distribution facilities, and an effectiveness monitoring program.

Staging Areas

Four temporary staging areas will be established to provide contractor(s) with storage and placement of equipment, straw bales, native plants, supplies, and in Alternative 3 only, temporary water storage tanks. The staging area(s) will be located on land near the proposed project / proposed action area (Figure 1.3.1-1). The total area of the proposed staging areas is approximately 3.2 acres, all of which are considered temporary impacts.

One main staging area (Staging Area 1) will be established within the northwestern edge of the proposed project / proposed action area on land administered by the BLM (Figure 1.3.1-1). Located immediately east of Old State Highway, the staging facility will measure 50 feet by 300 feet in area and will be used by the contractor(s) for the storage of equipment, fuel, all-terrain vehicles (ATVs), native plants, and other supplies.

Staging Area 2 will also be constructed for the proposed project / proposed action along the Old State Highway, on land managed by the LADWP (Figure 1.3.1-1). Staging area 2 will measure 200 feet by 400 feet and construction crew may park at this location.

Staging Area 3 is located on land managed by the BLM and will measure 150 feet by 300 feet, and has been designed to accommodate the ability for trucks to turn around. Both Staging Area 2 and 3 will be used for the temporary storage of equipment and materials needed for DCMs in the central and southern portions of the proposed project / proposed action area.

Staging Area 4 will be established adjacent to the gravel haul road constructed by the LADWP for dust mitigation on the Owens Lake, adjacent to the turn-off onto SR 136 (Figure 1.3.1-1). This staging area will be placed on previously disturbed land within the graveled limits of the existing road; thus, no vegetative removal is necessary. The area will measure approximately 10 feet by 200 feet and will be used primarily for temporary straw bale storage.

Staging Areas 1, 2, and 3 will require the brushing of vegetation in order for them to function. These staging areas will be restored and revegetated after the proposed project / proposed action has been completed.

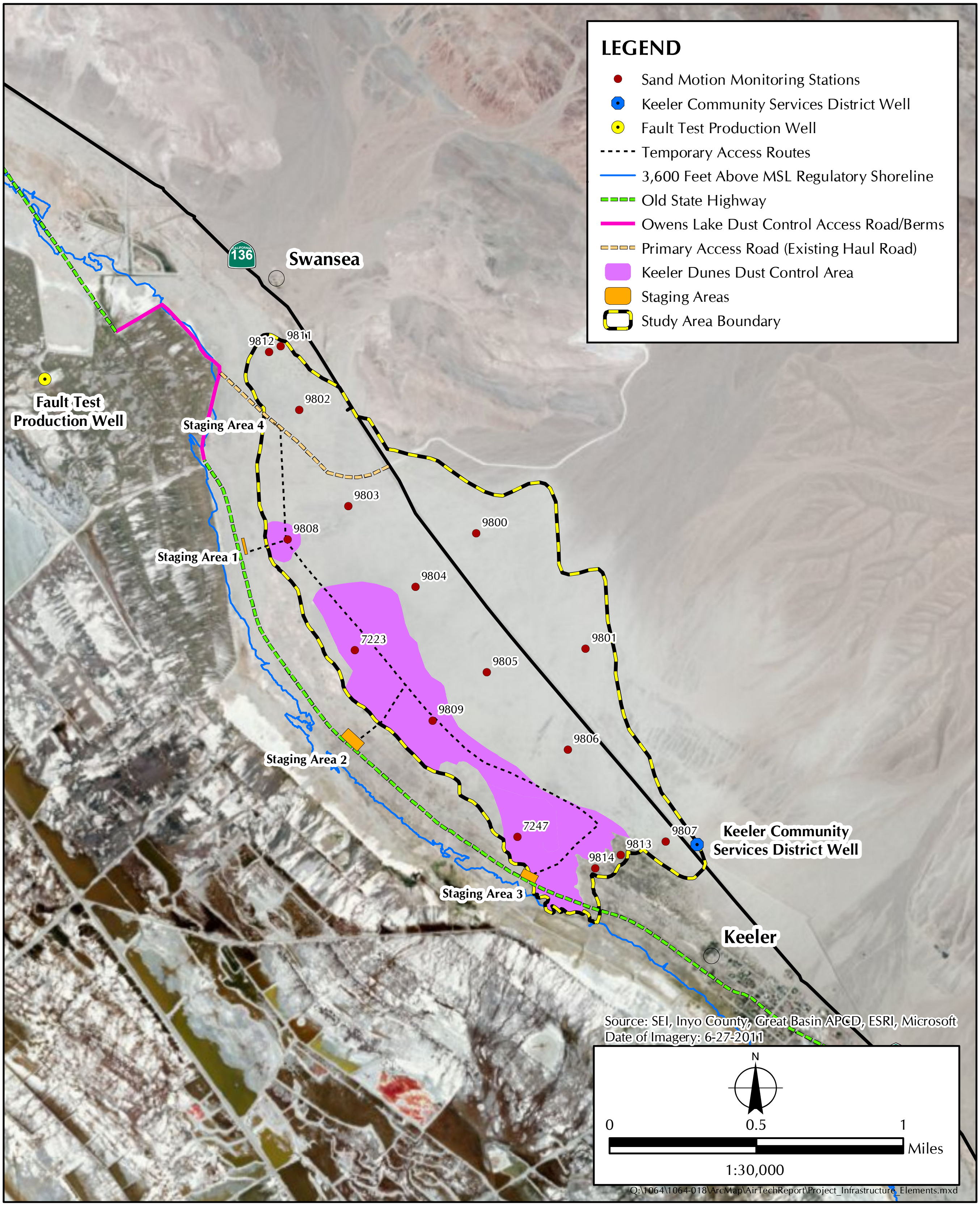

FIGURE 1.3.1-1
Location of Infrastructure Elements
Common to All Action Alternatives

Access Routes

A temporary access route for ATV travel will be established for use during placement of straw bales and planting and watering activities. ATVs will be used to haul straw bales, plants, and water to the dust control areas. The temporary access route will be sited to minimize impacts to existing vegetation and cultural resources. The temporary access route will be prepared by brushing and grubbing (leaving the roots in place). No supplemental materials such as asphalt or gravel will be used. Following completion of planting and watering activities, the temporary access route will be restored utilizing straw bales and native plants (the same as used for the dust control areas of the proposed project / proposed action). The temporary access route from Staging Areas 1, 2, 3, and 4 will be approximately 13,478 feet long (2.5 miles) by 20 feet wide following the existing grade (total temporary access route disturbance area is 6 acres). The approximate location of access routes is shown in Figure 1.3.1-1.The proposed project / proposed action area can be accessed from State Route 136 via the gravel haul road and Old State Highway

Water Supply, Conveyance, and Distribution

Approximately 5 gallons of water will be applied under each straw bale prior to planting.[3] The plants would also be watered with approximately 3 gallons of water per bale immediately after the plants are placed in the ground. Total water needs during planting are expected to amount to approximately 3.02 acre-feet (985,480 gallons). It is expected that supplemental watering may be provided to the plants during the first 3 years of the proposed project / proposed action when rainfall is less than 50 percent of the average annual rainfall or is needed based on poor plant health. A total of about 5.29 acre-feet of water may be applied during the first year of the proposed project / proposed action. During each of the second, third, years of the proposed project / proposed action the estimated total annual water duty would be about 2.27 acre-feet. The total water demand for the proposed project / proposed action and proposed project / proposed action alternatives is estimated at up to 9.83 acre-feet (3.2 million gallons) over the 3-year period (Table 1.3.1-1, *Water Requirements for Proposed Project / Proposed Action*.

TABLE 1.3.1-1
WATER REQUIREMENTS FOR PROPOSED PROJECT / PROPOSED ACTION

Irrigation Event	Year	Gallons per Bale	Gallons	Acre-feet
Initial irrigation	Fall 2014	5	615,925	1.89
Irrigation at time of planting	Fall 2014	3	369,555	1.13
Supplemental #1	Spring 2015	3	369,555	1.13
Supplemental #2	Fall 2015	3	369,555	1.13
Supplemental #3	Spring 2016	3	369,555	1.13
Supplemental #4	Fall 2016	3	369,555	1.13
Supplemental #5	Spring 2017	3	369,555	1.13
Supplemental #6	Fall 2017	3	369,555	1.13
		Total	**3,203,120**	**9.83**

[3] Groeneveld, D.P., HydroBio Advanced Remote Sensing. 12 September 2012. Telephone conversation with D. Grotzinger, Sapphos Environmental, Inc., Pasadena, CA.

During the time of planting there will be two irrigation events associated with planting. The first will be conducted prior to planting to pre-wet/pre-condition the soil. The second irrigation will be conducted immediately following planting of the shrubs. Additionally, during the first year of the proposed project / proposed action, the plants may be provided with supplemental water, if needed, in the spring time when they are breaking dormancy for the growing season and again in the late summer as they go into their late season growth spurt. A decision to provide supplemental water will be based on the precipitation and the overall health of the plants.

During each of the first, second, and third years of operation of the proposed project / proposed action, there may be up to two supplemental watering events. The decision to provide supplemental water will be based on the precipitation during the year and the overall health of the plants. The potential watering events will occur in the later winter / early spring and late summer/early fall.

The proposed project / proposed action and action alternatives 1, 2, 3, and 4 assume that the water for plant irrigation will be supplied from the District's 12-inch production well, located at the Fault Test Site, located about 0.7 mile northwest of the proposed project / proposed action boundary. The Fault Test well is an artesian (flowing) well and is capable of producing 250 gallons per minute (gpm) on a sustained basis.[4] An initial application of water at each straw bale installed in the dust control areas is expected to require approximately 985,480 gallons, which would be applied over a 2- to 4-month period (this includes the pre-planting watering as well as the watering at the time of planting). The Fault Test production well can produce a sustained flow rate of 250 gpm and thus only requires a total flow of 2.7 days to produce enough water for the initial watering. Flow tests conducted at the Fault Test Site have included continuous flows for periods up to 90 days with no observed impacts to the surrounding area. Thus production of the relatively small amount of water needed for the plants on the proposed project / proposed action would not be expected to cause impacts to the local area. Another available water source includes purchased water from the Keeler Community Services District (KCSD) Well located within the southeastern portion of the proposed project / proposed action study area.[5]

Effectiveness Monitoring Program

The District is currently monitoring dust activity in the proposed project / proposed action study area with a network of 16 sand motion monitoring sites (see Figure 1.3.1-1 for Keeler Dunes monitoring sites). The monitoring program will continue to operate during and after DCM implementation. Review of sand motion monitoring, plant, and PM_{10} data will be completed at least one time per year and will be evaluated by the District to determine the progress of the proposed project / proposed action in attaining the NAAQS and state standard for PM_{10} and for the need to add supplemental plants and/or straw bales. The District will coordinate the monitoring results with the BLM.

[4] Holder, G., Great Basin Unified Air Pollution Control District, Bishop, CA. 9 October 2012. Telephone conversation with D. Grotzinger, Sapphos Environmental, Inc., Pasadena, CA.

[5] Holder, G., Great Basin Unified Air Pollution Control District, Bishop, CA. 20 September 2013. Email to Eric Charlton, Sapphos Environmental, Inc., Pasadena, CA.

1.3.2 Construction Scenario

Installation of the proposed project / proposed action would require approximately 11 months to complete. Construction of the proposed project / proposed action would be divided into the following parts: (1) temporary access routes and staging area(s), (2) bale placement and planting and watering, (3) project oversight and monitoring, and (4) supplemental watering and planting, as required. Additionally for Alternatives 3, 4, and 5 there will be installation and removal of a temporary irrigation system.

Preparation of the staging areas and access routes include brushing and grubbing Construction of the proposed project / proposed action will require a temporary disturbance of 33.1 acres. Fugitive dust emissions shall be controlled and minimized, to comply with District Rules 400 and 401 through the application of best available control measures during implementation of the proposed project / proposed action. ATVs will be restricted to travel at less than 15 miles per hour to minimize dust levels. Restoration of disturbed areas, such as staging areas and temporary access routes, would occur at the end of 3 years or when the plants are established enough such that they did not need any supplemental watering.

Supporting activities would include material delivery, planting, placement of straw bales, water delivery to plants, ongoing monitoring, and transportation of work crews. Site preparation and construction of the proposed project / proposed action would be undertaken in accordance with all federal, state, and County of Inyo building codes. A Worker Education and Awareness Plan (WEAP) and Weed Control Plan would be implemented to avoid and minimize potential impacts to resources at the proposed project / proposed action site. The contractor for the proposed project / proposed action would be required to prepare and submit these plans to the County, BLM, and the District for review and approval prior to conducting work at the proposed project / proposed action site.

Construction would be scheduled in compliance with County of Inyo regulations. Construction employees would be expected to carpool from respective population centers such as Lone Pine, Olancha, or Keeler, California, and report to the designated construction staging area prior to the beginning of each work day. It is anticipated that the employees would use SR 136 and the Gravel Haul Road and Old State Highway for ingress/egress to the proposed project / proposed action property and that, once on-site, they would access various sections by foot and ATV on the temporary access route. Workers would be present at the proposed project / proposed action site between 7:00 a.m. and 5:00 p.m., Monday through Friday. During periods of high temperature, work may begin as early as 5:00 a.m.

Up to 72 workers would be expected to be on-site during peak construction activity periods. Construction equipment would be turned off when not in use. The construction contractor would be required to ensure that all equipment is properly maintained. All vehicles would utilize exhaust mufflers and engine enclosure covers (as designed by the manufacturer) at all times.

The plans and specifications for the proposed project / proposed action would include the requirement for construction equipment and average number of hours of operation of the type specified in Table 1.3.2-1, *Dust Control Activity, Duration, Equipment, and Workers*. Table 1.3.2-1 lists the duration of each activity, types of equipment, and the maximum number of workers on the site each day.

TABLE 1.3.2-1
DUST CONTROL ACTIVITY, DURATION, EQUIPMENT, AND WORKERS

Activity	Duration (months)	Equipment	Workers (maximum)
Site preparation	~ 1 week	GrubberAll-terrain vehicle Pickup truck Trailers	10
Deliver and distribute straw bales over the dust control areas	6 to 8 months	Semi-trucks with tandem trailers Loader with forks Hay Squeeze All-terrain Vehicles	72
Planting and watering	6 to 8 months	All-terrain vehicles Loader with forks Water Trucks	72
Cleanup/restoration	~ 2 weeks	Semi-trucks with tandem trailers All-terrain vehicles Loader with forks Dozers and trailers Water trucks Pick-up trucks	20
Supplemental Watering	1 to 3 months	All-terrain vehicles Water trucks	13

Site ingress and egress locations for construction, delivery vehicles, haul routes, and emergency response and evacuation would be located at one entrance/exit road junction along Old State Highway 136 (Figure 1.3.1-1).

Once the proposed project / proposed action elements are in place, the site would be monitored regularly for a period of 3 years to evaluate the vegetation growth progress, assess plant mortality and predation, provide water according to a specified schedule, check the physical condition of straw bales, replace plants that do not survive, and supplement native vegetation in accordance with air monitoring data. Review of DCM effectiveness will be completed one time per year and will be evaluated to provide recommendations, as appropriate, for adding supplemental plants and/or straw bales as needed to achieve the NAAQS for PM_{10}.

SECTION 2.0
AIR QUALITY AND GREENHOUSE GAS EMISSIONS ANALYSIS

The analysis provided in this section evaluates the air quality and GHG emissions impact level of significance associated with the construction, operation, and maintenance activities of the proposed project / proposed action. The analysis contained herein focuses on GHG emissions and criteria pollutants designated by the federal Clean Air Act (CAA). Relevant regulatory framework is used to determine the consistency of the proposed project / proposed action with federal and state laws that govern the regulation of air quality and to determine the level of significance of the proposed project / proposed action impacts to air quality. Mitigation measures are subsequently provided to reduce air quality impacts identified to be potentially significant. The information used in this analysis is based on a review of relevant literature and technical reports (see Section 3.0, *References*, for a list of reference materials consulted). The conclusion of this analysis is supported by relevant climate data (Appendix A, *Wind and Climate Data*) and air quality modeling results (Appendix B, *CalEEMod Output for the Proposed Project / Proposed Action*).

2.1 POLLUTANTS AND THEIR EFFECTS

Criteria air pollutants are defined as pollutants that are hazardous to human health and are regulated by federal and state ambient air quality standards or criteria for outdoor concentrations. The federal and state standards have been set at levels above which concentrations would be harmful to human health and are designed to protect the most sensitive persons from illness or discomfort. Criteria pollutants of concern include carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM_{10} and $PM_{2.5}$), and lead (Pb). *Hazardous air pollutants* is a term used by the federal CAA that refers to a variety of pollutants generated or emitted by industrial production activities. Called *toxic air contaminants* (TACs) under the CAA, 10 pollutants have been identified through ambient air quality data as posing the most substantial health risk in California. On April 2, 2007, the Supreme Court in *Massachusetts, et al. v. Environmental Protection Agency, et al.* ruled that the CAA gives the U.S. Environmental Protection Agency (EPA) the authority to regulate emissions of GHGs, including carbon dioxide (CO_2); methane (CH_4); nitrous oxide (N_2O); and fluorinated gases, such as hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride,[1] thereby legitimizing GHGs as air pollutants under the CAA.

GHGs trap energy from the sun and help maintain the temperature of the Earth's surface, creating a process known as the greenhouse effect. The sun emits solar radiation and provides energy to the Earth. Six percent of the solar radiation emitted by the sun is reflected back by the atmosphere surrounding the Earth, 20 percent is scattered and reflected by clouds, 19 percent is absorbed by the atmosphere and clouds, 4 percent is reflected back to the atmosphere by the Earth's surface, and 51 percent is absorbed by the Earth. GHGs such as CO_2 and CH_4 are naturally present in the atmosphere. The presence of these gases prevents outgoing infrared radiation from escaping the Earth's surface and lower atmosphere, allowing incoming solar radiation to be absorbed by living organisms on Earth. Without these GHGs, the earth would be too cold to be habitable; however, an excess of GHGs in the atmosphere can cause global climate change by raising the Earth's temperature, resulting in environmental consequences related to snowpack losses, flood hazards, sea-level rises, and fire hazards.

[1] U.S. Supreme Court. 2 April 2007. *Massachusetts, et al. v. Environmental Protection Agency, et al.* 549 U.S. 1438; 127 S. Ct. 1438. Washington, DC.

Global climate change results from a combination of three factors: (1) natural factors, such as changes in the sun's intensity or slow changes in the Earth's orbit around the sun; (2) natural processes within the Earth's climate system, such as changes in ocean circulation; and (3) anthropogenic activities, such as fossil fuel combustion, deforestation, reforestation, urbanization, and desertification, that change the composition of atmospheric gases. In its 2007 climate change synthesis report to policy makers, the Intergovernmental Panel on Climate Change (IPCC) concluded, "Global GHG emissions due to human activities have grown since pre-industrial times, with an increase of 70 percent between 1970 and 2004."[2] Therefore, significant attention is being given to the anthropogenic causes of the increased GHG emissions level. In review of regulatory publications from the California Air Pollution Control Officers Association (CAPCOA),[3,4] the California Air Resources Board (CARB),[5] the California Attorney General,[6] and the Governor's Office of Planning and Research (OPR),[7] there is a consensus on the close association between fossil fuel combustion, in conjunction with other human activities, and GHG emissions.

In the United States, from 1990 through 2009, the total GHG emissions rose 7.3 percent and were largely contributed by CO_2 from fossil fuel combustion from the electricity generation sector, which was responsible for 30 and 33 percent of 1990 and 2009 GHG emissions nationwide.[8] After the electricity generation sector followed the transportation sector, which was responsible for 25 and 27 percent of nationwide 1990 and 2009 GHG emissions; the industrial sector, which was responsible for 25 and 20 percent of nationwide 1990 and 2009 GHG emissions; and the agriculture sector, which was responsible for 0.07 percent of nationwide emissions in both 1990 and 2009.[9] In California, GHG emissions are largely contributed by the transportation sector, which was responsible for 35 and 38 percent of 1990 and 2004 GHG emissions statewide, respectively. After transportation followed the electricity generation sector, which was responsible for 25 percent of statewide emissions in both 1990 and 2004; the industrial sector, which was responsible for 24 and 20 percent of statewide 1990 and 2004 GHG emissions; and the

[2] Intergovernmental Panel on Climate Change. Approved 12–17 November 2007. *Climate Change 2007: Synthesis Report, Summary for Policymakers*, p. 5. Valencia, Spain. Available at: http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf

[3] California Air Pollution Control Officers Association. January 2008. *CEQA and Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act*. Sacramento, CA.

[4] California Air Pollution Control Officers Association. August 2010. *Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emissions Reduction from Greenhouse Gas Mitigation Measures*. Sacramento, CA.

[5] California Air Resources Board. 24 October 2008. *Preliminary Draft Staff Proposal: Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the California Environmental Quality Act*. Sacramento, CA. Available at: http://www.opr.ca.gov/ceqa/pdfs/Prelim_Draft_Staff_Proposal_10-24-08.pdf

[6] California Department of Justice, Office of the Attorney General. Updated 9 December 2008. *The California Environmental Quality Act Addressing Global Warming Impacts at the Local Agency Level*. Sacramento, CA.

[7] California Governor's Office of Planning and Research. 19 June 2008. *CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act (CEQA) Review*. Technical Advisory. Sacramento, CA.

[8] U.S. Environmental Protection Agency. 5 August 2011. *Fast Facts: Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990–2009*. Washington, DC. Available at: http://epa.gov/climatechange/emissions/downloads11/GHG-Fast-Facts-2009.pdf

[9] U.S. Environmental Protection Agency. 5 August 2011. *Fast Facts: Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990–2009*. Washington, DC. Available at: http://epa.gov/climatechange/emissions/downloads11/GHG-Fast-Facts-2009.pdf

commercial sector, which was responsible for 3 percent of statewide emissions in both 1990 and 2004.[10]

A detailed description of the characteristics and effects of criteria pollutants and GHGs is provided in the following sections to contextualize the analysis.

2.1.1 Carbon Monoxide

CO is a colorless, odorless gas formed by the incomplete combustion of fossil fuels. CO is emitted almost exclusively from motor vehicles, power plants, refineries, industrial boilers, ships, aircrafts, and trains. In urban areas, automobile exhaust accounts for the majority of CO emissions. CO is a nonreactive air pollutant that dissipates relatively quickly; therefore, ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. CO concentrations are influenced by local meteorological conditions, including wind speed, topography, and atmospheric stability. CO produced by motor vehicle exhaust can be locally concentrated when surface-based temperature inversions are combined with calm atmospheric conditions, such as situations at dusk in urban areas between November and February.[11] The highest levels of CO typically occur during the colder months of the year when inversion conditions are more frequent. CO has a higher binding affinity to hemoglobin than atmospheric oxygen (O_2), so it can replace O_2 in the blood and reduce the ability of blood to transport O_2 to vital organs. Low CO concentrations can cause fatigue in healthy persons and chest pain in persons with heart disease. At moderate concentrations, CO can cause angina, impaired vision, and reduced brain function. At high concentrations, CO can cause impaired vision and coordination, headaches, dizziness, confusion, and nausea. At very high concentrations, CO exposure can be fatal.

2.1.2 Volatile Organic Compounds

Volatile organic compounds (VOCs; also known as reactive organic gases, ROGs) include any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, and it excludes a list of organic compounds that are considered to be non- or low-reactive organic gases that are not considered to be precursors to the formation of atmospheric ozone. The U.S. EPA and CARB maintain separate but similar lists of organic gases that are excluded as regulated VOCs, or ROGs as termed by CARB.[12] VOCs are emitted from incomplete combustion of hydrocarbons or other carbon-based fuels. Combustion engine exhaust, oil refineries, and oil-fueled power plants are the primary sources of hydrocarbons. Another source of hydrocarbons is evaporation from petroleum fuels, solvents, dry-cleaning solutions, and paint.

The primary health effects of hydrocarbons result from the formation of O_3 and its related health effects (see Section 2.1.3, *Ozone*). High levels of hydrocarbons in the atmosphere can interfere with oxygen intake by reducing the amount of available oxygen through displacement. There are no separate federal or California ambient air quality standards for VOCs. Carcinogenic forms of

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[10] California Air Resources Board. 16 November 2007. *California 1990 Greenhouse Gas Emissions Level and 2020 Limit.* Sacramento, CA.

[11] Inversion is an atmospheric condition in which a layer of warm air traps cooler air near the surface of the earth, preventing the normal rising of surface air.

[12] California Air Resources Board, Planning and Technical Support Division, Emission Inventory Branch. Revised January 2009. "Definitions of VOC and ROG." Sacramento, CA. Available at: http://www.arb.ca.gov/ei/speciate/voc_rog_dfn_1_09.pdf

VOCs are considered TACs. An example is benzene, which is a carcinogen. The health effects of individual VOCs are described in Section 2.1.16.

2.1.3 Ozone

O_3 is a colorless gas that is formed in the atmosphere when VOCs and nitrogen oxides (NO_x), react in the atmosphere in the presence of ultraviolet sunlight. The primary sources of VOCs and NO_x are automobile exhaust emissions and industrial emissions. Ideal conditions for O_3 formation occur during summer and early fall on days with low wind speeds or stagnant air, warm temperatures, and cloudless skies. O_3 is one of the main components of photochemical smog in urban areas. Health effects associated with exposure to O_3 include increased respiratory and cardiovascular disease; increased symptoms of respiratory illness such as cough, phlegm, and wheeze; decreased lung function; increased bronchodilator usage; and increased daily mortalities.

2.1.4 Nitrogen Dioxide

NO_2 is a highly reactive, brownish-red gas that plays a major role in the formation of ground-level O_3 and acid rain. NO_2 is produced in the atmosphere from the reaction of O_2 with nitric oxide (NO). NO_x collectively refers to both NO and NO_2. The main sources of NO_2 include fuel combustion in industry and motor vehicles. High concentrations of NO_2 can cause breathing difficulties and can result in a brownish-red cast to the atmosphere with reduced visibility. NO_2 is toxic to various animals and to humans because it can react with water to form nitric acid in the eyes, lungs, mucus membranes, and skin. Epidemiological studies have shown associations between NO_2 concentrations and chronic pulmonary fibrosis and daily mortalities from respiratory and cardiovascular causes. Some increase in bronchitis in children (2 and 3 years old) has also been observed at concentrations below 0.3 parts per million (ppm).

2.1.5 Sulfur Dioxide

SO_2 is a colorless, pungent gas formed primarily by the combustion of sulfur-containing fossil fuels. Generally, the highest levels of SO_2 are found near large industrial complexes where coal and oil are used in power plants and industries. In recent years, SO_2 concentrations have been reduced due to the increasingly stringent controls placed on stationary source emissions of SO_2 and limits on the sulfur content of fuels. SO_2 causes its irritant effects by stimulating nerves in the lining of the nose and throat and the lung's airways. This causes a reflex cough, irritation, and a feeling of chest tightness, which may lead to narrowing of the airways. Acute respiratory symptoms and diminished ventilator function in children can be caused by SO_2 emissions, which can also damage plants and erode metals. When SO_2 and NO_x react with water, oxygen, and oxidants, they form acidic compounds that can be deposited as dry particulate matter or in the wet form as acid rain, snow, or fog. Acid rain harms lakes, streams, trees, crops, and historic buildings and monuments.[13]

2.1.6 Particulate Matter

Particulate matter (PM) consists of very small liquid and solid particles suspended in air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter can be formed when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. Fine particulate matter ($PM_{2.5}$) refers to particles that are 2.5 microns or less in diameter, which is

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[13] U.S. Environmental Protection Agency. Updated 11 June 2013. "Sulfur Dioxide (SO_2)—NAAQS Implementation." Washington, DC. Available at: http://www.epa.gov/ttn/naaqs/so2/index.html

roughly 1/28th the diameter of a human hair. PM_{10} refers to particles that are 10 microns or less in diameter, which is about 1/7th the thickness of a human hair. Primary sources of $PM_{2.5}$ emissions include fuel combustion from motor vehicles, power generation, industrial facilities, residential fireplaces, and wood stoves. In addition, $PM_{2.5}$ can be formed in the atmosphere from gases such as SO_2, NO_x, and VOCs. Major sources of PM_{10} include crushing or grinding operations; dust stirred up by vehicles traveling on roads; wood-burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning activities; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions.

$PM_{2.5}$ and PM_{10} pose a greater health risk than larger-sized particles. When inhaled, small particles can penetrate the natural defenses of the human respiratory system and damage the respiratory tract. Elevated particulate levels have been strongly linked to premature deaths, hospital admissions, emergency room visits, and asthma attacks;[14] particulate matter inhalations can also significantly reduce development of lung function in children.[15] In addition, inhalation of increased level of PM_{10} can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infection.[16] Of greatest concern are recent studies that link PM_{10} exposure to the premature death of people who have preexisting heart and lung disease, especially the elderly. Components of PM can include substances such as Pb, sulfates (SO_4), and nitrates, which can cause lung damage directly; they can also be absorbed into the bloodstream and cause damage elsewhere in the body. Moreover, these substances can transport absorbed gases, such as chlorides or ammonium, into the lungs and cause injury. PM_{10} tends to collect in the upper portion of the respiratory system, whereas $PM_{2.5}$ can penetrate deeper into the lungs and damage lung tissues. Suspended particulates also damage and discolor surfaces on which they settle and produce haze in the atmosphere that reduces regional visibility.

2.1.7 Lead

Pb in the atmosphere occurs as PM. Main sources of Pb emissions include leaded gasoline, battery manufacture, paint, ink, ceramics, ammunition, and secondary Pb smelters. Prior to 1978, mobile emissions were the primary source of atmospheric Pb. After the phase-out of leaded gasoline between 1978 and 1987, secondary Pb smelters, battery recycling, and manufacturing facilities became Pb emission sources of greater concern. Prolonged exposure to atmospheric Pb poses a serious threat to human health, effects of which include gastrointestinal disturbances, anemia, kidney disease, and, in severe cases, neuromuscular and neurological dysfunction. Infants and young children are particularly sensitive, even to very low levels of Pb, and such exposure could result in decrements in neurobehavioral performance, including intelligence quotient performance, psychomotor performance, reaction time, and growth.

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[14] California Air Resources Board. November 2007. *Recent Research Findings: Health Effects of Particulate Matter and Ozone Air Pollution, November 2007*. Sacramento, CA. Available at: http://www.arb.ca.gov/research/health/fs/pm_ozone-fs.pdf

[15] California Air Resources Board. November 2007. *Recent Research Findings: Health Effects of Particulate Matter and Ozone Air Pollution, November 2007*. Sacramento, CA. Available at: http://www.arb.ca.gov/research/health/fs/pm_ozone-fs.pdf

[16] Great Basin Unified Air Pollution Control District. Accessed 4 January 2012. *Particular Matter Air Pollution*. Bishop, CA. Available at: http://www.gbuapcd.org/pm10.htm

2.1.8 Sulfates

Sulfates (SO_4^{2-}) are particulate products of combustion of sulfur-containing fossil fuels. When SO or SO_2 are exposed to oxygen they precipitate out into sulfates (SO_3 or SO_4). Sulfates are the fully oxidized ionic form of sulfur. Sulfates occur in combination with metal and/or hydrogen ions. In California, emissions of sulfur compounds occur primarily from the combustion of petroleum-derived fuels (that is, gasoline and diesel fuel) that contain sulfur. This sulfur is oxidized to sulfur dioxide (SO_2) during the combustion process and is subsequently converted to sulfate compounds in the atmosphere. The conversion of SO_2 to sulfates takes place relatively rapidly and completely in urban areas of California due to regional meteorological features. CARB's sulfates standard is designed to prevent aggravation of respiratory symptoms. Effects of sulfate exposure at levels above the standard include a decrease in ventilatory function, aggravation of asthmatic symptoms, and an increased risk of cardiopulmonary disease. Sulfates are particularly effective in degrading visibility and, because they are usually acidic, can harm ecosystems and damage materials and property.[17] See also acid rain in Section 2.1.5.

2.1.9 Hydrogen Sulfide

Hydrogen sulfide (H_2S) is associated with geothermal activity, oil and gas production, refining, sewage treatment plants, and confined animal feeding operations.

Exposure to low concentrations of H_2S may irritate the eyes, nose, and throat. It may also cause difficulty in breathing for some asthmatics. Exposure to higher concentrations (above 100 ppm) of H_2S can cause olfactory fatigue, respiratory paralysis, and death. Brief exposures to high concentrations of H_2S (greater than 500 ppm) can cause a loss of consciousness. In most cases, the person appears to regain consciousness without any other effects. However, in many individuals, there may be permanent or long-term effects, such as headaches, poor attention span, poor memory, and poor motor function. No health effects have been found in humans exposed to typical environmental concentrations of H_2S (0.00011 to 0.00033 ppm). Deaths due to inhaling large amounts of H_2S have been reported in a variety of different work settings, including sewers, animal processing plants, waste dumps, sludge plants, oil and gas well drilling sites, and tanks and cesspools.

2.1.10 Visibility-Reducing Particles

This standard is a measure of visibility. Visibility is often characterized by visual range (VR). VR is the maximum distance at which a person can barely perceive a dark object. The ability to perceive an object is determined by the difference in contrast between the object and the background. A 2 percent contrast is considered barely perceptible, but typically at least a 5 percent change in contrast is needed. The less water vapor, sea salt particulate, and pollutants in the air, the greater the VR. VRs of up to about 150 miles (240 kilometers) can occur in clean desert areas where there is very low relative humidity. In coastal regions, the occurrence of sea salt particulate and water vapor can significantly reduce the maximum VR that could occur. The CARB does not yet have a measurement method that is accurate or precise enough to designate areas in the state as being in attainment or nonattainment. The entire state is unclassified.

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[17] California Air Resources Board. Updated 24 November 2009. "History of Sulfates Air Quality Standard." Sacramento, CA. Available at: http://www.arb.ca.gov/research/aaqs/caaqs/sulf-1/sulf-1.htm

2.1.11 Vinyl Chloride

Vinyl chloride monomer is a sweet smelling, colorless gas at ambient temperature. Landfills, publicly owned treatment works, and polyvinyl chloride (PVC) production are the major identified sources of vinyl chloride emissions in California. PVC can be fabricated into several products, such as pipes, pipefittings, and plastics. In humans, epidemiological studies of occupationally exposed workers have linked vinyl chloride exposure to development of liver angiosarcoma, which is a rare cancer, and have suggested a relationship between exposure and cancers of the lung and brain. There are currently no adopted ambient air standards for vinyl chloride.

Acute exposure of humans to high levels of vinyl chloride via inhalation in humans has resulted in effects on the central nervous system, such as dizziness, drowsiness, headaches, and giddiness.

Vinyl chloride is reported to be slightly irritating to the eyes and respiratory tract in humans. Acute exposure to extremely high levels of vinyl chloride has caused loss of consciousness, irritation to the lungs and kidneys, and inhibition of blood clotting in humans; and cardiac arrhythmias in animals.

Tests involving acute exposure of mice to vinyl chloride have shown a high acute toxicity from inhalation exposure to the substance. Long-term exposure to vinyl chloride concentrations has been linked with chronic health effects:[18,19]

- Liver damage may result in humans from chronic exposure to vinyl chloride through both inhalation and oral exposure.
- A small percentage of individuals occupationally exposed to high levels of vinyl chloride in the air have developed a set of symptoms termed *vinyl chloride disease*, which is characterized by Raynaud's phenomenon (fingers blanch and numbness and discomfort are experienced upon exposure to the cold), changes in the bones at the end of the fingers, joint and muscle pain, and scleroderma-like skin changes (thickening of the skin, decreased elasticity, and slight edema).
- Central nervous system effects (including dizziness, drowsiness, fatigue, headache, visual and/or hearing disturbances, memory loss, and sleep disturbances), as well as peripheral nervous system symptoms (peripheral neuropathy, tingling, numbness, weakness, and pain in fingers) have also been reported in workers exposed to vinyl chloride.

Several reproductive/developmental health effects from vinyl chloride exposure have been identified:[20,21]

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[18] Agency for Toxic Substances and Disease Registry. Updated 2006. "Toxicological Profile for Vinyl Chloride." Atlanta, GA.

[19] U.S. Environmental Protection Agency. Updated 6 November 2007. Technology Transfer Network Air Toxics Web Site: "Vinyl Chloride." Washington, DC. Available at: http://www.epa.gov/ttn/atw/hlthef/vinylchl.html

[20] Agency for Toxic Substances and Disease Registry. Updated 2006. "Toxicological Profile for Vinyl Chloride." Atlanta, GA.

[21] U.S. Environmental Protection Agency. Updated 6 November 2007. Technology Transfer Network Air Toxics Web Site: "Vinyl Chloride." Washington, DC. Available at: http://www.epa.gov/ttn/atw/hlthef/vinylchl.html

- Several case reports suggest that male sexual performance may be affected by vinyl chloride. However, these studies are limited by lack of quantitative exposure information and possible co-occurring exposure to other chemicals.

- Several epidemiological studies have reported an association between vinyl chloride exposure in pregnant women and an increased incidence of birth defects, while other studies have not reported similar findings.

- Epidemiological studies have suggested an association between men occupationally exposed to vinyl chloride and miscarriages in their wives' pregnancies, although other studies have not supported these findings.

- Long-term exposure to vinyl chloride has also been identified as a cancer risk:

  - Inhaled vinyl chloride has been shown to increase the risk of a rare form of liver cancer (angiosarcoma of the liver) in humans.

  - Animal studies have shown that vinyl chloride, via inhalation, increases the incidence of angiosarcoma of the liver and cancer of the liver.

2.1.12 Carbon Dioxide

CO_2 is a colorless, odorless, and nonflammable gas that is the most abundant GHG in the earth's atmosphere after water vapor. CO_2 enters the atmosphere through natural processes, such as respiration and forest fires, and through human activities such as the burning of fossil fuels (oils, natural gas, and coal) and solid waste, deforestation, and industrial processes. CO_2 absorbs terrestrial infrared radiation that would otherwise escape to space, and therefore plays an important role in atmospheric warming. CO_2 has an atmospheric lifetime of up to 200 years and, therefore, is a more important GHG than water vapor, which has an atmospheric residence time of only a few days. CO_2 provides the reference point for the global warming potential (GWP) of other gases; thus, the GWP of CO_2 is equal to 1. Global warming potential (GWP) is a relative measure of how much heat a greenhouse gas traps in the atmosphere.

2.1.13 Methane

Methane (CH_4) is a principal component of natural gas and consists of a single carbon atom bonded to four hydrogen atoms. It is formed and released to the atmosphere by biological processes from livestock and other agricultural practices and by the decay of organic waste in anaerobic environments such as municipal solid waste landfills. CH_4 is also emitted during the production and transport of coal, natural gas, and oil. CH_4 is about 21 times more powerful at warming the atmosphere than CO_2 (GWP of 21).

The chemical lifetime of CH_4 in the atmosphere is approximately 12 years. The relatively short atmospheric lifetime of CH_4, coupled with its potency as a GHG, makes it a candidate for mitigating global warming over the short term. CH_4 can be removed from the atmosphere by a variety of processes, such as the oxidation reaction with hydroxyl radicals (OH), microbial uptake in soils, and reaction with chlorine (Cl) atoms in the marine boundary layer.

2.1.14 Nitrous Oxide

N_2O is a clear, colorless gas with a slightly sweet odor. N_2O has a long atmospheric lifetime (approximately 120 years) and heat-trapping effects about 310 times more powerful than CO_2 on a per molecule basis (a GWP of 310). N_2O is produced by both natural and human-related sources. The primary anthropogenic sources of N_2O are agricultural soil management-like soil cultivation practices, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuels, and production of adipic and nitric acids. The natural process of producing N_2O ranges from a wide variety of biological sources in soil and water, particularly microbial action in wet tropical forests.

2.1.15 Fluorinated Gases

Hydrofluorocarbons (HFCs), perfluorocarbons, and sulfur hexafluoride are powerful synthetic GHGs that are emitted from a variety of industrial processes, including aluminum production, semiconductor manufacturing, electric power transmission, magnesium production and processing, and the production of chlorodifluoromethane (HCFC-22). Fluorinated gases are being used as substitutes for ozone-depleting chlorofluorocarbons (CFCs). Fluorinated gases are typically emitted in small quantities; however, they have high GWPs of between 140 and 23,900.[22]

2.1.16 Toxic Air Contaminants

Toxic air contaminants (TACs) are airborne pollutants that potentially pose a hazard to human health or may be expected to result in an increased rate of mortality or serious illness. Direct exposure to these pollutants has been shown to cause cancer, birth defects, damage to brain and nervous system, and respiratory disorders. In addition, effects from TACs may be both chronic and acute on human health. Acute health effects are attributable to sudden exposure to high quantities of air toxics. These effects include nausea, skin irritation, respiratory illness, and, in some cases, death. Chronic health effects result from low-dose, long-term exposure from routine releases of air toxics. The effect of major concern for this type of exposure is cancer, which requires a period of 10–30 years after exposure to develop.[23]

Hazardous air pollutants is a term used by the federal CAA that includes a variety of pollutants generated or emitted by industrial production activities. Called TACs under the CAA, 10 pollutants have been identified in the Toxic Air Contaminant Identification List through ambient air quality data as posing the most substantial health risk in California.[24] In 1998, California identified diesel engine PM (diesel PM or soot) as a TAC based on its potential to cause cancer, premature death, and other health problems.[25] Sources for diesel PM include exhaust from vehicles, diesel engines, and diesel-powered portable equipment. According to the CARB, diesel exhaust is a complex mixture of gases, vapors, and fine particles. This complexity makes the evaluation of health effects of diesel exhaust a complex scientific issue. Some of the chemicals in diesel exhaust, such as

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[22] California Climate Action Registry. January 2009. *California Climate Action Registry General Reporting Protocol, Version 3.1*. Los Angeles, CA.

[23] California Air Resources Board. Updated 30 March 2012. *Air Quality Analysis Guidance Handbook*. Sacramento, CA. Available at: http://www.aqmd.gov/ceqa/hdbk.html

[24] California Air Resources Board. 18 July 2011. *Toxic Air Contaminant Identification List*. Sacramento, CA. Available at: http://www.arb.ca.gov/toxics/id/taclist.htm

[25] California Air Resources Board. 25 January 2010. *Diesel Programs and Activities*. Sacramento, CA. Available at: http://www.arb.ca.gov/diesel/diesel.htm

benzene and formaldehyde, have been previously identified as TACs by the CARB, and are listed as carcinogens either under the State's Proposition 65 or under the federal Hazardous Air Pollutants programs. California has adopted a comprehensive diesel risk reduction program. The U.S. EPA has adopted low-sulfur diesel fuel standards that will reduce diesel particulate matter substantially. These programs went into effect in June 2006.

In 1991, the District Board made a policy decision to make the state Air Toxics "Hot Spots" Information and Assessment Act (Act; AB 2588, 1987),[26] which is a state law requiring sources of toxics to do plans, inventories, source tests, and reports, a low priority for staff enforcement.[27]

TACs do not have ambient air quality standards since no safe levels of TACs can be determined. Instead, TAC impacts are evaluated by calculating the health risks associated with a given exposure. The requirements of the Act apply to facilities that use, produce, or emit toxic chemicals. Facilities that are subject to the toxic emission inventory requirements of the Act must prepare and submit toxic emission inventory plans and reports and periodically update those reports.

2.1.16.1 Health Effects and Risks of Toxic Air Contaminants

2.1.16.1.1 Acetaldehyde

Acetaldehyde is classified as a federal hazardous air pollutant and as a California TAC. Acetaldehyde is a carcinogen that also causes chronic non-cancer toxicity in the respiratory system. Symptoms of chronic intoxication of acetaldehyde in humans resemble those of alcoholism.

The primary acute effect of inhalation exposure to acetaldehyde is irritation of the eyes, skin, and respiratory tract in humans. At higher exposure levels, erythema, coughing, pulmonary edema (fluid in lungs), and necrosis may also occur. Acute inhalation of acetaldehyde resulted in a depressed respiratory rate and elevated blood pressure in experimental animals. Tests involving acute exposure of rats, rabbits, and hamsters have demonstrated acetaldehyde to have low acute toxicity from inhalation and moderate acute toxicity from oral or dermal exposure.[28]

2.1.16.1.2 Benzene

Benzene is highly carcinogenic and occurs throughout California. Benzene also has non-cancer-related health effects. Brief inhalation exposure to high concentrations can cause central nervous system depression. Acute effects include central nervous system symptoms of nausea, tremors, drowsiness, dizziness, headache, intoxication, and unconsciousness.[29]

Neurological symptoms of inhalation exposure to benzene include drowsiness, dizziness, headaches, and unconsciousness in humans. Ingestion of large amounts of benzene may result in vomiting, dizziness, and convulsions in humans. Exposure to benzene in liquid and vapor form

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[26] California Air Resources Board. 25 April 2011. *AB 2588 Air Toxics "Hot Spots" Program*. Sacramento, CA. Available at: http://www.arb.ca.gov/ab2588/ab2588.htm

[27] Great Basin Unified Air Pollution District. Accessed 4 January 2012. *Major Past Policy Decisions*. Bishop, CA. Available at: http://www.gbuapcd.org/background.htm

[28] U.S. Environmental Protection Agency. Revised January 2000. Technology Transfer Network Air Toxics Web Site: "Acetaldehyde." Washington, DC. Available at: http://www.epa.gov/ttn/atw/hlthef/acetalde.html

[29] U.S. Environmental Protection Agency. Revised January 2000. Technology Transfer Network Air Toxics Web Site: "Benzene." Washington, DC. Available at: http://www.epa.gov/ttn/atw/hlthef/benzene.html

may irritate the skin, eyes, and upper respiratory tract in humans. Redness and blisters may result from dermal exposure to benzene.

Chronic inhalation of certain levels of benzene causes blood disorders in humans; specifically, benzene affects bone marrow (the tissues that produce blood cells). Aplastic anemia, excessive bleeding, and damage to the immune system (by changes in blood levels of antibodies and loss of white blood cells) may develop. Increased incidence of leukemia (cancer of the tissues that form white blood cells) has been observed in humans who have been occupationally exposed to benzene.[30]

2.1.16.1.3 1,3-Butadiene

1,3-butadiene has been identified as a carcinogen in California. At very high levels, butadiene vapors cause neurological effects, such as blurred vision, fatigue, headache, and vertigo. Dermal exposure of humans to 1,3-butadiene causes a sensation of cold, followed by a burning sensation, which may lead to frostbite.[31]

One epidemiological study reported that chronic (long-term) exposure to 1,3-butadiene by inhalation resulted in an increase in cardiovascular diseases, such as rheumatic and arteriosclerotic heart diseases, while other human studies have reported effects on the blood. A large epidemiological study of synthetic rubber industry workers demonstrated a consistent association between 1,3-butadiene exposure and occurrence of leukemia. Several epidemiological studies of workers in styrene-butadiene rubber factories have shown an increased incidence of respiratory, bladder, stomach, and lymphato-hematopoietic cancers. However, these studies are not sufficient to determine a causal association between 1,3-butadiene exposure and cancer, due to possible exposure to other chemicals and other confounding factors.[32]

2.1.16.1.4 Carbon Tetrachloride

Carbon tetrachloride is a central nervous system depressant, which the U.S. EPA has classified as Group B2, a probable human carcinogen.[33]

Acute inhalation and oral exposures to high levels of carbon tetrachloride have been observed primarily to damage the liver (swollen, tender liver, changes in enzyme levels, and jaundice) and kidneys (nephritis, nephrosis, and proteinurea) of humans. Depression of the central nervous system has also been reported. Symptoms of acute exposure in humans include headache, weakness, lethargy, nausea, and vomiting. Delayed pulmonary edema has been observed in humans who have been exposed to high levels of carbon tetrachloride by inhalation and ingestion, but this is believed to be due to injury to the kidney rather than direct action of carbon

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[30] U.S. Environmental Protection Agency. Revised January 2000. Technology Transfer Network Air Toxics Web Site: "Benzene." Washington, DC. Available at: http://www.epa.gov/ttn/atw/hlthef/benzene.html

[31] U.S. Environmental Protection Agency. Revised March 2009. Technology Transfer Network Air Toxics Web Site: "1,3-butadiene." Washington, DC. Available at: http://www.epa.gov/ttn/atw/hlthef/butadien.html

[32] U.S. Environmental Protection Agency. Revised March 2009. Technology Transfer Network Air Toxics Web Site: "1,3-butadiene." Washington, DC. Available at: http://www.epa.gov/ttn/atw/hlthef/butadien.html

[33] U.S. Environmental Protection Agency. Revised January 2000. Technology Transfer Network Air Toxics Web Site: "Carbon Tetrachloride." Washington, DC. Available at: http://www.epa.gov/ttn/atw/hlthef/carbonte.html

tetrachloride on the lung. Chronic inhalation or oral exposure to carbon tetrachloride produces liver and kidney damage in humans and animals.[34]

2.1.16.1.5 Hexavalent Chromium

In California, hexavalent chromium has been identified as a carcinogen. Epidemiological evidence suggests that exposure to inhaled hexavalent chromium may result in lung cancer.

The respiratory tract is the major target organ for chromium (VI) following inhalation exposure in humans. Other effects noted from acute inhalation exposure to very high concentrations of chromium (VI) include gastrointestinal and neurological effects, while dermal exposure causes skin burns in humans. Chronic inhalation exposure to chromium (VI) in humans results in effects on the respiratory tract, with perforations and ulcerations of the septum, bronchitis, decreased pulmonary function, pneumonia, asthma, and nasal itching and soreness reported. Chronic human exposure to high levels of chromium (VI) by inhalation or oral exposure may produce effects on the liver, kidney, gastrointestinal and immune systems, and possibly in the blood.[35]

2.1.16.1.6 Para-dichlorobenzene

In California, para-dichlorobenzene has been identified as a carcinogen. Acute exposure to 1,4-dichlorobenzene via inhalation in humans results in irritation to the eyes, skin, and throat. In addition, long-term inhalation exposure may affect the liver, skin, and central nervous system in humans (for example, cerebellar ataxia, dysarthria, weakness in limbs, and hyporeflexia).[36]

2.1.16.1.7 Formaldehyde

The major toxic effects caused by acute formaldehyde exposure via inhalation are eye, nose, and throat irritation and effects on the nasal cavity. Other effects seen from exposure to high levels of formaldehyde in humans are coughing, wheezing, chest pains, and bronchitis. Chronic exposure to formaldehyde by inhalation in humans has been associated with respiratory symptoms and irritation of the eye, nose, and throat. Animal studies have reported effects on the nasal respiratory epithelium and lesions in the respiratory system from chronic inhalation exposure to formaldehyde.

Occupational studies have noted statistically significant associations between exposure to formaldehyde and increased incidence of lung and nasopharyngeal cancer. This evidence is considered to be “limited,” rather than “sufficient,” due to possible exposure to other agents that may have contributed to the excess cancers. The U.S. EPA considers formaldehyde to be a probable human carcinogen and has ranked it in the U.S. EPA’s Group B1.[37] In California, formaldehyde has been identified as a carcinogen.

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[34] U.S. Environmental Protection Agency. Revised January 2000. Technology Transfer Network Air Toxics Web Site: “Carbon Tetrachloride.” Washington, DC. Available at: http://www.epa.gov/ttn/atw/hlthef/carbonte.html

[35] U.S. Environmental Protection Agency. Revised January 2000. Technology Transfer Network Air Toxics Web Site: “Chromium Compounds.” Washington, DC. Available at: http://www.epa.gov/ttn/atw/hlthef/chromium.html#ref1

[36] U.S. Environmental Protection Agency. Revised January 2000. Technology Transfer Network Air Toxics Web Site: “1,4-Dichlorobenzene (para-Dichlorobenzene).” Washington, DC. Available at: http://www.epa.gov/ttn/atw/hlthef/dich-ben.html

[37] U.S. Environmental Protection Agency. Revised January 2000. Technology Transfer Network Air Toxics Web Site: “Formaldehyde.” Washington, DC. Available at: http://www.epa.gov/ttn/atw/hlthef/formalde.html

2.1.16.1.8 Methylene Chloride

Case studies of methylene chloride poisoning during paint stripping operations have demonstrated that inhalation exposure to extremely high levels of methylene chloride can be fatal to humans. Acute inhalation exposure to high levels of methylene chloride in humans has affected the central nervous system including decreased visual, auditory, and psychomotor functions, but these effects are reversible once exposure ceases. Methylene chloride also irritates the nose and throat at high concentrations. The major effects from chronic inhalation exposure to methylene chloride in humans are effects on the central nervous system, such as headaches, dizziness, nausea, and memory loss. In addition, chronic exposure can lead to bone marrow, hepatic, and renal toxicity. The U.S. EPA considers methylene chloride to be a probable human carcinogen and has ranked it in U.S. EPA's Group B2.[38] The State of California considers methylene chloride to be a carcinogen.

2.1.16.1.9 Perchloroethylene

In California, perchloroethylene has been identified as a carcinogen. Perchloroethylene vapors are irritating to the eyes and respiratory tract. Following chronic exposure, workers have shown signs of liver toxicity, as well as kidney dysfunction, and neurological disorders.[39]

2.1.16.1.10 Diesel Particulate Matter

Diesel exhaust and many individual substances contained in it (including arsenic, benzene, formaldehyde, and nickel) have the potential to contribute to mutations in cells that can lead to cancer. Long-term exposure to diesel exhaust particles poses the highest cancer risk of any TAC evaluated by the California Office of Environmental Health Hazard Assessment (OEHHA). CARB estimates that about 70 percent of the cancer risk that the average Californian faces from breathing TACs stems from diesel exhaust particles.

In its comprehensive assessment of diesel exhaust, OEHHA analyzed more than 30 studies of people who worked around diesel equipment, including truck drivers, railroad workers, and equipment operators. The studies showed these workers were more likely than workers who were not exposed to diesel emissions to develop lung cancer. These studies provide strong evidence that long-term occupational exposure to diesel exhaust increases the risk of lung cancer. Using information from OEHHA's assessment, CARB estimates that diesel-particle levels measured in California's air in 2000 could cause 540 "excess" cancers (beyond what would occur if there were no diesel particles in the air) in a population of 1 million people over a 70-year lifetime.

Other researchers and scientific organizations, including the National Institute for Occupational Safety and Health, have calculated similar cancer risks from diesel exhaust as those calculated by OEHHA and CARB.[40]

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[38] U.S. Environmental Protection Agency. Revised January 2000. Technology Transfer Network Air Toxics Web Site: "Methylene Chloride (Dichloromethane)." Washington, DC. Available at: http://www.epa.gov/ttn/atw/hlthef/methylen.html

[39] U.S. Environmental Protection Agency. Revised January 2000. Technology Transfer Network Air Toxics Web Site: "Tetrachloroethylene (Perchloroethylene)." Washington, DC. Available at: httphttp://www.epa.gov/ttn/atw/hlthef/tet-ethy.html

[40] California Environmental Protection Agency, Office of Environmental Health Hazard Assessment, and the American Lung Association. Accessed on 2 February 2010. "Health Effects of Diesel Exhaust." Sacramento, CA. Available at: http://www.oehha.org/public_info/facts/dieselfacts.html

Exposure to diesel exhaust can have immediate health effects. Diesel exhaust can irritate the eyes, nose, throat and lungs, and it can cause coughs, headaches, lightheadedness, and nausea. In studies with human volunteers, diesel exhaust particles made people with allergies more susceptible to the materials to which they are allergic, such as dust and pollen. Exposure to diesel exhaust also causes inflammation in the lungs, which may aggravate chronic respiratory symptoms and increase the frequency or intensity of asthma attacks.

Diesel engines are a major source of fine-particle pollution. The elderly and people with emphysema, asthma, and chronic heart and lung disease are especially sensitive to fine-particle pollution. Numerous studies have linked elevated particle levels in the air to increased hospital admissions, emergency room visits, asthma attacks, and premature deaths among people suffering from respiratory problems. Because children's lungs and respiratory systems are still developing, they are also more susceptible than healthy adults to fine particles. Exposure to fine particles is associated with increased frequency of childhood illnesses and can reduce lung function in children. In California, diesel exhaust particles have been identified as carcinogens.

2.1.16.1.11 Arsenic

Arsenic, a naturally occurring element, is found throughout the environment; for most people, food is the major source of exposure. Acute (short-term) high-level inhalation exposure to arsenic dust or fumes has resulted in gastrointestinal effects (nausea, diarrhea, abdominal pain); central and peripheral nervous system disorders have occurred in workers acutely exposed to inorganic arsenic. Chronic (long-term) inhalation exposure to inorganic arsenic in humans is associated with irritation of the skin and mucous membranes. Chronic oral exposure has resulted in gastrointestinal effects, anemia, peripheral neuropathy, skin lesions, hyperpigmentation, and liver or kidney damage in humans. Inorganic arsenic exposure in humans, by the inhalation route, has been shown to be strongly associated with lung cancer, while ingestion of inorganic arsenic in humans has been linked to a form of skin cancer and also to bladder, liver, and lung cancer.[41]

2.1.16.1.12 Cadmium

Cadmium is a metal found in natural deposits such as ores containing other elements. Some people who drink water containing cadmium well in excess of the maximum contaminant level (MCL) for many years could experience kidney damage.

2.2 REGULATORY FRAMEWORK

This regulatory framework identifies the federal and state laws that govern the regulation of air quality and must be considered by the project proponent regarding decisions on projects that involve construction, operation, or maintenance activities that would result in air emissions.

Responsibility for attaining and maintaining ambient air quality standards in California is divided between CARB and regional air pollution control or air quality management districts. Areas of control for the regional districts are set by CARB, which divides the state into air basins. These air basins are based largely on topography that limits air flow access or by county boundaries. The project property is located in Inyo County, California, within the District.

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[41] U.S. Environmental Protection Agency. Revised December 2012. Technology Transfer Network Air Toxics Web Site: "Arsenic Compounds." Washington, DC. Available at: http://www.epa.gov/ttn/atw/hlthef/arsenic.html

In October 2007, the CARB published a list of 44 early action measures to reduce GHG emissions in California.[42] In August 2010, the CAPCOA published a list of GHG emissions reduction mitigation measures that are grouped into nine categories, including energy, transportation, water, area landscaping, solid waste, vegetation, construction, miscellaneous, and general plans.[43] This regulatory framework identifies state guidance on GHG emissions reduction measures that warrants consideration by the District.

2.2.1 Federal

2.2.1.1 National Environmental Policy Act

The NEPA and its supporting federal regulations establish certain requirements that must be adhered to for any project "financed, assisted, conducted or approved by a federal agency." In making a decision on the issuance of federal grant monies or a permit to conduct work on federal lands for components of the proposed action, the federally designated lead agency pursuant to NEPA is required to "determine whether the proposed action may significantly affect the quality of the human environment." The proposed action site is partially located on land owned by the BLM, so the proposed action would require compliance with NEPA.

2.2.1.2 Federal Clean Air Act

The federal CAA authorizes the U.S. EPA to establish the NAAQS to protect public health and welfare and to regulate emissions of hazardous air pollutants. Existing national standards and state standards were considered in the evaluation of air quality impacts (Table 2.2.1.2-1, *2013 Ambient Air Quality Standards*). The CAA requires the U.S. EPA to routinely review and update the NAAQS in accordance with the latest available scientific evidence. For example, the 1-hour standard for O_3 was revoked in 2005 in favor of a new 8-hour standard that is intended to better protect public health.

[42] California Air Resources Board. October 2007. *Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California Recommended for Board Consideration*. Sacramento, CA. Available at: http://www.arb.ca.gov/cc/ccea/meetings/ea_final_report.pdf

[43] California Air Pollution Control Officers Association. August 2010. *Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emissions Reduction from Greenhouse Gas Mitigation Measures*. Sacramento, CA.

TABLE 2.2.1.2-1
2013 AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards[a]	National Standards[b]	
		Concentration	Primary[c]	Secondary[d]
Ozone (O_3)	1 hour	0.09 ppm (180 μg/m^3)	—	Same as primary standard
	8 hour	0.070 ppm (137 μg/m^3)	0.075 ppm (147 μg/m^3)	
Respirable particulate matter (PM_{10})	24 hour	50 μg/m^3	150 μg/m^3	Same as primary standard
	Annual arithmetic mean	20 μg/m^3	—	
Fine particulate matter ($PM_{2.5}$)	24 hour		35 μg/m^3	Same as primary standard
	Annual arithmetic mean	12 μg/m^3	12 μg/m^3	
Carbon monoxide (CO)	1 hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	—
	8 hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	—
	8 hour (Lake Tahoe)	6 ppm (7 mg/m^3)	—	—
Nitrogen dioxide (NO_2)	1 hour	0.18 ppm (339 μg/m^3)	100 ppb (188 μg/m^3)	—
	Annual arithmetic mean	0.030 ppm (57 μg/m^3)	0.053 ppm (100 μg/m^3)	Same as primary standard
Sulfur dioxide (SO_2) [e]	1 hour	0.25 ppm (655 μg/m^3)	75 ppb (196 μg/m^3)	—
	3 hour	—	—	0.5 ppm (1,300 μg/m^3)
	24 hour	0.04 ppm (105 μg/m^3)	0.14 ppm (for certain areas)	—
	Annual arithmetic mean	—	0.030 ppm (for certain areas)	—
Lead [f]	30-day average	1.5 μg/m^3	—	—
	Calendar quarter	—	1.5 μg/m^3 (for certain areas)	Same as primary standard
	Rolling 3-month average	—	0.15 μg/m^3	
Visibility reducing particles	8 hour	See footnote g	No national standard	
Sulfates	24 hour	25 μg/m^3		
Hydrogen sulfide	1 hour	0.03 ppm (42 μg/m^3)		
Vinyl chloride [f]	24 hour	0.01 ppm (26 μg/m^3)		

NOTES:

a: California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM_{10}, $PM_{2.5}$, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

b: National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 μg/m^3 is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current national policies.

TABLE 2.2.1.2-1
AMBIENT AIR QUALITY STANDARDS, *Continued*

c: National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
d: National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
e: The 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard, the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.
f: The CARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
g: In 1989, the CARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.
SOURCES:
California Air Resources Board. Updated 7 June 2012. Ambient Air Quality Standards. Available at: http://www.arb.ca.gov/research/aaqs/aaqs2.pdf
U.S. Environmental Protection Agency. Updated 14 July 2009. *National Ambient Air Quality Standards (NAAQS)*. Available at: http://www.epa.gov/air/criteria.html
California Air Resources Board. Reviewed 24 November 2009. *California Ambient Air Quality Standards (CAAQS)*. Available at: http://www.arb.ca.gov/research/aaqs/caaqs/caaqs.htm

2.2.1.2.1 National Ambient Air Quality Standards

There are seven federally regulated pollutants (ozone [O_3], nitrogen dioxide [NO_2], sulfur dioxide [SO_2], carbon monoxide [CO], lead [Pb], respirable particulate matter [PM_{10}], and fine particulate matter [PM_{10}]). The O_3 standard was historically measured over 1 hour. In 2004, a new 8-hour O_3 standard superseded the 1-hour standard. Also in 2004, a new $PM_{2.5}$ standard for very fine particulates (those particulates measuring 2.5 micrometers or less in diameter) was added to the existing PM_{10} (particulates measuring 10 micrometers or less) standard. Pursuant to the California Code of Regulations, Title 17, Section 60201, the area is designated nonattainment for ozone.[44]

On August 7, 1987, the U.S. EPA designated the southern Owens Valley (known as the Owens Valley Planning Area [OVPA], see Figure 1.2-3) as one of the areas in the nation that violated the new PM_{10} NAAQS. Subsequent air quality monitoring by the District has shown that the bed of Owens Lake, most of which is owned by the State of California and managed by the California State Lands Commission (CSLC), is the major source of PM_{10} emissions contributing to air quality violations in the OVPA. The Owens Lake bed is considered an anthropogenic (human-caused) source of PM_{10} because the City of Los Angeles's Aqueduct diverts water sources that historically supplied the lake. The 1990 CAA sets CO and PM_{10} attainment deadlines in "serious" nonattainment areas at year 2000 and 2005, respectively. In January 1993, the southern Owens Valley was reclassified as "serious nonattainment" for PM_{10}.

The U.S. EPA required the State of California to prepare a State Implementation Plan (SIP) for the OVPA that demonstrated how PM_{10} emissions would be decreased to prevent exceedances of the NAAQS. The District is the agency delegated by the State of California to fulfill this requirement. In accordance with Section 189(b) of the CAA, an Attainment SIP that demonstrates conformance

[44] California Air Resources Board. Accessed 15 November 2012. *California Code of Regulations*, Title 17, Sections 60201, 60202, 60205, and 60210: "Final Regulation Order, Area Designations for State Ambient Air Quality Standards." Sacramento, CA.

with the federal air quality standards through the implementation of a program of control measures was required to be submitted to the U.S. EPA by February 8, 1997. In November 1998, the District adopted the SIP, which was approved by the U.S. EPA on August 17, 1999. In November 2003, the District adopted a revised SIP requiring supplemental dust control measures (DCMs) in the OVPA.

2.2.1.3 General Conformity Rule

The U.S. EPA has authority over SIP general conformity in areas that do not meet federal air quality standards, and the federal land managers have review authority over any new projects that may affect federal Class I areas, as defined in 40 CFR, Part 51.166; 40 CFR, Part 51, Subpart W; and 40 CFR, Part 93, Subpart B: General Conformity. These regulations ensure that federal actions conform to state and local plans for attainment. The District adopted these general conformity requirements in District Regulation XIII and is delegated to enforce the federal regulations for projects that take place in the District. As the federal lead agency, the BLM must determine if the proposed action requires a conformity determination, and it is determined that this proposed project / proposed action is exempt from the conformity requirements under District Rule 1303.c.4 because the implementation of DCMs in the Keeler Dunes is required by the 2008 Owens Valley SIP (Section 7.5).

2.2.1.4 Bureau of Land Management Bishop Resource Management Plan

This proposed project / proposed action is subject to the BLM's Bishop Resource Management Plan (RMP). The Keeler Dunes are located within the Owens Lake Management Area and South Inyo Management Area, two of nine management areas identified in the RMP. The proposed DCMs would be implemented within the Owens Lake Management Area only.

The RMP includes decisions that are presented in two parts: (1) the area-wide decisions that present management prescriptions valid throughout the entire Bishop Resource Area and (2) the decisions for individual management areas. The RMP specifies one goal regarding air quality for the Owens Lake Management Area:

- Incorporate dust abatement measures in all discretionary actions.

The RMP includes three standard operating procedures that are relevant to air quality:

- Avoid the use of soil-disturbing equipment or vehicles on wet, poorly drained or erosive soils.
- Require soil layer separation and topsoil stockpiling for any activity that involves mechanical soil disturbance. Soil layers will be re-deposited and re-contoured to their natural configuration following project completion.
- Secure any necessary permits or clearances from state and local agencies relative to air quality requirements for projects that may impact air quality.

2.2.1.5 Bureau of Land Management Guidance on Greenhouse Gases

On September 14, 2009, Secretary of the Interior Ken Salazar issued Order No. 3289, addressing the impacts of climate change on domestic water, land, and other natural and cultural resources.

The Order establishes an approach for increasing understanding of climate change and responding to potential climate change related impacts as relevant to the resources that the Department of the Interior (DOI) manages. The document specifically identifies potential impact areas, including potential changes in flood risk and water supply, sea level rise, changes in wildlife and habitat populations and their migration patterns, new invasions of exotic species, and increased threat of wildland fire. The Order includes Climate Change Response Planning Requirements, which require each bureau and office within the DOI (including BLM) to consider and analyze potential climate change impacts when undertaking long-range planning exercises, setting priorities for scientific research and investigations, developing multiyear management plans, and making major decisions regarding potential use of resources under DOI's purview.

2.2.1.6 Draft National Environmental Policy Act Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions

On February 18, 2010, the White House Council on Environmental Quality (CEQ) released, for public review and comment, a draft Guidance Memorandum for Heads of Federal Departments and Agencies (Guidance) on the consideration of GHG emissions and climate change impacts as part of compliance with the NEPA.[45] All federal agency actions requiring NEPA review, except federal land and resource management activities, are covered by this Guidance. The draft Guidance provides formal guidance from CEQ to the federal agencies on the treatment of GHG emissions within NEPA: (1) the treatment of GHG emissions that may directly or indirectly result from a proposed federal action and (2) the analysis of potential climate change impacts on a proposed federal action. In addition, the draft Guidance proposes several key elements for the examination of GHG emissions and climate change impacts:

- A "reference point" of 25,000 metric tons of direct CO_{2e} GHG emissions is proposed as an "indicator" to determine if a proposed federal action's anticipated GHG emissions warrant detailed consideration in a NEPA review. However, for indirect GHG emissions, there is no proposed reference point.

2.2.2 State

2.2.2.1 California Clean Air Act

The California CAA of 1988 requires all air pollution control districts in the state to aim to achieve and maintain state ambient air quality standards for O_3, CO, and NO_2 by the earliest practicable date and to develop plans and regulations specifying how the districts will meet this goal. There are no planning requirements for the state PM_{10} standard. The CARB, which became part of the California EPA in 1991, is responsible for meeting state requirements of the federal CAA, administrating the CAA, and establishing the California Ambient Air Quality Standards (CAAQS). The CAA, amended in 1992, requires all air districts in the state to endeavor to achieve and maintain the CAAQS. The CAAQS are generally stricter than national standards for the same pollutants, but there is no penalty for nonattainment. California has also established state standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles, for which there are no national standards (see Table 2.3.4-1).

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[45] The White House Council on Environmental Quality. 18 February 2010. *Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions*. Washington, DC. Available at: http://www.whitehouse.gov/sites/default/files/microsites/ceq/20100218-nepa-consideration-effects-ghg-draft-guidance.pdf

2.2.2.2 Executive Order S-3-05

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05. Recognizing that California is particularly vulnerable to the impacts of climate change, Executive Order S-3-05 establishes statewide climate change emission reduction targets to reduce CO_{2e} to the year 2000 level (473 million metric tons) by 2010, to the 1990 level (427 million metric tons of CO_{2e}) by 2020, and to 80 percent below the 1990 level (85 million metric tons of CO_{2e}) by 2050 (Table 2.2.2.2-1, *California Business-as-Usual GHG Emissions and Targets*).[46,47] The executive order directs the California EPA Secretary to coordinate and oversee efforts from multiple agencies (i.e., Secretary of the Business, Transportation, and Housing Agency; Secretary of the Department of Food and Agriculture; Secretary of the Resources Agency; Chairperson of the Air Resources Board; Chairperson of the Energy Commission; and President of the Public Utilities Commission) to reduce GHG emissions to achieve the target levels. In addition, the California EPA Secretary is responsible for submitting biannual reports to the governor and state legislature that outline: (1) progress made toward reaching the emission targets, (2) impacts of global warming on California's resources, and (3) measures and adaptation plans to mitigate these impacts. To further ensure accomplishment of the targets, the California EPA Secretary created a Climate Action Team composed of representatives from the aforementioned agencies to implement global warming emission reduction programs and report on the progress made toward meeting the statewide GHG targets established in this executive order. In December 2005, the first report was released, which stated, "the climate change emission reduction targets [could] be met without adversely affecting the California economy," and "when all [the] strategies are implemented, those underway and those needed to meet the Governor's targets, the economy will benefit."[48]

TABLE 2.2.2.2-1
CALIFORNIA BUSINESS-AS-USUAL GHG EMISSIONS AND TARGETS

	California Greenhouse Gas Business-as-Usual Emissions and Targets (Million Metric Tons of CO_{2e})				
Emission Level	**1990**	**2000**	**2010**	**2020**	**2050**
Business-as-usual emissions *	427	473	532	596	762
Target emissions	—	—	473	427	85

NOTE: * Business-as-usual emissions reflect the projected emissions under a scenario without GHG control measures, where California would continue to emit GHGs at the same per capita rate. The CARB has not yet projected 2050 emissions under a business-as-usual scenario. Therefore, 2050 business-as-usual emissions were calculated assuming a linear increase of emissions from 1990 to 2050.

[46] California Office of the Governor. 1 June 2005. Executive Order S-3-05. Sacramento, CA.

[47] California Climate Action Team. 3 April 2006. *Climate Action Team Report to Governor Schwarzenegger and the Legislature*. Sacramento, CA.

[48] California Climate Action Team. 3 April 2006. *Climate Action Team Report to Governor Schwarzenegger and the Legislature*. Sacramento, CA.

2.2.2.3 *Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California Recommended for Board Consideration*

In October 2007, the CARB published a list of 44 early action measures to reduce GHG emissions in California pursuant to the Global Warming Solutions Act of 2006 (known as AB 32).[49] The early action measures identified by the CARB included previously approved discrete early action items, such as low carbon fuel standard, restriction on high global warming potential refrigerants, and landfill methane capture. Additional early actions such as smartway truck efficiency, tire inflation program, and anti-idling enforcement were recommended. This list reflected state guidance on GHG emission reduction measures that warrants consideration by the District.

2.2.2.4 *California Air Pollution Control Officers Association*

In August 2010, the CAPCOA published guidance on quantifying GHG emissions mitigation measures. The guidance was a resource tool for the local government to assess emission reductions from GHG mitigation measures.[50] The guidance listed various purposes for quantifying GHG emission reduction, including voluntary reductions of GHG emissions, reductions to mitigate current or future GHG emissions at a project level, reductions for regulatory compliance with command and control regulations, permitting programs, cap-and-trade programs, and mandatory reporting rule for specified stationary sources, and reductions to obtaining GHG emission credits. In addition, the guidance listed quantification concepts, approaches, and methodologies. Quantification methodologies for a selection of GHG emission reduction measures such as vegetation (including trees), construction equipment, and transportation were discussed. This guidance demonstrated state-recommended methods on how to quantify GHG emission mitigation measures that warrants consideration by the District.

2.2.3 Regional

2.2.3.1 *Great Basin Unified Air Pollution Control District Plans, Rules, and Regulations*

The District was formed through a joint power agreement in 1974 for Inyo, Mono, and Alpine Counties and covers the Great Basin Valleys Air Basin in California. The District regulates PM_{10} emissions in the OVPA consistent with the requirements of the NAAQS.

The District has the responsibility to enforce federal, state, and local air quality regulations and to ensure that the federal and state air quality standards are met within the district. These standards are set to protect the health of sensitive individuals by restricting how much pollution is allowed in the air. To meet these standards the District aims to enforce those federal laws and state laws on stationary sources of pollution and pass and enforce its own regulations as they become necessary for air quality issues.

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[49] California Air Resources Board. October 2007. *Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California Recommended for Board Consideration*. Sacramento, CA. Available at: http://www.arb.ca.gov/cc/ccea/meetings/ea_final_report.pdf

[50] California Air Pollution Control Officers Association. August 2010. *Quantifying Greenhouse Gas Mitigation Measures*. Sacramento, CA. Available at: http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf

For transportation conformity purpose and as required by District Rule 1231(e),[51] areas such as the OVPA, where construction-related fugitive PM_{10} is a contributor to the nonattainment problem, regional PM_{10} emissions analysis must consider construction-related fugitive PM_{10}, including emissions generated by new highway construction projects in the OVPA. The level of construction activity, fugitive PM_{10} control measures in the SIP, and the dust-producing capacity of the proposed activities in the applicable implementation plan must also be included in the analysis.

General conformity requirements contained in District Regulation XIII[52] implement Section 176 (c) of the federal CAA, as amended (42 U.S.C. 7401 *et seq.*), and regulations under 40 CFR Part 51 Subpart W. This regulation requires that federal actions and federally funded projects conform to SIP rules and do not interfere with efforts to attain federal air quality standards.

All fugitive dust sources are required to meet District Rule 400[53] and Rule 401,[54] which limit visible emissions to less than 20 percent opacity and require reasonable precautions to be taken to prevent visible emissions from leaving the proposed project / proposed action area. Reasonable precautions include, but are not limited to, water suppression, chemical stabilizers, windbreaks, and surface coverings. Fugitive dust sources such as vehicles on unpaved roadways, earthmoving, and gravel mining operations are affected by these District Rules.

There are three measures included in Appendix D, *Mitigation Monitoring Reporting Program*, of the 2008 SIP:

Measure Air-1 Fugitive Dust Emissions Control and Minimization

Fugitive dust emissions shall be controlled and minimized, to comply with Great Basin Unified Air Pollution Control District Rules 400 and 401 (EPA 1992), through the application of best available control measures during construction and operation of the proposed project. This may include, but would not be limited to, the use of chemical soil stabilizers, surface coverings, windbreaks, water trucks, and water sprays, or comparable measures that prevent visible dust from leaving the proposed project area. The primary areas of treatment for dust control will be in the construction staging areas and the primary access roads in the proposed project area. A daily log will be maintained by the site operator during the construction phase of the proposed project to note the time of water or surface treatment applications. During the construction phase, straw bales will be placed near vehicle access areas and along the distribution routes in the proposed project area to serve as windbreaks to control windblown dust along the travel routes. By working outward from the staging areas and access routes in placing the straw bales, construction of the proposed project will serve to control windblown dust in the proposed project area. In addition, all vehicles travelling on unpaved surfaces inside the proposed project area will have a posted speed limit of 15 miles per hour in order to reduce dust from vehicle traffic. The site operator (or contractor) shall demonstrate

[51] Great Basin Unified Air Pollution Control District. Adopted 10 May 1994. *Regulation XII—Conformity to State Implementation Plans of Transportation Plans, Programs, and Projects Developed, Funded or Approved under Title 23 U.S.C. or the Federal Transit Act, District Rule 1231(e)—Procedures for Determining Regional Transportation-Related Emissions*. Bishop, CA. Available at: http://www.arb.ca.gov/drdb/gbu/curhtml/reg-12.htm

[52] Great Basin Unified Air Pollution Control District. Adopted 10 May 1994. *Regulation XIII—Conformity of General Federal Actions to State Implementation Plans*. Bishop, CA. Available at: http://www.arb.ca.gov/drdb/gbu/curhtml/reg-13.htm

[53] Great Basin Unified Air Pollution Control District. Revised 18 January 1979. *Rule 400—Ringelmann Chart*. Bishop, CA. Available at: http://www.District.org/rulesandregulations/PDF/Rule401.pdf

[54] Great Basin Unified Air Pollution Control District. Revised 4 December 2006. *Rule 401—Fugitive Dust*. Bishop, CA. Available at: http://www.District.org/rulesandregulations/PDF/Rule401.pdf

compliance with this measure through the submission of weekly monitoring reports to the Great Basin Unified Air Pollution Control District, which will, in return, monitor the application of best available control measures at least once a week on an ongoing basis during the construction phase of the proposed project, and maintain a monitoring log on file.

Measure Air-2 Low-Sulfur Fuel Utilization

To mitigate the air quality impact related to greenhouse gas emissions, the City of Los Angeles Department of Water and Power shall apply best available control measures during construction by utilizing low-sulfur and/or alternative fuels for on-site stationary equipment. Diesel-fired stationary sources of air emissions, such as pumps, compressors, generators, and motor vehicles shall be fueled with diesel that meets California Air Resources Board standards or with an alternative diesel fuel that meets the requirements of the Standard of Motor Vehicle Fuel found in 13 CCR Section 2281. The fuel shall comply with the standard of 15 parts per million or less of sulfur content by weight.

Measure Air-3 Low-Emission Motor Vehicle and Engine Utilization during Construction

To mitigate the air quality impact related to greenhouse gas emissions and toxic air contaminants, all motor vehicles, including diesel trucks, all-terrain vehicles, diesel generators, and off-road equipment shall be compliant with California Air Resources Board emission standards and regulations. In addition, carpooling of construction workers should be considered and encouraged by the site operator or contractor to reduce vehicular emissions.

2.2.3.2 Inyo County General Plan

The Inyo County General Plan contains policies related to air quality in its Safety element.[55] The goal of the Safety element is to foster compatible land use arrangements that contribute to reduced energy consumption and improved air quality. The Safety element contains a summary of the existing conditions in the planning area, major issues, and policies designed to aid Inyo County in achieving its goal. There are three policies in the Inyo County General Plan that are relevant to the proposed project / proposed action:

- Policy AQ-1.1: Regulations to Reduce PM_{10}. Support the implementation of the State Implementation Plan and the agreement between the District and the LADWP.
- Policy AQ-1.2: Attainment Programs. Participate in the District's attainment programs.
- Policy AQ-1.3: Dust Suppression During Construction. Require dust-suppression measures for grading activities.

[55] Inyo County Planning Department. December 2001. *Inyo County General Plan, Public Safety Element.* Independence, CA.

2.3 EXISTING CONDITIONS

2.3.1 Great Basin Valleys Air Basin

The proposed project / proposed action property is located in the Great Basin Valleys Air Basin (GBVAB), in eastern California, and is composed of a 13,975-square-mile (9-million-acre) area encompassing Inyo County, Mono County, and Alpine County. In 1974, these three counties joined together in a joint powers agreement to form the District, which governs the GBVAB. The analysis of existing conditions related to air quality summarizes pollutant levels that exist prior to implementation of each component of the proposed project / proposed action. All components of the proposed project / proposed action are located within the GBVAB; therefore, all air quality data and analysis are presented as an aggregate of the entire proposed project / proposed action site.

The climate of the proposed project / proposed action site is characterized as a desert climate with hot summers, cold winters, infrequent rainfalls, moderate- to high-wind episodes, and low humidity. Average temperature and precipitation data have been recorded at the Independence Monitoring Station (Station Number 044232, located approximately 30 miles northwest of the proposed project / proposed action site at latitude 36° 48′ north, longitude 118° 11′ west). From 1893 to 2013, the annual average maximum temperature recorded was 75.2 degrees Fahrenheit (ºF), with an average maximum winter (December, January, and February) temperature of approximately 55.6ºF and an average maximum summer (June, July, and August) temperature of approximately 95.1ºF (Appendix A). Average minimum temperatures were recorded as approximately 28.9ºF in winter and 61.6ºF in summer. The average precipitation per year is approximately 5.21 inches, which occurs mostly during the winter, and relatively infrequently during the summer (Appendix A). Precipitation averages approximately 1.00 inch per month during the winter (December, January, and February), approximately 0.28 inch per month during the spring (March, April, and May), approximately 0.33 inch per month during the fall (September, October, and November), and approximately 0.12 inch per month during the summer (June, July, and August; Appendix A). The average wind speed, as recorded at the Independence Monitoring Station from 2004 to 2013, was approximately 4.8 miles per hour (mph; Appendix A).

The GBVAB is relatively rural and sparsely populated with a total of approximately 32,000 people. The GBVAB contains many mountain ranges to the east of Sierra Nevada. The mountain peaks on either side of the Owens Valley reach above 14,000 feet in elevation. Prevailing winds in the GBVAB are out of the north with a strong high-pressure area over the Basin and flow out of the Basin into the Central Valley, the Southeastern Desert Basin, and the South Coast. During the summer months of July and August, the prevailing winds in the GBVAB are out of the south and southeast. The mountain ranges of the GBVAB to the east form a barrier that protects much of California from extremely cold air from the east in winter. The Sierra Nevada to the west blocks the majority of cool, moist coastal air from entering the GBVAB from the west, so the GBVAB experiences infrequent rainfalls and prevalent low humidity.

2.3.2 Climatic Conditions

Severe weather is common in the Owens Valley. The average maximum temperature exceeds 90°F in summer, while average minimum temperatures drop to below 32°F in winter (Appendix A).

2.3.3 Emission Sources

The Keeler Dunes and associated sand deposits are a source of fugitive dust emissions that impact air quality in the communities of Swansea and Keeler. The Keeler Dune field and associated sand sheet is approximately 856 acres in size and is located adjacent to the dried bed of historic Owens Lake between the communities of Swansea and Keeler. Dust concentrations measured within the community of Keeler from the Keeler Dunes continue to exceed the federal and state PM_{10} 24-hour standards of 150 and 50 $\mu g/m^3$, respectively. The number of exceedances of the federal PM_{10} standard in the community of Keeler that are attributed to Owens Lake Bed emissions has decreased with time, from as many as 16 per year in 1994 to just over 1 per year from 2006 to 2012. This air quality improvement in Keeler is due to the implementation of dust control projects on the lake bed. However, the uncontrolled Keeler Dunes continue to cause an average of six PM_{10} standard exceedances every year since 1993.[56] These standard exceedances threaten the health, property, and environment of the residents of the Keeler/Swansea area.

In addition to the high levels of fine particulate matter, Owens Lake dust also contains cadmium, arsenic, and other toxic metals that are at levels above those in soils in the Owens Valley due to natural concentration in the terminal lake.[57] These metals pose a significant risk for additional cancer cases in the areas of greatest dust impact. Table 2.3.3-1, *Inhalation Cancer Risk at Keeler due to Owens Lake Dust Storms*, shows that the cancer risk at Keeler, associated with cadmium and arsenic in the Owens Lake dust, is estimated at 23 additional cases in a million. This is based on an annual concentration average of 45 $\mu g/m^3$ from the dust storms, breathed over a 70-year period. The value of 45 $\mu g/m^3$ is taken from the 7-year average of PM_{10} concentrations measured using a tapered-element oscillating microbalance (TEOM) at Keeler (1993–2000). This average represents the annual average prior to the implementation of controls. Under the District's adopted air toxics policy, a toxic risk greater than 1 in a million additional cancer cases is considered to be significant. This policy requires implementation of controls on sources that pose a risk greater than 1 in a million in order to reduce the risk, and it prohibits the issuance of a permit to sources that exceed a risk of 10 in a million.[58] A revised cancer risk from arsenic and cadmium, using the reduced average dust concentration of 34 $\mu g/m^3$ at Keeler, would result in 17 cases per million, a significant reduction in cancer risk. Model calculations project an average Keeler PM_{10} concentration of 21 $\mu g/m^3$ after all DCMs are operational. This would result in even greater reduction in cancer risk. Since this residual dust would contain a smaller fraction of lake bed–derived material than under pre-dust-control conditions, the benefits for reduction in cancer risk would be compounded.

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[56] Great Basin Unified Air Pollution Control District. 7 September 2012. *Preliminary Staff Report: Origin and Development of the Keeler Dunes*. Bishop, CA.

[57] Great Basin Unified Air Pollution Control District. 28 January 2008. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan*. Bishop, CA.

[58] Great Basin Unified Air Pollution Control District. 9 December 1987. *Toxic Risk Assessment Policy*. Bishop, CA.

TABLE 2.3.3-1
INHALATION CANCER RISK AT KEELER DUE TO OWENS LAKE DUST STORMS

Toxic Metal	Cancer Potency* $(\mu g/m^3)^{-1}$	Toxic Metal Concentration** (parts per million)	Inhalation Cancer Risk***
Cadmium	4.2×10^{-3}	29	5 per million
Arsenic	3.3×10^{-3}	118	18 per million
Lifetime Cancer Risk = 23 per million			

NOTES:
* Cancer potency data are from the Air Toxics Hot Spots Program (Office of Environmental Health Hazard Assessment, August 2003).
** Dust samples are taken from Keeler PM_{10} filters, with concentrations measured by x-ray fluorescence (Chester LabNet, 1996).
*** 70-year cancer risk with PM_{10} = 45 $\mu g/m^3$ (Keeler annual average from 1993–2000).
SOURCE: Great Basin Unified Air Pollution Control District. 28 January 2008. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan*. Bishop, CA.

2.3.4 Air Monitoring Stations

Ambient air quality data for the proposed project / proposed action vicinity was recorded at the Keeler monitoring site for PM_{10} and $PM_{2.5}$. For ozone, the nearest representative monitor site is located at Furnace Creek, California, about 50 miles east of the proposed project / proposed action site. Table 2.3.4-1, *Comparison of 2009–2011 Ambient Air Quality Data in the Vicinity of the Proposed project / proposed action*, shows the monitor readings at these sites as they compare to the National Ambient Air Quality Standards. There is no representative data available for CO, NO_2, or SO_2. For the three-year monitoring period from 2009 through 2011, the project area was in compliance with the federal 8-hour ozone standard and the annual $PM_{2.5}$ standard, and in violation of the federal 24-hour $PM_{2.5}$ and PM_{10} standards. Violations of the particulate matter standards in Keeler are primarily due to windblown dust from the Keeler Dunes.

TABLE 2.3.4-1
COMPARISON OF 2009–2011 AMBIENT AIR QUALITY DATA IN THE VICINITY OF THE PROPOSED PROJECT / PROPOSED ACTION

Pollutant	National Ambient Air Quality Standard (NAAQS)	Pollutant Concentrations		
		2009	2010	2011
Ozone (O_3) Furnace Creek, CA	4th highest 8-hr concentration (ppm)	0.070 ppm	0.069 ppm	0.075 ppm
	NAAQS: 3-year average < 0.075 ppm Monitor: 3-year average = 0.071 ppm	Compliant	Compliant	Compliant
Suspended particulate matter (PM_{10}) Keeler, CA	Maximum 24-hr concentration ($\mu g/m^3$)	463 μg/m3	270 μg/m3	999 μg/m3
	NAAQS: 4th highest in 3 years < 150 $\mu g/m^3$ Monitor: 4th highest in 3 years =430 $\mu g/m^3$	Violation	Violation	Violation
Fine particulate matter ($PM_{2.5}$)	98th-percentile 24-hour concentration ($\mu g/m^3$)	36.0 $\mu g/m^3$	28.2 $\mu g/m^3$	44.1 $\mu g/m^3$
	NAAQS: 3-year average < 35 $\mu g/m^3$ Monitor: 3-year average = 36.1 $\mu g/m^3$	Violation	Compliant	Violation
	Annual average concentration ($\mu g/m^3$)	6.8 $\mu g/m^3$	7.1 $\mu g/m^3$	8.2 $\mu g/m^3$
	3-year average < 15.0 $\mu g/m^3$ [3-year average = 7.4 $\mu g/m^3$]	Compliant	Compliant	Compliant

KEY: *ppm = parts per million. ** $\mu g/m^3$ = micrograms per cubic meter.
SOURCE: California Air Resources Board. Accessed 6 November 2013. "Top 4 Summary" Website. Available at: http://www.arb.ca.gov/adam/topfour/topfour1.php

The District operates 15 air quality monitoring stations within the District (Figure 2.3.4-1, *Great Basin Unified Air Pollution Control District Air Quality Monitoring Sites*). These stations are located in four planning areas (Coso Junction, OVPA, Mono Basin, and Mammoth Lakes) and in two of the District's three counties (Inyo and Mono)).[59] Each of the 15 stations monitors PM_{10} concentrations, but only the Keeler station monitors $PM_{2.5}$ concentrations. Because the District is primarily rural, only the monitoring station at Mammoth Lakes reflects a more urban influence. Yearly concentrations of PM_{10} from 2009 through 2012 were recorded across the District (Table 2.3.4-2, *Summary of 2009–2012 PM_{10} Concentrations at the District's 15 Air Quality Monitoring Sites*). During this 4-year period, particulate levels exceeded the 24-hour federal PM_{10} standard 307 times.[60] During windy conditions, dust from the beds of Mono Lake and Owens Lake produce extremely high PM_{10} concentrations, which reached 14,147$\mu g/m^3$ in over 24 hours in 2009. The highest recent concentrations have occurred at the Keeler and Mono North Shore (north of the OVPA) monitoring sites. Annual average $PM_{2.5}$ concentrations at the Keeler monitoring site are low (maximum of 8.58 $\mu g/m^3$). Lizard Tail (2 kilometers north) and Keeler (1 kilometer south) are the closest PM monitor sites to the proposed project / proposed action site. In addition to the air monitoring stations, the District also operates 16 sand motion monitoring sites within the proposed project / proposed action study area.

[59] Kiddoo, Phill, Great Basin Unified Air Pollution Control District, Bishop, CA. 10 October 2012. Email to Makeba Pease, Sapphos Environmental, Inc., Pasadena, CA.

[60] Kiddoo, Phill, Great Basin Unified Air Pollution Control District, Bishop, CA. 8 November 2013. Email to Adam Furman, Sapphos Environmental, Inc., Pasadena CA.

TABLE 2.3.4-2
SUMMARY OF 2009–2012 PM_{10} CONCENTRATIONS AT THE DISTRICT'S 15 AIR QUALITY MONITORING SITES

Monitoring Site	PM_{10} ($\mu g/m^3$) Maximum 24-hr	PM_{10} NAAQS Exceedances
Coso Junction	219	5
Dirty Sox	1,437	33
Flat Rock	871	12
Keeler	13,380	31
Lee Vining	115	0
Lizard Tail	4,571	42
Lone Pine	264	3
Mammoth Lakes	128	0
Mill Site	754	7
Mono North Shore	14,147	81
North Beach	2,067	37
Olancha	779	16
Shell Cut	2149	23
Stanley	1507	12
White Mountain Research Station	626	5

SOURCE: Kiddoo, Phill, Great Basin Unified Air Pollution Control District, Bishop, CA. 8 November 2013. Email to Adam Furman, Sapphos Environmental, Inc., Pasadena CA.

2.3.5 Greenhouse Gas Emissions

In order to establish a reference point for future GHG emissions, CO_{2e} emissions have been projected based on an unregulated, business-as-usual, GHG emissions scenario that does not consider the reductions in GHG emissions required by Executive Order S-3-05 or AB 32. CARB has stated that California contributed 427 million metric tons of GHG emissions in CO_{2e} in 1990 and, under a business-as-usual development scenario, will contribute approximately 596 million metric tons of CO_{2e} emissions in 2020, which presents a linear upward trend in California's total GHG emissions. To characterize the business-as-usual GHG emissions specifically for Inyo County, information on population has been collected from the California Department of Finance. It has been projected that the population of Inyo County will increase by approximately 24 percent from 2010 to 2050.[61] Using the current CO_{2e} emissions factor of 14 metric tons per capita,[62] Inyo County would be responsible for the emission of approximately 0.26 million metric ton of CO_{2e} in 2010 and 0.32 million metric tons of CO_{2e} in 2050 under a business-as-usual emissions scenario (Table 2.3.5-1, *Characterization of Business-as-Usual GHG Emissions for Inyo County*).

[61] California Department of Finance. January 2013. *State and County Population Projections by County, by Race/Ethnicity, and by Major Age Groups, 2010-2060 (by decade)*. Available at: http://www.dof.ca.gov/research/demographic/reports/projections/view.php

[62] California Air Resources Board. 15 October 2008. *Climate Change Proposed Scoping Plan: A Framework for Change*. Sacramento, CA. Available at: http://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm

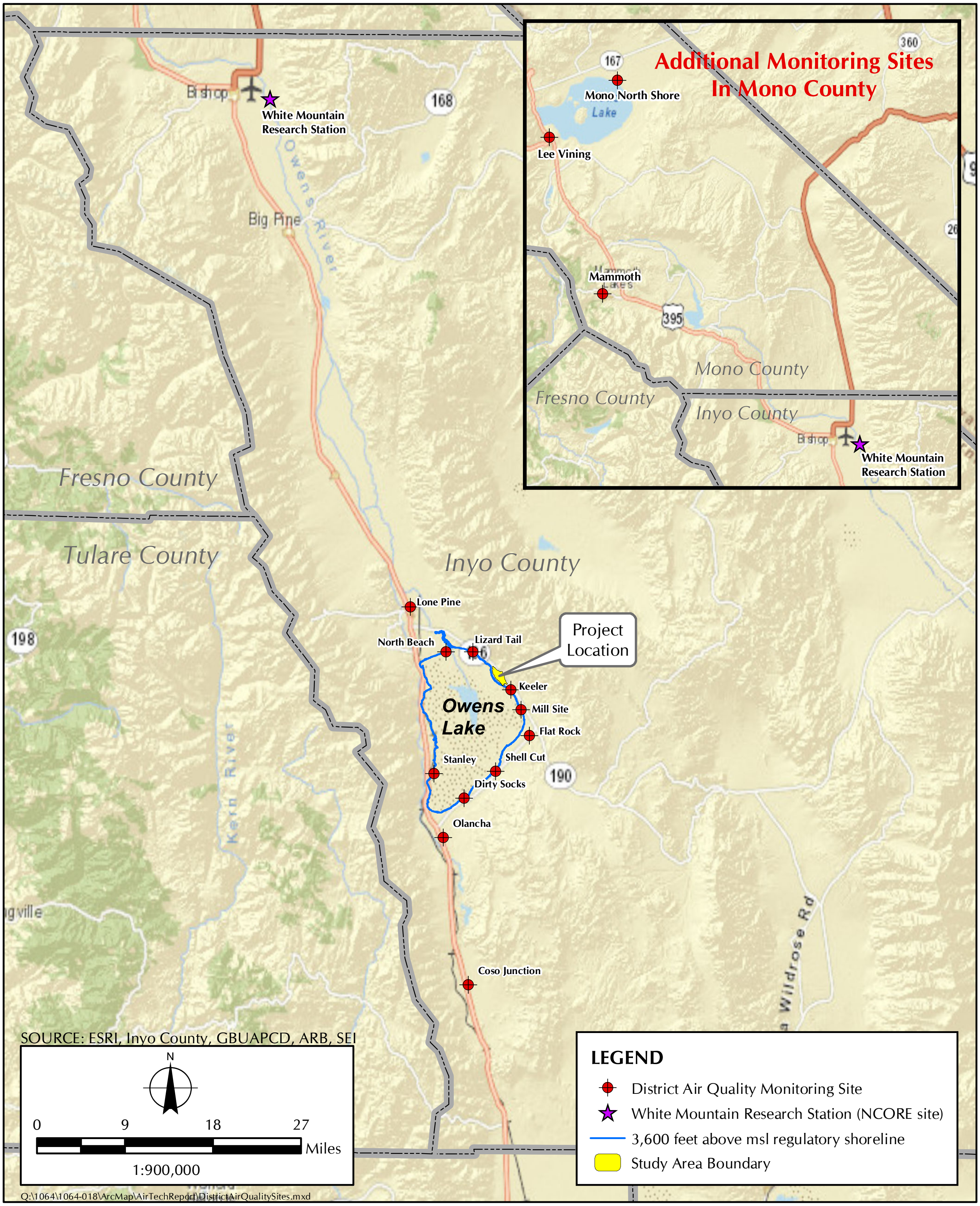

FIGURE 2.3.4-1

Great Basin Unified Air Pollution Control District
Air Quality Monitoring Sites

TABLE 2.3.5-1
CHARACTERIZATION OF BUSINESS-AS-USUAL GHG EMISSIONS FOR INYO COUNTY

	Year						
	1990	**2000**	**2010**	**2020**	**2030**	**2040**	**2050**
Population	18,281	17,945	18,528	19,350	20,428	22,009	23,053
CARB emission factor (metric tons of CO_{2e} per capita)	14	14	14	14	14	14	14
Annual GHG emissions for Inyo County (million metric tons of CO_{2e})	0.26	0.25	0.26	0.27	0.29	0.31	0.32

SOURCES:
California Department of Finance. January 2013. *State and County Population Projections by County, by Race/Ethnicity, and by Major Age Groups, 2010-2060 (by decade)*. Available at:
http://www.dof.ca.gov/research/demographic/reports/projections/view.php
California Department of Finance. August 2011. *Historic Census Populations of Counties and Incorporated Cities in California 1850–2010*. Available at:
http://www.dof.ca.gov/research/demographic/state_census_data_center/historical_census_1850-2010/view.php

2.3.6 Sensitive Receptors

Locations that can be considered sensitive receptors for air quality impacts include residences, schools, playgrounds, childcare centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes.[63] Sensitive individuals with compromised immune systems, such as children and the elderly, have the potential to be exposed to emissions from the construction-related activities associated with the proposed project / proposed action, but the emissions during wind events are far greater in magnitude than any potential emissions from construction activities. The greatest potential for exposure of sensitive receptors to air contaminants would occur under strong wind events during site preparation and planting phases, when soil would be disturbed and equipment would be used for grading, materials delivery, and planting.

The purpose of the proposed project / proposed action, in combination with other ongoing dust control projects that have been and are being implemented on the Owens Lake bed, is to improve air quality through the reduction of PM_{10} emissions throughout the OVPA, consistent with the 2008 State Implementation Demonstration of Attainment Plan.[64] In particular, the purpose of this proposed project / proposed action is to reduce the exposure of residents of the communities of Swansea and Keeler to unhealthful levels of PM_{10} emissions. Although DCMs are necessary at the Keeler Dunes to bring the community of Keeler into compliance with the NAAQS for PM_{10} by 2017, it is anticipated that due to delays in getting funding for the project and in completing this EIR/EA, the proposed project / proposed action would be installed by spring 2015 and be able to demonstrate attainment by 2018.

[63] California Air Resources Board. 29 March 2005. *Air Quality and Land Use Handbook: A Community Health Perspective*. Sacramento, CA.

[64] Great Basin Unified Air Pollution Control District. 28 January 2008. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan*. Bishop, CA.

Potential exposure to construction emissions would vary substantially from day to day, depending on the amount of work being conducted, weather conditions, location of receptors, and exposure time. The planting-phase emissions in this analysis are estimated conservatively based on worst-case conditions, with maximum levels of construction activity occurring simultaneously within a short period of time. The nearest sensitive receptors include the community of Swansea located north and adjacent to the proposed project / proposed action and the community of Keeler southeast and adjacent to the proposed project / proposed action. One designated Native American reservation (Lone Pine Paiute-Shoshone Indian Reservation) and the town of Lone Pine are approximately 10 miles to the northwest (Figure 2.3.6-1, *Sensitive Receptors*).

2.4 ASSESSMENT METHODS AND MODELS

As discussed in Section 1.0, *Introduction*, the proposed project / proposed action would entail planting approximately 370,000 native vegetation plants and placing approximately 124,000 straw bales as a temporary DCM as part of the mitigation plan to reduce particulate matter emissions from the site.

2.4.1 CalEEMod Model

The California Emissions Estimator Model (CalEEMod 2013.2.2) was used to estimate construction emissions from the preparation of the temporary access routes, delivery and placement of straw bales, delivery and placement of native plants, and periodic watering of plants. CalEEMod is a computer program that can be used to estimate emissions associated with land development projects in California such as residential neighborhoods, shopping centers, and office buildings; area sources such as gas appliances, wood stoves, fireplaces, and landscape maintenance equipment; and construction projects. The CalEEMod, version 2013.2.2, emissions model directly calculates criteria pollutant emissions, as well as GHG (CH_4 and N_2O and CO_2) emissions. The proposed project / proposed action property lacks an industrial component that would be considered a Pb emission source, so the concentrations and emissions of Pb were not analyzed. The analysis of construction impacts to air quality is based on the construction scenario summarized in Section 1.3.2, *Construction Scenario*, of this report.

The air quality impacts from the proposed project / proposed action can be separated into construction-related short-term impacts and operation-related long-term, permanent impacts. Both types of impacts may occur on a local or regional scale.

2.4.2 Short-Term Greenhouse Gas Emissions Inputs

The proposed project / proposed action would include the placement of approximately 124,000 straw bales and 370,000 native plants on the approximately 194-acre property. The following factors were assumed in the technical analyses of air quality using the CalEEMod, version 2013.2.2, emission model:

1. Total construction would take a maximum of 11 months, starting in August 2014 and extending to March 2015.

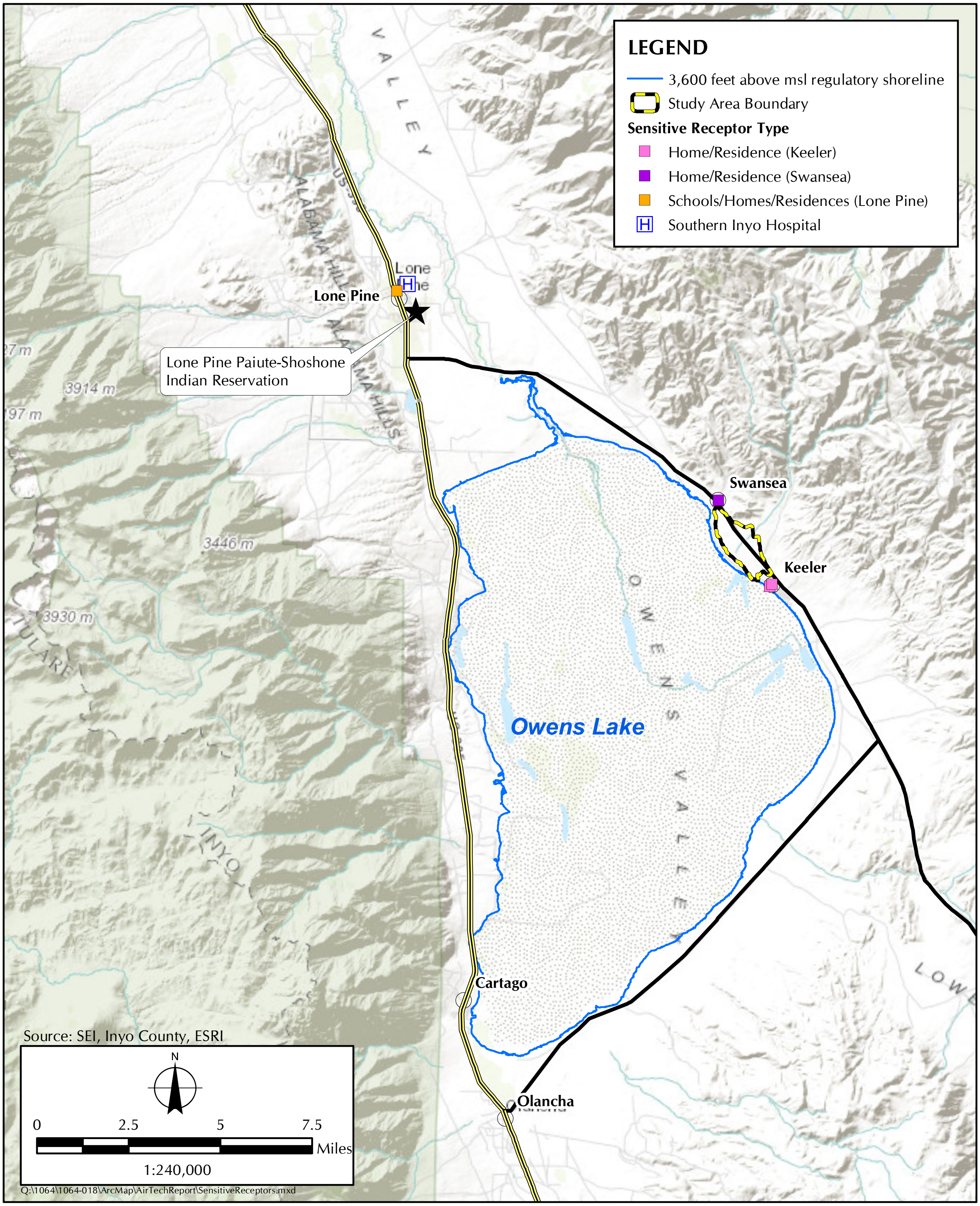

FIGURE 2.3.6-1

Sensitive Receptors

2. The construction activities undertaken would be as follows:

Month 1:	Site preparation
Months 2-5:	Distribute straw bales on sand dunes
Months 3-7:	Planting and watering
Month 8:	Clean up and restoration

3. A maximum of 33.1 acres would be disturbed temporarily during the site preparation phase.

4. Following construction, supplemental monitoring and watering would occur from 2015–2017. This would include watering, in March/April and September/October of each year.

5. The climate zone was set to 9, and the wind speed was set to 3.8 meters per second.

6. 95 percent of worker trips were assumed to occur on unpaved roads.

7. Default parameters, such as the horsepower and the load factor, were used for all construction equipment anticipated to be used for the proposed project / proposed action.

2.4.3 Long-Term Greenhouse Gas Emissions and Potential Savings

Annual GHG emissions and the potential reduction in PM_{10} associated with operation of the proposed project / proposed action were quantified using CalEEMod, version 2013.2.2. Assuming that planting is 50 percent successful, the proposed project / proposed action would generate a net CO_2 benefit and reduce PM_{10} emissions by as much as 95 percent. The potential GHG emissions from construction and maintenance of the proposed project / proposed action were calculated by using the CalEEMod model.

2.5 SIGNIFICANCE CRITERIA

2.5.1 Significance Thresholds

The majority of the proposed DCMs are located on BLM-administrated land, and the BLM is required to demonstrate that it would undertake, approve, permit, or support an action that would conform to the SIP. The proposed project / proposed action site is located in an area that is designated as nonattainment for the 24-hour NAAQS for PM_{10} pursuant to the provisions of the federal CAA.

Neither the District nor Inyo County has established CEQA thresholds for criteria pollutants. However, the U.S. EPA *de minimis* threshold of 70 tons of PM_{10} per year applies to all federally regulated air pollutants in the GBVAB.

The CAPCOA has discussed several approaches to consider the potential cumulative significance of projects with respect to GHGs.[65] A zero-threshold approach can be considered based on the concept that climate change is a global phenomenon and all GHG emissions generated throughout the Earth contribute to climate change. However, State CEQA Guidelines also recognize that there may be a point at which a project's contribution, although above zero, to the cumulative impact would not be considerable (State CEQA Guidelines, Section 15130 [a]). Therefore, a threshold of greater than zero is considered more appropriate for the analysis of GHG emissions under CEQA. The CAPCOA's summary of suggested thresholds for GHG emissions includes efficiency-based thresholds, quantitative emission limits, and limits on the size of projects (Table 2.5.1-1, *CAPCOA-Suggested Thresholds for Greenhouse Gases*).

For the purposes of the analysis presented in this document, the suggested reporting threshold of 25,000 metric tons CO_{2e} per year will be used as a quantitative threshold to assist with determining significance. The reporting threshold was selected because it corresponds to the threshold set by the U.S. EPA for the Mandatory Reporting of GHG Rule.

TABLE 2.5.1-1
CAPCOA-SUGGESTED THRESHOLDS FOR GREENHOUSE GASES

Description	Suggested Threshold
Quantitative (900 tons)	Approximately 900 metric tons CO_{2e}/year for residential, office, and non-office commercial projects
Quantitative CARB reporting threshold / cap and trade	Report: 25,000 metric tons CO_{2e}/year Cap and trade: 10,000 metric tons CO_{2e}/year
Quantitative regulated inventory capture	Approximately 40,000 to 50,000 metric tons CO_{2e}/year
Unit-based threshold based on market capture	Commercial space > 50,000 square feet
Projects of statewide, regional, or area-wide significance	Residential development > 500 units Shopping center/business establishment > 500,000 square feet Commercial office space > 250,000 square feet Industrial park > 600,000 square feet

SOURCE: California Air Pollution Control Officers Association. January 2008. *CEQA and Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act*. Sacramento, CA.

[65] California Air Pollution Control Officers Association. January 2008. *CEQA and Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act*. Sacramento, CA.

2.6 IMPACT ANALYSIS

This section analyzes the potential for the proposed project / proposed action to have significant impacts to air quality and GHG emissions. Air quality impacts of a proposed project / proposed action generally fall into four major categories:

1. Construction impacts are temporary impacts, including airborne dust from grading, demolition, and dirt hauling and emissions of GHGs and criteria pollutants from heavy equipment, delivery and dirt-hauling trucks, employee vehicles, and paints and coatings. Construction emissions vary substantially from day to day, depending on the construction activities and weather conditions.

2. Operational regional impacts are primarily emissions of GHGs and criteria pollutants from natural gas and electricity usage and vehicles traveling to and from a proposed project / proposed action site.

3. Operational local impacts are increases in pollutant concentrations, primarily CO, which result from traffic increases in the immediate vicinity of a proposed project / proposed action, as well as any toxic and odor emissions generated on-site.

4. Cumulative impacts are air quality and GHG changes that result from the incremental impact of the proposed project / proposed action when added to other projects in the vicinity.

2.6.1 Construction Phase

Construction of the proposed project / proposed action has the potential to create air quality and GHG emissions impacts through the use of construction equipment and through vehicle trips generated from construction workers traveling to and from the proposed project / proposed action property. Fugitive dust emissions would primarily result from site preparation activities, whereas NO_x and GHG emissions would primarily result from delivery and hauling of construction materials and equipment, the use of construction equipment, and the construction workers' commute trips to and from the proposed project / proposed action property. The assessment of construction air quality impacts considers each of these potential sources during each part of the construction phase. Although construction emissions can vary substantially from day to day, depending on the level of activity and the specific type of operation, and the fact that fugitive dust emissions can vary based on the prevailing weather conditions, the analysis considers a worst-case scenario with concurrent use of construction equipment to ensure that impacts are not underestimated.

2.6.1.1 Construction Scenario

The information contained in the construction scenario for the proposed project / proposed action, as described in Section 1.0 of this report, was developed from empirical data for construction of comparable projects and was used in the assessment of potential construction impacts to air quality. A summary of the construction scenario is presented here.

Installation of the proposed project / proposed action would require a maximum of 11 months. Construction of the proposed project / proposed action would be divided into the following parts: (1) temporary access routes and staging area(s), (2) bale placement and planting and watering, (3) project oversight and monitoring and supplemental watering (up to one per year for 3 years) and planting as required, and (4) staging area and access route restoration.

Site preparation of the staging area and access routes would require brushing and grubbing of existing vegetation. Construction of the proposed project / proposed action will require a temporary disturbance of approximately 33.1 acres. Restoration of disturbed areas, such as staging areas and temporary access routes, would occur at the end of 3 years or when the plants become established enough such that they did not need any supplemental watering.

Straw bales would be placed over the 194-acre dust control areas prior to commencement of planting. The straw bales would provide immediate benefit to air quality by introducing a surface roughness that would break up wind speed and by reducing the amount of emissive area exposed to wind events, achieving an 85 to 95 percent reduction in emissions. As the native plant cover becomes established, it will eventually provide the same types of air quality benefits as the straw bales as a long-term solution to controlling the emissive areas.

2.6.2 Construction Impacts

During construction of the proposed project / proposed action, there is a potential to create air quality impacts through the use of heavy-duty construction equipment and through vehicle trips generated from construction workers traveling to and from the proposed project / proposed action property. Potential emission estimates from construction activities are based on emission factors and construction scenario information for development at the proposed project / proposed action property. The total amount of construction, including duration and level of construction activity occurring at the proposed project / proposed action property, would influence the estimated construction emissions and resulting potential impacts. Therefore, the emission forecasts are based on conservative assumptions about the construction scenario, with a large amount of construction activity occurring in a relatively short time frame. In addition, worker commute trips would vary throughout the construction period. This analysis used the highest estimated number of worker commute trips. Due to the conservative nature of these assumptions, actual emissions from construction of the proposed project / proposed action would most likely be less than estimated emissions.

Construction emissions are expected to result from the following activities:

- Establishment of temporary access routes
- Delivery and placement of straw bales and delivery and planting of plants required for vegetation of the site
- Fuel combustion by on-site equipment
- Construction worker commute trips
- ATV travel for bale placement and planting

2.6.2.1 Construction Emissions

The daily regional construction emissions for the proposed project / proposed action were estimated using the CalEEMod, version 2013.2.2, emissions model (Table 2.6.2.1-1, *Unmitigated Estimated Daily Regional Construction Emissions*).

TABLE 2.6.2.1-1
UNMITIGATED ESTIMATED DAILY REGIONAL CONSTRUCTION EMISSIONS

	Construction Emissions (Pounds/Day)					
Off-Road Emission Sources	**VOCs**	**NOx**	**CO**	**SOx**	**$PM_{2.5}$**	**PM_{10}**
Site preparation	8.98	102.12	45.57	0.09	4.23	5.64
Distribute straw bales on sand dunes	16.60	187.66	106.26	0.16	14.69	22.21
Planting and watering	56.67	660.60	328.34	0.65	35.46	48.09
Clean up and restoration	18.10	205.61	114.21	0.18	15.22	21.91
Maximum Off-Road Emissions	**56.67**	**660.60**	**328.34**	**0.65**	**35.46**	**48.09**
Mobile Sources	**VOCs**	**NO_x**	**CO**	**SO_x**	**$PM_{2.5}$**	**PM_{10}**
Delivery trucks and employee commutes	0.25	0.31	3.62	0.00	41.97	420.41
Maximum Regional Total	**56.91**	**660.90**	**331.96**	**0.65**	**77.43**	**468.50**
Significant? *	NA	NA	NA	NA	NA	NA

KEY: NA = not applicable.
NOTE: * The District does not have daily CEQA thresholds for criteria pollutants; therefore, the U.S. EPA annual *de minimis* threshold of 70 tons of PM_{10} per year was used.
SOURCE: Sapphos Environmental, Inc., Appendix B, *CalEEMod Output for the Proposed Project / Proposed Action*.

The annual regional construction emissions were estimated using the CalEEMod, version 2013.2.2, emissions model (Table 2.6.2.1-2, *Unmitigated Estimated Annual Regional Construction Emissions*). The annual regional construction emissions associated with construction would not be expected to exceed the U.S. EPA *de minimis* threshold for PM_{10}.

TABLE 2.6.2.1-2
UNMITIGATED ESTIMATED ANNUAL REGIONAL CONSTRUCTION EMISSIONS

	Air Pollutant Emissions (Tons/Year)					
Emission Source	**VOCs**	**NO_x**	**CO**	**SO_x**	**$PM_{2.5}$**	**PM_{10}**
Maximum off-road construction emissions	0.00	0.01	0.14	0.00	1.52	15.25
Delivery trucks and employee commutes	2.27	26.42	13.13	0.03	1.42	1.92
Maximum Regional Total	**3.48**	**39.93**	**21.00**	**0.04**	**5.36**	**32.56**
U.S. EPA *De Minimis* Thresholds (Tons/Year)*	NA	NA	NA	NA	NA	70
Significant?	NA	NA	NA	NA	NA	No

KEY: NA = not applicable.
NOTE: * The District does not have daily CEQA thresholds for criteria pollutants; therefore, the U.S. EPA annual *de minimis* threshold of 70 tons of PM_{10} per year was used.
SOURCE: Sapphos Environmental, Inc., Appendix B, *CalEEMod Output for the Proposed Project / Proposed Action*.

2.6.2.2 Localized Construction Impacts

Toxic air contaminants' (TACs) impacts at the proposed project / proposed action property can be attributed primarily to diesel particulate emissions associated with the use of heavy-duty equipment during construction and have been analyzed using the standard health risk assessment methodology to determine individual cancer risk of a person continuously exposed to TACs over a 70-year lifetime. Due to the relatively short-term construction schedule of approximately 11 months, construction-related TACs emissions of the proposed project / proposed action would be expected to be below the level of significance.

Odors at the proposed project / proposed action property can be emitted from equipment exhaust. However, since the construction of the proposed project / proposed action has a relatively short-term schedule and since odors are normally localized and confined, an odor nuisance is less likely to happen. The construction of the proposed project / proposed action would use typical construction equipment, and odors at the site would be typical for most construction sites. In addition, construction of the proposed project / proposed action would be required to comply with District Rule 419; therefore, odor impacts from the construction would be expected to be below the level of significance.

Localized on-site (off-road) emissions are the maximum construction emissions due to off-road construction equipment and unpaved off-road travel by employees and delivery trucks (Tables 2.6.2.1-1 and 2.6.2.1-2). Localized on-site (off-road) emissions for the proposed project / proposed action would not exceed significance thresholds for PM.

CO is considered a localized problem and requires additional analysis when a proposed project / proposed action is likely to expose sensitive receptors to localized levels of CO concentrations from vehicles, which are known as CO "hotspots." The maximum daily regional total CO emissions from construction of the proposed project / proposed action is approximately 334.86 pounds/day (Table 2.6.2.1-1), and the maximum annual regional total CO emission from construction of the proposed project / proposed action is approximately 22.07 tons/year (Table 2.6.2.1-2). Construction of the proposed project / proposed action would require the use of off-road construction equipment, delivery trucks, and vehicles for employee commutes. CO concentrations could be increased during the construction. However, due to a maximum of 11-month construction period, the potential increase in CO concentrations at sensitive receptor locations would be limited to these 11 months. The District does not provide daily emission threshold for CO. Due to the short timeline of the construction and temporary nature of potential exposures to construction-related air emissions from the proposed project / proposed action, off-site residents, including adults and children, would not be expected to be significantly affected by the proposed project / proposed action. In addition, although off-site sensitive receptors would have a potentially longer exposure to the construction-related air emissions, the distance from the proposed project / proposed action property would be expected to minimize potential impacts to below the level of significance. There are no residences within the proposed project / proposed action site. However, the communities of Swansea and Keeler are adjacent to the proposed project / proposed action, and the Lone Pine Paiute-Shoshone Indian Reservation and the town of Lone Pine are approximately 10 miles to the northwest, all of which could potentially be defined as sensitive receptors (Figure 2.3.6-1). The nearest resident is 990 feet away from the boundary of the proposed project / proposed action and would not have significant impacts from the construction of the proposed project / proposed action. Therefore, impacts from the construction of the proposed project / proposed action at these sensitive receptors would be expected to be below the level of significance.

2.6.3 Operational Impacts

2.6.3.1 Operation and Maintenance Emissions

Operational air emissions at the proposed project / proposed action property are likely to result from mobile sources due to monitoring activities and annual watering, as needed. Operational equipment emissions were based on a worst-case scenario and calculated assuming a total of 100 days per year of equipment use, for a maximum 3-year time period. The CalEEMod emissions model was used to calculate emissions from operational equipment (Table 2.6.3.1-1, *Unmitigated Estimated Daily Operational Emissions*) and from mobile-source emissions due to employee commute trips.

TABLE 2.6.3.1-1
UNMITIGATED ESTIMATED DAILY OPERATIONAL EMISSIONS

Emission Sources	Air Pollutants (Pounds/Day)					
	VOCs	**NO_x**	**CO**	**SO_x**	**$PM_{2.5}$**	**PM_{10}**
Operational equipment	15.27	176.09	107.19	0.15	16.84	25.81
ATVs	0.07	0.03	0.40	0.00	2.27	22.72
Water trucks	5.15	60.69	27.30	0.07	2.16	2.58
Total	**20.49**	**236.81**	**134.89**	**0.22**	**21.27**	**51.11**
Mobile sources	0.03	0.01	0.18	0.00	1.01	10.10
Total Emissions	**20.52**	**236.82**	**135.07**	**0.22**	**22.28**	**62.21**
Significance?*	N/A	N/A	N/A	N/A	N/A	No

KEY: NA = not applicable.
NOTE: * The District does not have daily CEQA thresholds for criteria pollutants; therefore, the U.S. EPA annual *de minimis* threshold of 70 tons of PM_{10} per year was used.
SOURCE: Sapphos Environmental, Inc., Appendix B, *CalEEMod Output for the Proposed Project / Proposed Action*.

The annual operational emissions of PM_{10} were also shown to be below the U.S. EPA *de minimis* thresholds of significance for the proposed project / proposed action (Table 2.6.3.1-2, *Unmitigated Estimated Annual Operational Emissions*). It is also important to note that the estimated emissions are likely to be higher than actual emissions from the proposed project / proposed action due to the conservative assumptions used for emission modeling. The long-term goal of the proposed project / proposed action is the establishment of a self-sustaining native vegetation cover to control dust with minimal long-term maintenance; therefore, operation and maintenance and associated emissions would be expected to be minimal after the initial 3 years following construction. In addition, the proposed project / proposed action would be anticipated to have an overall benefit to air quality during operation due to the proposed project / proposed action's purpose to reduce PM_{10} emissions through vegetation.

TABLE 2.6.3.1-2
UNMITIGATED ESTIMATED ANNUAL OPERATIONAL EMISSIONS

Emission Sources	Air Pollutants (Tons/Year)					
	VOCs	NO_x	CO	SO_x	$PM_{2.5}$	PM_{10}
Operational equipment	1.99	22.98	13.99	0.02	4.79	8.14
ATVs	0.00	0.00	0.06	0.00	0.27	2.69
Water trucks	0.67	7.92	3.56	0.00	0.29	0.40
Total	**2.66**	**30.90**	**17.61**	**0.02**	**5.35**	**11.23**
Mobile sources	0.00	0.00	0.03	0.00	0.12	1.19
Total Emissions	**2.66**	**30.90**	**17.64**	**0.02**	**5.47**	**12.42**
U.S. EPA *De Minimis* Threshold	NA	NA	NA	NA	NA	70
Exceedance of Significance?	NA	NA	NA	NA	NA	No

KEY: NA = not applicable.
NOTES: The District does not have daily CEQA thresholds for criteria pollutants; therefore, the U.S. EPA annual *de minimis* threshold of 70 tons of PM_{10} per year was used.
Annual operational equipment and mobile-source emissions are calculated assuming 48 working days per year.
SOURCE: Sapphos Environmental, Inc., Appendix B, *CalEEMod Output for the Proposed Project / Proposed Action*.

2.6.3.2 Local Operational Impacts

Carbon Monoxide

CO is considered a localized problem and requires additional analysis when a proposed project / proposed action is likely to expose sensitive receptors to localized levels of CO concentrations from vehicles, which are known as CO "hotspots." Due to the low number of vehicle trips anticipated for the proposed project / proposed action (8–10 per day), no significant increase in CO concentrations at sensitive receptor locations would be expected, and localized operational CO emissions would be below the level of significance.

Toxic Air Contaminants (TAC)

TAC impacts at the proposed project / proposed action property would result primarily from diesel particulate emissions associated with heavy-duty equipment operations. The operation of the proposed project / proposed action would not generate a substantial number of heavy-duty equipment operations or daily truck trips. Water truck trips during annual watering would be the primary contributor to the TAC level at the proposed project / proposed action property. However, the number of heavy-duty delivery trucks accessing the proposed project / proposed action property on a daily basis would be minimal, and the proposed project / proposed action area is remote and largely unpopulated; therefore, TAC emissions would not occur in large concentrations in populated areas. Therefore, operation-related TAC emissions would be below the level of significance and, consequently, the impact to human health would be below the level of significance. In addition, due to the fact that the proposed project / proposed action would significantly reduce Owens Lake dust emissions, which contain cadmium, arsenic, and other toxic metals, it would also serve to reduce TAC emissions in the area.

Visibility-Reducing Particles

The threshold for visibility under the CAAQS is correlated with the standard extinction coefficient of 0.23 per kilometer. Due to the fact that the proposed project / proposed action's operation does not involve area-source emissions that would be expected to impair visibility, the impact of the proposed project / proposed action to visibility would be below the level of significance**.**

Odor

Odor nuisances are typically associated with land uses and industrial operations, such as agricultural uses, wastewater treatment plants, food-processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. Since the proposed project / proposed action development includes placing straw bales and vegetation of an exposed sand dune, and does not include any land uses or industrial operations typically associated with odor nuisance, odor impacts from the proposed project / proposed action would be expected to be below the level of significance.

Daily operational emissions, TAC levels, visibility, and odor impacts would be expected to be below the level of significance. Therefore, the long-term exposure of sensitive receptors to the proposed project / proposed action's operational emissions would be expected to be below the level of significance. In addition, implementation of the proposed project / proposed action would greatly decrease the exposure of residents to PM_{10} emissions from Keeler Dunes in the long term.

2.6.4 Conformity Determination

The potential of the proposed project / proposed action to be subject to the conformity determination with the federal CAA and the NAAQS was analyzed. The General Conformity Rule requires the evaluation of the proposed project / proposed action's emissions against the *de minimis* level for all nonattainment pollutants in order to determine if the proposed project / proposed action would be subject to a conformity determination. The District is designated as nonattainment area for PM_{10} emissions; therefore, the proposed project / proposed action's annual unmitigated estimated construction and operational emissions were compared to the *de minimis* level for PM_{10} emissions (Table 2.6.4-1, *Conformity Determination*). Due to the fact that emissions of PM_{10} are expected to be below the *de minimis* threshold and that the overall purpose of the proposed project / proposed action is to reduce PM_{10} emissions, it is unlikely the proposed project / proposed action would be subject to a conformity determination.

TABLE 2.6.4-1
CONFORMITY DETERMINATION

Proposed Project / Proposed Action	Annual Unmitigated Estimated Nonattainment Air Pollutants (Tons/Year) PM_{10}
Construction	32.56
Operation	12.42
De minimis level	70
Subject to conformity determination?	No

2.6.5 Greenhouse Gas Emissions

The proposed project / proposed action's global climate change impacts were analyzed quantitatively considering the operational scenario, size, and location. To quantify the amount of GHG emissions contributed by construction and operation of the proposed project / proposed action, the CalEEMod emissions model and the California Climate Action Registry's General Reporting Protocol were used. The proposed project / proposed action would be expected to have the potential to result in significant impacts related to global climate change if the proposed project / proposed action conflicts with the goal of reducing California's GHG emissions to the 1990 levels (427 million metric tons CO_{2e}, which is equivalent to approximately 10 tons CO_{2e} per capita) by 2020 as required by AB 32. Based on the suggested thresholds proposed by the CAPCOA,[66,67] the proposed project / proposed action would be expected to have the potential to result in significant impacts related to global climate change if the proposed project / proposed action emits more than 25,000 metric tons of CO_{2e} per year.

2.6.5.1 Qualitative Analysis of Greenhouse Gas Emission Impacts

The proposed project / proposed action's incremental impact to GHG emissions would be potentially significant if the size, nature, or duration of the construction phase would emit a substantial amount of GHGs. The construction phase of the proposed project / proposed action would take approximately 11 months to complete and would include the entire 194-acre property. During delivery of straw bales and planting, heavy-duty equipment would be operated, which, together with the large area under construction, would be expected to produce significant, but temporary, GHG emissions. Therefore, the GHG emissions due to the proposed project / proposed action's straw bale delivery and planting phases warrant a quantitative analysis.

During the operational phase, the proposed project / proposed action's GHG emissions would be expected to be below the level of significance. As described in Section 1.0, the proposed project / proposed action is primarily the placement of straw bales and the planting of vegetation. Therefore, although the use of maintenance equipment for the proposed project / proposed action would be expected to emit GHGs, the operational phase would be expected to result in a net decrease in regional GHG emissions due to the long-term carbon sequestration from the vegetation to be planted, as well as a reduction of PM_{10} emissions. Operation of the proposed project / proposed action would not be expected to have a significant detrimental impact on GHG emissions and would reduce GHG emissions in compliance with the goals of AB 32 by providing an additional sink for CO_{2e}, which would reduce GHG emissions compared to a business-as-usual scenario.

2.6.5.2 Quantitative Analysis of Greenhouse Gas Emission Impacts

Based on emissions modeling, construction activities would result in the emission of a maximum of approximately 3,668.47 metric tons of CO_{2e} since construction is anticipated to take approximately 11 months (Table 2.6.5.2-1, *CO_2 and CO_{2e} Emissions*). Operation of the proposed project / proposed action would result in the emission of approximately 2,694.96 metric tons of CO_{2e} per year for up to 3 years (Table 2.6.5.2-1). The operational GHG emissions can be attributed to mobile sources and use of operational equipment such as water trucks. However, it is anticipated

[66] California Air Pollution Control Officers Association. January 2008. *CEQA and Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act*. Sacramento, CA.

[67] U.S. Department of Energy, Energy Information Administration. Voluntary Reporting of Greenhouse Gases Program. Washington, DC. Available at: http://www.eia.gov/oiaf/1605/

that impacts to GHG emissions associated with operation of the proposed project / proposed action would be greatly reduced due to sequestration of approximately 836.14 metric tons of CO_{2e} per year by the native plants (Appendix B). Therefore, the operation of the proposed project / proposed action would be expected to have a less than significant impact on GHG emissions, would not trigger the reference point of 25,000 metric tons of direct CO_{2e} that would warrant detailed consideration in the NEPA review set forth in the draft guidance by CEQ, would not exceed the CAPCOA reporting threshold of 25,000 metric tons per year. Therefore, it is expected that the overall GHG emissions resulting from construction and operation of the proposed project / proposed action would be consistent with CEQ's guidance and AB 32, and would be below the level of significance.

TABLE 2.6.5.2-1
CO_2 AND CO_{2e} EMISSIONS

Construction Emission Sourced*	**CO_2 Emissions**	**CO_{2e} Emissions**
	Metric Tons/Year	**Metric Tons/Year**
Maximum Construction Emissions	**3,645.93**	**3,668.47**
Operational Emission Sources**	**Metric Tons/Year**	**Metric Tons/Year**
Operational Activity	1,856.42	1,868.06
ATVs	3.18	3.19
Water Trucks	818.58	823.71
Mobile Sources	1.41	1.42
Maximum Operational Emissions	**2,679.59**	**2,694.96**

NOTES: * Construction-related emissions are anticipated to last for up to 11 months.
** Operation-related emissions are anticipated to last for up to 3 years.

2.6.6 Valley Fever

The state has not adopted thresholds of significance for valley fever; however, the likelihood of the occurrence of valley fever can be determined based on the proposed project / proposed action location. The proposed project / proposed action is located immediately northwest of the community of Keeler in Inyo County, California and is approximately 194 acres in size and is located within a 1.36-square-mile study area. The North Sand Sheet (NSS) soil composition is primarily made up of sediment from the Owens River, with a smaller portion from the Inyo Mountains east of the lake. Exposure of the NSS to high winds following desiccation of Owens Lake resulted in movement of the lake bed sediments to the southeast, forming a deposit of aeolian material on the adjacent alluvial fan (Keeler Fan).[68] Over time, wind and water have reworked the Keeler Dunes sand deposits, which currently extend over an approximately 1.36-square-mile area. The Keeler Dunes appear to be spreading to the east and southeast toward the community of Keeler and the foothills of the Inyo Mountains. The proposed project / proposed action property is not underlain by the type of sediments that are known to contain valley fever spores. Considering that the proposed project / proposed action will comply with the District Rule 401 DCMs, the risk of contracting valley fever in connection with the proposed project / proposed action is considered to be below the level of significance.

[68] Lancaster, N. March 2012. *Development of the Keeler Dunefield, Inyo County, California, Part 1—Analysis of Aerial Photographs and Satellite Imagery*. Prepared by: DRI. Prepared for: Great Basin Unified Air Pollution Control District.

2.7 CUMULATIVE IMPACT ANALYSIS

2.7.1 Regional Impacts

In addition to coordinating with their internal planning personnel, the District and BLM contacted the State Lands Commission, Inyo County, and LADWP to seek out information regarding past, present, and reasonably foreseeable probable future projects within the OVPA. The District and the BLM identified nine past, present, and reasonably foreseeable probable future projects that were considered in the evaluation of the potential for the proposed project / proposed action to result in cumulative significant impacts (Figure 2.7.1-1, *Related Projects*).

2003 and 2008 SIP

The analysis of impacts to environmental resources resulting from construction, operation, and maintenance of the 194 acres of DCMs in the EIR/EA considers the cumulative effects of these measures when combined with the related 29.8 square miles (19,072 acres) of DCMs that were installed between 1999 and 2006 as provided in the 2003 SIP. Based on data from July 2002 through June 2004, in December 2006, the Air Pollution Control Officer completed the required supplemental control requirements analysis and issued determination that additional areas of the dry lake bed would require DCMs to meet the NAAQS. Based on that supplemental analysis and subsequent discussions with the LADWP, it was agreed that additional DCMs would be implemented on 15.2 square miles of the dry lake bed (13.2 square miles for Phases 7 and 7A and 2.0 square miles for Phase 8) in support of compliance with the NAAQS for PM_{10}.

Lower Owens River Project

The Lower Owens River Project (LORP) is a joint effort between LADWP and Inyo County, which proposes to implement a large-scale habitat restoration project in the Owens Valley north of Owens Lake and outside the proposed project / proposed action area. The project's main objective is to mitigate impacts related to groundwater pumping by LADWP from 1970 to 1990. The LORP's project elements include (1) releasing water to the Lower Owens River to enhance native and game fisheries and riparian habitats along 62 miles of the river, (2) providing water to the Owens River delta to maintain and enhance various wetland and aquatic habitats, (3) enhancing a 1,500-acre off-river area with seasonal flooding and land management to benefit wetlands and waterfowl, and (4) maintaining several off-river lakes and ponds. In addition, the project also includes the construction of a pump station to capture and recover some of the water released to the river as well as range improvements and modified grazing practices on leases in the LORP project area. The EIR/EA prepared for this proposed project / proposed action identified six immitigable significant impacts to the environment:[69]

- Water quality degradation and fish kills during initial releases to the river
- Possible reduction in existing flows to the delta that could adversely affect existing wetland habitats
- Degradation of brine pool transition and associated shorebird habitat due to reduced flow to the delta

[69] City of Los Angeles Department of Water and Power, and Inyo County Water Department. 23 June 2004. *Final Environmental Impact Report and Environmental Impact Statement, Lower Owens River Project, Inyo County, California*. Bishop, CA.

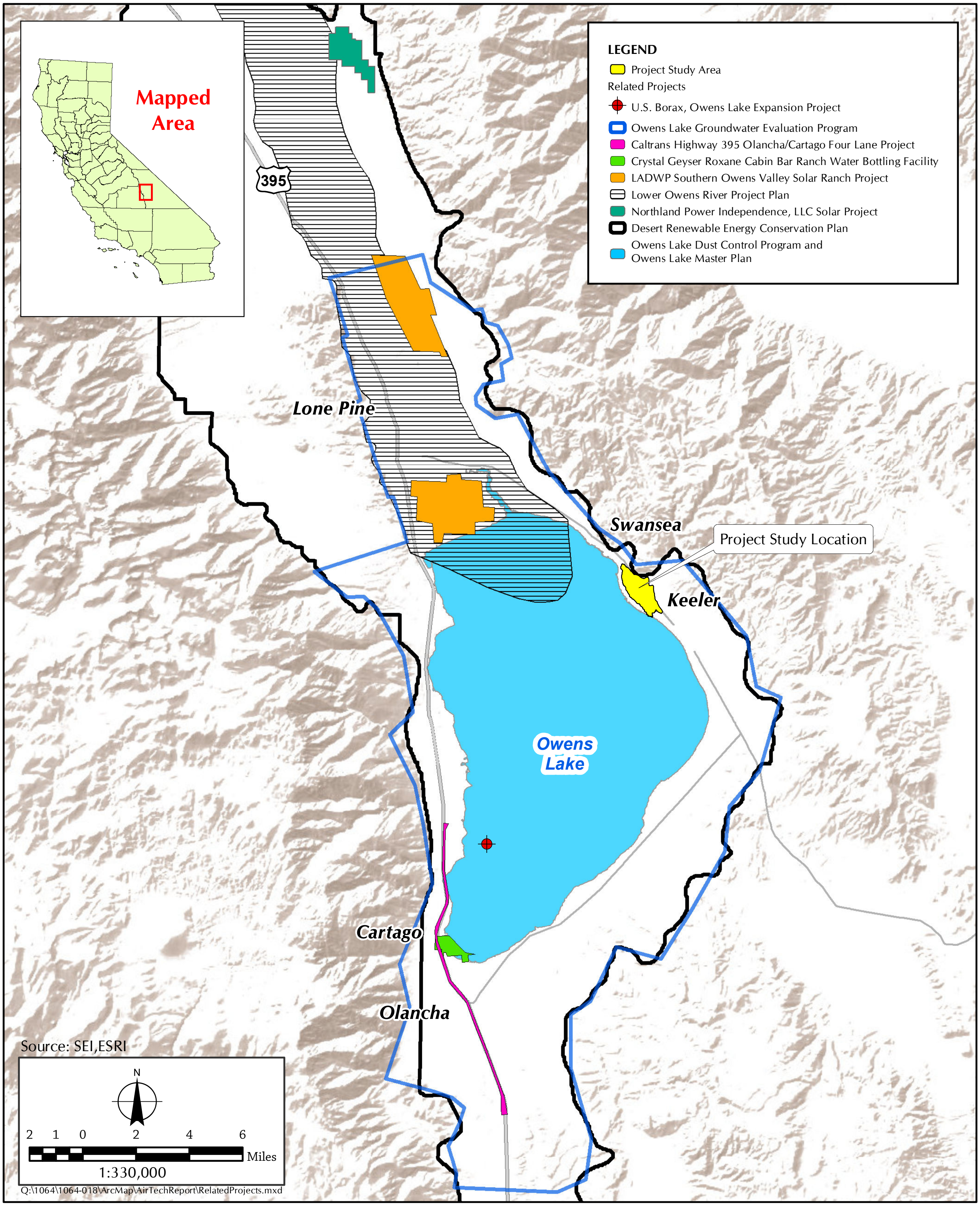

FIGURE 2.7.1-1

Cumulative Projects in the Vicinity of the Proposed Project / Proposed Action

- Conversion of 2,873 acres of native upland habitats to wetlands
- Potential increase in mosquito populations along the river
- Potential increase in saltcedar (a nonnative weed)

Owens Lake Master Project

The intent of the draft Owens Lake Master Project (OLMP) is to provide a framework to manage the diverse resources of the lake, while continuing to control dust emissions. Owens Lake resources identified by OLMP include habitat, public access and recreation, open space and scenic amenities, a rich cultural history, grazing and mining resources, and opportunities for renewable energy and economic development. The Planning Committee for the OLMP is a decision making group made up of individuals representing diverse interests. The OLMP[70] includes eight goals:

- Control dust on the Owens Lake bed to obtain good air quality and reduce the dust-related public health risk

- Water use efficiency and water conservation shall be a priority when implementing dust control efforts on the Owens Lake bed

- Protect, create, and/or enhance ecological resources at Owens Lake

- Create a Master Plan that can be flexible in the future and that is sustainable from a climate-change and water-use-efficiency standpoint

- Promote economic development in the area as well as tourism, public access, an educational opportunities at Owens Lake

- Create a viewshed that is in harmony with the surrounding rural environment while recognizing the need for flexibility and balance between Public Trust values and potential future uses, including renewable energy projects

- Protect cultural resources

- Explore opportunities for renewable energy development

Owens Lake Groundwater Evaluation Program

The Owens Lake Groundwater Evaluation Program (OLGWEP) was initiated in 2009 by LADWP, in cooperation with the District and the Inyo County Water Department. The goal of the program is to ensure the future availability of water for the dust mitigation measures while protecting the Owens Lake environment. Specifically, the LADWP is evaluating Owens Lake groundwater for supplying water to a portion of the dust control activities. A conceptual hydrogeological model has been completed to date.

[70] Inyo County Planning Committee. December 2011. *Draft Owens Lake Master Plan*. Review Draft, Appendix B. Independence, CA.

Crystal Geyser Roxane Cabin Bar Ranch Water Bottling Facility

The proposed project would involve construction of a spring water bottling facility and ancillary facilities utilizing groundwater from four existing groundwater wells on-site. A Draft EIR was prepared for the project and was submitted for public review on August 2012.[71] The water bottling facility would include a 198,500-square-foot bottling plant and an approximately 40,000-square-foot storage warehouse. Ancillary facilities include a rooftop solar array, fire suppression building, fire access road, parking and truck staging area, and a new access road to U.S. Highway 395. Construction of Phase I, which includes a new access road, storm water detention basin, leach mound system, fire suppression building, hydrants and access road, is anticipated to be initiated in 2013. Construction of the bottling facility is anticipated to be initiated in 2017.

U.S. Borax, Owens Lake Expansion Project / Conditional Use Permit #02-13 / Reclamation Plan #02-1

The U.S. Borax, Owens Lake Expansion Project / Conditional Use Permit #02-13 / Reclamation Plan #02-1 project proposes to install a trona ore processing facility at Owens Lake.[72] The facility would consist of portable and mobile washing equipment located on the lake bed and a calcining[73] and drying unit on the western shore. The project construction is anticipated to be constructed beyond 2015.[74] The project's main objective is to allow U.S. Borax's Boron, California, operations to meet its soda ash requirements without purchasing processed trona ore from the market. The EIR for this project identified evaluated impacts to 10 environmental resources:[75]

- Aesthetics
- Air quality
- Biological resources
- Hazards and hazardous materials
- Hydrology and water quality
- Land use and planning
- Noise
- Recreation
- Transportation and traffic
- Utilities and service systems

LADWP Southern Owens Valley Solar Ranch

A Notice of Preparation of an EIR was published in September 30, 2010. The project would be located adjacent to the Owens River and would involve the development of a net generation capacity of 200 megawatts of solar photovoltaic electrical energy and auxiliary equipment over

[71] Inyo County Planning Department. August 2012. *Crystal Geyser Roxane Cabin Bar Ranch Water Bottling Facility, Draft Environmental Impact Report*. Independence, CA. Available at: http://inyoplanning.org/projects.htm

[72] Inyo County Planning Department. January 2004. *Trona Processing Upgrade Project Environmental Impact Report.* State Clearinghouse No. 2003041127. Independence, CA.

[73] Calcining is a high-temperature heating process.

[74] Kingsley, Matt, Rio Tinto Minerals, Lone Pine, CA. 20 September 2012. Personal conversation with D. Grotzinger, Sapphos Environmental, Inc., Pasadena, CA.

[75] Inyo County Planning Department. January 2004. *Trona Processing Upgrade Project Environmental Impact Report.* State Clearinghouse No. 2003041127. Independence, CA.

approximately 1,600 acres of a 3,100-acre site in southern Owens Valley north of Owens Lake. The EIR will address 17 environmental factors potentially affected by the project.

Desert Renewable Energy Conservation Plan

The Desert Renewable Energy Conservation Plan (DRECP)[76] is intended to conserve threatened and endangered species and natural communities in the Mojave and Colorado Desert regions of Southern California while facilitating timely permitting of renewable energy projects to help meet the state's goal of providing at least 33 percent of electricity generation through renewable energy by 2020 and the federal government's goal of increasing renewable energy generation on public land. The plan is intended to serve as a Natural Community Conservation Plan (NCCP) under the California Fish and Game code and a multiple-species Habitat Conservation Plan under the federal Endangered Species Act and will provide a basis for the issuance of take authorizations allowing the lawful take of covered species incidental to covered activities.

Caltrans Highway 395 Olancha/Cartago Four-Lane Project

The Caltrans Highway 395 Olancha/Cartago Four-Lane Project will widen approximately 12.6 miles of the two-lane highway to four lanes. The Initial Study with Proposed Mitigated Negative Declaration / Environmental Assessment was issued in August 2010.[77] The highway project is anticipated to be initiated in 2016. The Initial Study determined there would be no significant impact and no significant adverse effect with mitigation measures on floodplain, seismic hazards, recreation, air quality, water quality, noise, traffic, endangered species and wetlands, visual resources, utilities, and cultural resources.

Cumulative Regional Impacts

The proposed project, in consideration with the 2003 and 2008 State Implementation Plans (SIPs), the Owens Lake Master Plan, the Lower Owens River Project, and the Owens Lake Groundwater Evaluation Program, would not contribute to significant cumulative impacts to air quality and greenhouse gases. The goals and objectives of these related projects are similar to those of the proposed project with regard to controlling the dust emissions from the Keeler Dunes while minimizing impacts to the environment. The other five projects—Crystal Geyser Roxanne Cabin Bar Ranch Water Bottling Facility; U.S. Borax, Owens Lake Expansion Project / Conditional Use Permit #02-13 / Reclamation Plant #02-1; LADWP Southern Owens Valley Solar Ranch Project; Desert Renewable Energy Conservation Plan; and California Department of Transportation Highway 395 Olancha/Cartago Four-Lane Project—would not be constructed during the same time period as the proposed project / proposed action. In sum, the air quality impact of the proposed project / proposed action would not be cumulatively significant when viewed in connection with the air quality effects of the related past, current, and reasonably foreseeable future projects that have been identified.

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[76] California Energy Commission. Accessed 22 September 2012. Desert Renewable Energy Conservation Plan. Website. Available at: http://www.drecp.org

[77] U.S. Department of Transportation Federal Highway Administration, and State of California Department of Transportation. August 2010. *Olancha/Cartago Four-Lane Project, Initial Study with Proposed Mitigated Negative Declaration/Environmental Assessment*. Washington, DC, and Sacramento, CA. Available at: http://www.dot.ca.gov/dist9/projects/olancha/docs/draft_olancha-cartago_envir_doc.pdf

2.7.2 Consistency with Existing Air Quality Attainment Plans

The proposed project / proposed action would be expected to be consistent with the District's Air Quality Attainment Plans. The federal *Guideline on Air Quality Models* considers "nearby" sources to determine cumulative ambient impacts, where a nearby source is any source expected to cause a significant concentration gradient in the vicinity of the proposed new source.[78] Vicinity is defined as the impact area, which is a circular area with a radius extending from the source to the most distant point where the model predicts an impact in excess of the significance threshold.[79] Under federal guidance, no additional modeling would be required if the maximum impacts do not exceed the significance threshold. The initial modeling indicated that, after incorporation of mitigation measures, operation and maintenance of the proposed project / proposed action would not exceed the annual thresholds of significance; therefore, in accordance with New Source Review (NSR) regulations and PSD guidelines issued by the U.S. EPA, the proposed project / proposed action would not conflict with or obstruct implementation of the District's Air Quality Attainment Plans, cause a violation of the standards, or impact the attainment status of the District. Therefore, the proposed project / proposed action's contribution to cumulative impacts would be below the level of significance and less than cumulatively considerable.

2.8 MITIGATION MEASURES

2.8.1 Air Quality

In accordance with the 2008 SIP, contractors involved in implementation of dust control strategies must control and minimize fugitive dust emissions to comply with Great Basin Unified Air Pollution Control District Rules 400[80] and 401,[81] through application of best available control measures during construction activities. These requirements are intended to reduce, prevent, or mitigate PM_{10} emissions from the construction phase of the proposed project / proposed action in compliance with Rule 400 and 401. In accordance with the 2008 SIP, these measures shall be implemented for all areas of construction and maintenance activities, both on-site and off-site.

2.8.2 Greenhouse Gas Emissions

Operation of the proposed project / proposed action would not be expected to have any adverse impacts upon GHG emissions, and would reduce GHG emissions in compliance with the goals of AB 32. Therefore, no mitigation measures are required.

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[78] U.S. Environmental Protection Agency. 2003. "Revision to the Guideline on Air Quality Models: Adoption of a Preferred Long Range Transport Model and Other Revisions." Washington, DC. Available at: http://www.epa.gov/EPA-AIR/2003/April/Day-15/a8542.htm

[79] U.S. Environmental Protection Agency. 1998. "Air Quality Analysis for Prevention of Significant Deterioration (PSD)." Washington, DC. Available at: http://www.epa.gov/scram001/guidance/mch/saq1.txt

[80] Great Basin Unified Air Pollution Control District. Revised 18 January 1979. *Rule 400—Ringelmann Chart*. Bishop, CA. Available at: http://www.District.org/rulesandregulations/PDF/Rule401.pdf

[81] Great Basin Unified Air Pollution Control District. Revised 4 December 2006. *Rule 401—Fugitive Dust*. Bishop, CA. Available at: http://www.District.org/rulesandregulations/PDF/Rule401.pdf

2.8.3 Level of Significance after Mitigation

The CalEEMod model runs assumed a vehicle speed of 5 mph to assess the level of significance after mitigation. Additionally, model runs were performed assuming that exposed surfaces would be watered two times per day.

2.8.3.1 Construction Emissions

Implementation of the specified mitigation measures would ensure that daily fugitive dust emissions associated with construction would be reduced to the maximum extent feasible (Table 2.8.3.1-1, *Mitigated Estimated Daily Regional Construction Emissions*). Consequently, PM_{10} emissions would remain at below the thresholds of significance (Table 2.8.3.1-2, *Mitigated Estimated Annual Regional Construction Emissions*).

TABLE 2.8.3.1-1
MITIGATED ESTIMATED DAILY REGIONAL CONSTRUCTION EMISSIONS

Emission Source	Air Pollutant Emissions (Pounds/Day)					
	VOCs	**NO_x**	**CO**	**SO_x**	**$PM_{2.5}$****	**PM_{10}****
Off-Road Emission Source						
Site preparation	8.98	102.12	45.57	0.09	4.11	4.53
Distribute straw bales on sand dunes	16.60	187.66	106.26	0.16	8.36	9.51
Planting and watering[1]	56.67	660.60	328.34	0.65	25.94	28.84
Clean up and restoration	18.10	205.60	114.21	0.18	8.99	10.13
Maximum Off-Road Emissions	**56.67**	**660.60**	**328.34**	**0.65**	**25.94**	**28.84**
Mobile Sources						
Delivery trucks and employee commutes[2]	0.25	0.31	3.62	0.00	25.67	257.44
Maximum Regional Total	**8.98**	**102.12**	**45.57**	**0.09**	**4.11**	**4.53**
Significant?	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

KEY: NA = not applicable.
NOTES: * The District does not have CEQA thresholds for criteria pollutants. The U.S. EPA *de minimis* thresholds have been used to determine potential impact (Table 2.8.3.1-2). ** PM emissions assume compliance with the District Rule 400 and 401 and limiting vehicle speeds on unpaved roads to 5 mph. [1] Maximum off-road emissions occur during the planting and watering phase of construction. [2] Maximum mobile source emissions occur during the planting and watering phase of construction.
SOURCE: Sapphos Environmental, Inc., Appendix B, *CalEEMod Output for the Proposed Project / Proposed Action*.

TABLE 2.8.3.1-2
MITIGATED ESTIMATED ANNUAL REGIONAL CONSTRUCTION EMISSIONS

Emission Source	Air Pollutant Emissions (Tons/Year)					
	VOCs	**NO_x**	**CO**	**SO_x**	**$PM_{2.5}$****	**PM_{10}****
Maximum Regional Total	**3.48**	**39.93**	**21.00**	**0.04**	**3.41**	**19.63**
U.S. EPA *De Minimis* Threshold (Tons/Year)*	NA	NA	NA	NA	NA	70
Significant?	**NA**	**NA**	**NA**	**NA**	**NA**	**No**

KEY: NA = not applicable.
NOTES:* The District does not have CEQA thresholds for criteria pollutants. The U.S. EPA *de minimis* thresholds have been used to determine potential impact. ** PM emissions assume compliance with the District Rule 400 and 401 and limiting vehicle speeds on unpaved roads to 5 mph.
SOURCE: Sapphos Environmental, Inc. Appendix B, *CalEEMod Output for the Proposed Project / Proposed Action*.

2.8.3.2 *Operational Emissions*

Operational emissions of PM_{10} would remain below the level of significance with implementation of the specified mitigation measures (Table 2.8.3.2-1, *Mitigated Estimated Daily Operational Emissions*; and Table 2.8.3.2-2, *Mitigated Estimated Annual Operational Emissions*).

TABLE 2.8.3.2-1
MITIGATED ESTIMATED DAILY OPERATIONAL EMISSIONS

Emission Source	Air Pollutant Emissions (Pounds/Day)					
	VOCs	**NO_x**	**CO**	**SO_x**	**$PM_{2.5}$****	**PM_{10}****
Operational equipment	15.27	176.09	107.19	0.15	7.56	8.72
ATVs	0.07	0.03	0.40	0.00	2.27	22.72
Water trucks	5.15	60.69	27.30	0.07	2.13	2.34
Total	**20.49**	**236.81**	**134.89**	**0.22**	**11.96**	**33.33**
Mobile Sources	0.03	0.01	0.18	0.00	1.01	10.10
Total Emissions	**20.52**	**236.82**	**135.07**	**0.22**	**12.97**	**43.43**
Threshold (Pounds/Day)*	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
Exceedance of Significance?	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

KEY: NA = not applicable.
NOTES: * The District does not have CEQA thresholds for criteria pollutants. The U.S. EPA *de minimis* thresholds have been used to determine potential impact (Table 2.8.3.2-2). ** PM emissions assume compliance with the District Rule 400 and 401 and limiting vehicle speeds on unpaved roads to 5 mph.
SOURCE: Sapphos Environmental, Inc., Appendix B, *CalEEMod Output for the Proposed Project / Proposed Action*.

TABLE 2.8.3.2-2
MITIGATED ESTIMATED ANNUAL OPERATIONAL EMISSIONS

Emission Source	Air Pollutant Emissions (Tons/Year)					
	VOCs	**NO_x**	**CO**	**SO_x**	**$PM_{2.5}$****	**PM_{10}****
Operational equipment	1.99	22.98	13.99	0.02	1.16	1.46
ATVs	0.00	0.00	0.06	0.00	0.27	2.67
Water trucks	0.67	7.92	3.56	0.00	0.28	0.91
Total	**2.66**	**30.90**	**17.61**	**0.02**	**4.23**	**5.04**
Mobile Sources	0.00	0.00	0.03	0.00	0.12	1.19
Total Emissions	**2.66**	**30.90**	**17.64**	**0.02**	**4.35**	**6.23**
U.S. EPA *De Minimis* Threshold (Tons/Year)*	**NA**	**NA**	**NA**	**NA**	**NA**	**70**
Exceedance of Significance?	**NA**	**NA**	**NA**	**NA**	**NA**	**No**

KEY: NA = not applicable.
NOTES: The District does not have daily CEQA thresholds for criteria pollutants; therefore, the U.S. EPA annual *de minimis* threshold of 70 tons of PM_{10} per year was used. ** PM emissions assume compliance with the District Rule 400 and 401 and limiting vehicle speeds on unpaved roads to 5 mph.
SOURCE: Sapphos Environmental, Inc., Appendix B, *CalEEMod Output for the Proposed Project / Proposed Action*.

Agency for Toxic Substances and Disease Registry. Updated 2006. "Toxicological Profile for Vinyl Chloride." Atlanta, GA.

California Air Pollution Control Officers Association. January 2008. *CEQA and Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act*. Sacramento, CA.

California Air Pollution Control Officers Association. August 2010. *Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emissions Reduction from Greenhouse Gas Mitigation Measures*. Sacramento, CA.

California Air Resources Board. 29 March 2005. *Air Quality and Land Use Handbook: A Community Health Perspective*. Sacramento, CA.

California Air Resources Board. October 2007. *Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California Recommended for Board Consideration*. Sacramento, CA. Available at: http://www.arb.ca.gov/cc/ccea/meetings/ea_final_report.pdf

California Air Resources Board. November 2007. *Recent Research Findings: Health Effects of Particulate Matter and Ozone Air Pollution, November 2007*. Sacramento, CA. Available at: http://www.arb.ca.gov/research/health/fs/pm_ozone-fs.pdf

California Air Resources Board. 16 November 2007. *California 1990 Greenhouse Gas Emissions Level and 2020 Limit*. Sacramento, CA.

California Air Resources Board. 15 October 2008. *Climate Change Proposed Scoping Plan: A Framework for Change*. Sacramento, CA. Available at: http://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm

California Air Resources Board. 24 October 2008. *Preliminary Draft Staff Proposal: Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the California Environmental Quality Act*. Sacramento, CA. Available at: http://www.opr.ca.gov/ceqa/pdfs/Prelim_Draft_Staff_Proposal_10-24-08.pdf

California Air Resources Board. Reviewed 24 November 2009. *California Ambient Air Quality Standards (CAAQS)*. Available at: http://www.arb.ca.gov/research/aaqs/caaqs/caaqs.htm

California Air Resources Board. Updated 24 November 2009. "History of Sulfates Air Quality Standard." Sacramento, CA. Available at: http://www.arb.ca.gov/research/aaqs/caaqs/sulf-1/sulf-1.htm

California Air Resources Board. 25 January 2010. *Diesel Programs and Activities*. Sacramento, CA. Available at: http://www.arb.ca.gov/diesel/diesel.htm

California Air Resources Board. 25 April 2011. *AB 2588 Air Toxics "Hot Spots" Program*. Sacramento, CA. Available at: http://www.arb.ca.gov/ab2588/ab2588.htm

California Air Resources Board. 18 July 2011. *Toxic Air Contaminant Identification List*. Sacramento, CA. Available at: http://www.arb.ca.gov/toxics/id/taclist.htm

California Air Resources Board. Updated 30 March 2012. *Air Quality Analysis Guidance Handbook*. Sacramento, CA. Available at: http://www.aqmd.gov/ceqa/hdbk.html

California Air Resources Board. Updated 7 June 2012. Ambient Air Quality Standards. Available at: http://www.arb.ca.gov/research/aaqs/aaqs2.pdf

California Air Resources Board. Accessed 15 November 2012. *California Code of Regulations*, Title 17, Sections 60201, 60202, 60205, and 60210: "Final Regulation Order, Area Designations for State Ambient Air Quality Standards." Sacramento, CA.

California Air Resources Board. Accessed 6 November 2013. "Top 4 Summary" Website. Available at: http://www.arb.ca.gov/adam/topfour/topfour1.php

California Air Resources Board, Planning and Technical Support Division, Emission Inventory Branch. Revised January 2009. "Definitions of VOC and ROG." Sacramento, CA. Available at: http://www.arb.ca.gov/ei/speciate/voc_rog_dfn_1_09.pdf

California Climate Action Registry. January 2009. *California Climate Action Registry General Reporting Protocol, Version 3.1*. Los Angeles, CA.

California Climate Action Team. 3 April 2006. *Climate Action Team Report to Governor Schwarzenegger and the Legislature*. Sacramento, CA.

California Department of Finance. August 2011. *Historic Census Populations of Counties and Incorporated Cities in California 1850–2010*. Available at: http://www.dof.ca.gov/research/demographic/state_census_data_center/historical_census_1850-2010/view.php

California Department of Finance. January 2013. *State and County Population Projections by County, by Race/Ethnicity, and by Major Age Groups, 2010-2060 (by decade)*. Available at: http://www.dof.ca.gov/research/demographic/reports/projections/view.php

California Department of Justice, Office of the Attorney General. Updated 9 December 2008. *The California Environmental Quality Act Addressing Global Warming Impacts at the Local Agency Level*. Sacramento, CA.

California Energy Commission. Accessed 22 September 2012. Desert Renewable Energy Conservation Plan. Website. Available at: http://www.drecp.org

California Environmental Protection Agency, Office of Environmental Health Hazard Assessment. August 2003. *Air Toxics Hot Spots Program Risk Assessment Guidelines: The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*. Sacramento, CA. Available at: www.oehha.ca.gov/air/hot_spots/HRAguidefinal.html

California Environmental Protection Agency, Office of Environmental Health Hazard Assessment, and the American Lung Association. Accessed on 2 February 2010. "Health Effects of Diesel Exhaust." Sacramento, CA. Available at: http://www.oehha.org/public_info/facts/dieselfacts.html

California Governor's Office of Planning and Research. 19 June 2008. *CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act (CEQA) Review*. Technical Advisory. Sacramento, CA.

California Office of the Governor. 1 June 2005. Executive Order S-3-05. Sacramento, CA.

Chester LabNet. 1996. Chemical Analysis of Ambient Filters. Tigard, OR.

City of Los Angeles Department of Water and Power, and Inyo County Water Department. 23 June 2004. *Final Environmental Impact Report and Environmental Impact Statement, Lower Owens River Project, Inyo County, California*. Bishop, CA.

Great Basin Unified Air Pollution Control District. Revised 18 January 1979. *Rule 400—Ringelmann Chart*. Bishop, CA. Available at: http://www.District.org/rulesandregulations/PDF/Rule401.pdf

Great Basin Unified Air Pollution Control District. 9 December 1987. *Toxic Risk Assessment Policy*. Bishop, CA.

Great Basin Unified Air Pollution Control District. Adopted 10 May 1994. *Regulation XII—Conformity to State Implementation Plans of Transportation Plans, Programs, and Projects Developed, Funded or Approved under Title 23 U.S.C. or the Federal Transit Act, District Rule 1231(e)—Procedures for Determining Regional Transportation-Related Emissions*. Bishop, CA. Available at: http://www.arb.ca.gov/drdb/gbu/curhtml/reg-12.htm

Great Basin Unified Air Pollution Control District. Adopted 10 May 1994. *Regulation XIII—Conformity of General Federal Actions to State Implementation Plans*. Bishop, CA. Available at: http://www.arb.ca.gov/drdb/gbu/curhtml/reg-13.htm

Great Basin Unified Air Pollution Control District. Revised 4 December 2006. *Rule 401—Fugitive Dust*. Bishop, CA. Available at: http://www.District.org/rulesandregulations/PDF/Rule401.pdf

Great Basin Unified Air Pollution Control District. 28 January 2008. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan*. Bishop, CA.

Great Basin Unified Air Pollution Control District. Accessed 4 January 2012. *Major Past Policy Decisions*. Bishop, CA. Available at: http://www.gbuapcd.org/background.htm

Great Basin Unified Air Pollution Control District. Accessed 4 January 2012. *Particular Matter Air Pollution*. Bishop, CA. Available at: http://www.gbuapcd.org/pm10.htm

Great Basin Unified Air Pollution Control District. 7 September 2012. *Preliminary Staff Report: Origin and Development of the Keeler Dunes*. Bishop, CA.

Groeneveld, D.P., HydroBio Advanced Remote Sensing. 12 September 2012. Telephone conversation with D. Grotzinger, Sapphos Environmental, Inc., Pasadena, CA.

Holder, G., Great Basin Unified Air Pollution Control District, Bishop, CA. 9 October 2012. Telephone conversation with D. Grotzinger, Sapphos Environmental, Inc., Pasadena, CA.

Holder, G., Great Basin Unified Air Pollution Control District, Bishop, CA. 20 September 2013. Email to Eric Charlton, Sapphos Environmental, Inc., Pasadena, CA.

Intergovernmental Panel on Climate Change. Approved 12–17 November 2007. *Climate Change 2007: Synthesis Report, Summary for Policymakers*, p. 5. Valencia, Spain. Available at: http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf

Inyo County Planning Department. December 2001. *Inyo County General Plan, Public Safety Element*. Independence, CA.

Inyo County Planning Department. January 2004. *Trona Processing Upgrade Project Environmental Impact Report*. State Clearinghouse No. 2003041127. Independence, CA.

Inyo County Planning Committee. December 2011. *Draft Owens Lake Master Plan*. Review Draft, Appendix B. Independence, CA.

Inyo County Planning Department. August 2012. *Crystal Geyser Roxane Cabin Bar Ranch Water Bottling Facility, Draft Environmental Impact Report*. Independence, CA. Available at: http://inyoplanning.org/projects.htm

Kiddoo, Phill, Great Basin Unified Air Pollution Control District, Bishop, CA. 10 October 2012. Email to Makeba Pease, Sapphos Environmental, Inc., Pasadena, CA.

Kiddoo, Phill, Great Basin Unified Air Pollution Control District, Bishop, CA. 8 November 2013. Email to Adam Furman, Sapphos Environmental, Inc., Pasadena CA.

Kingsley, Matt, Rio Tinto Minerals, Lone Pine, CA. 20 September 2012. Personal conversation with D. Grotzinger, Sapphos Environmental, Inc., Pasadena, CA.

Lancaster, N. March 2012. *Development of the Keeler Dunefield, Inyo County, California, Part 1—Analysis of Aerial Photographs and Satellite Imagery*. Prepared by: DRI. Prepared for: Great Basin Unified Air Pollution Control District.

The White House Council on Environmental Quality. 18 February 2010. *Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions*. Washington, DC. Available at: http://www.whitehouse.gov/sites/default/files/microsites/ceq/20100218-nepa-consideration-effects-ghg-draft-guidance.pdf

U.S. Department of Energy, Energy Information Administration. Voluntary Reporting of Greenhouse Gases Program. Washington, DC. Available at: http://www.eia.gov/oiaf/1605/

U.S. Department of Transportation Federal Highway Administration, and State of California Department of Transportation. August 2010. *Olancha/Cartago Four-Lane Project, Initial Study with Proposed Mitigated Negative Declaration/Environmental Assessment*. Washington, DC, and Sacramento, CA. Available at: http://www.dot.ca.gov/dist9/projects/olancha/docs/draft_olancha-cartago_envir_doc.pdf

U.S. Environmental Protection Agency. 26 September 1996. "Approval and Promulgation of Implementation Plans and Redesignation of Puget Sound, Washington for Air Quality Planning Purposes: Ozone." In *Federal Register*, Vol. 61, No. 188. Washington, DC. Available at: http://yosemite.epa.gov/r10/airpage.nsf/283d45bd5bb068e68825650f0064cdc2/e1f3db8b006eff1a88256dcf007885c6/$FILE/61%20FR%2050438%20Seattle%20Tacoma%20Ozone%20MP.pdf

U.S. Environmental Protection Agency. 15 August 1997. *Transportation Conformity Rule Amendments: Flexibility and Streamlining*. Washington, DC. Available at: http://www.epa.gov/USEPA-AIR/1997/August/Day-15/a20968.htm

U.S. Environmental Protection Agency. 1998. "Air Quality Analysis for Prevention of Significant Deterioration (PSD)." Washington, DC. Available at: http://www.epa.gov/scram001/guidance/mch/saq1.txt

U.S. Environmental Protection Agency. Revised January 2000. Technology Transfer Network Air Toxics Web Site: "1,4-Dichlorobenzene (para-Dichlorobenzene)." Washington, DC. Available at: http://www.epa.gov/ttn/atw/hlthef/dich-ben.html

U.S. Environmental Protection Agency. Revised January 2000. Technology Transfer Network Air Toxics Web Site: "Acetaldehyde." Washington, DC. Available at: http://www.epa.gov/ttn/atw/hlthef/acetalde.html

U.S. Environmental Protection Agency. Revised January 2000. Technology Transfer Network Air Toxics Web Site: "Benzene." Washington, DC. Available at: http://www.epa.gov/ttn/atw/hlthef/benzene.html

U.S. Environmental Protection Agency. Revised January 2000. Technology Transfer Network Air Toxics Web Site: "Carbon Tetrachloride." Washington, DC. Available at: http://www.epa.gov/ttn/atw/hlthef/carbonte.html

U.S. Environmental Protection Agency. Revised January 2000. Technology Transfer Network Air Toxics Web Site: "Chromium Compounds." Washington, DC. Available at: http://www.epa.gov/ttn/atw/hlthef/chromium.html#ref1

U.S. Environmental Protection Agency. Revised January 2000. Technology Transfer Network Air Toxics Web Site: "Formaldehyde." Washington, DC. Available at: http://www.epa.gov/ttn/atw/hlthef/formalde.html

U.S. Environmental Protection Agency. Revised January 2000. Technology Transfer Network Air Toxics Web Site: "Methylene Chloride (Dichloromethane)." Washington, DC. Available at: http://www.epa.gov/ttn/atw/hlthef/methylen.html

U.S. Environmental Protection Agency. Revised January 2000. Technology Transfer Network Air Toxics Web Site: "Tetrachloroethylene (Perchloroethylene)." Washington, DC. Available at: httphttp://www.epa.gov/ttn/atw/hlthef/tet-ethy.html

U.S. Environmental Protection Agency. 2003. "Revision to the Guideline on Air Quality Models: Adoption of a Preferred Long Range Transport Model and Other Revisions." Washington, DC. Available at: http://www.epa.gov/EPA-AIR/2003/April/Day-15/a8542.htm

U.S. Environmental Protection Agency. Updated 6 November 2007. Technology Transfer Network Air Toxics Web Site: "Vinyl Chloride." Washington, DC. Available at: http://www.epa.gov/ttn/atw/hlthef/vinylchl.html

U.S. Environmental Protection Agency. Revised March 2009. Technology Transfer Network Air Toxics Web Site: "1,3-butadiene." Washington, DC. Available at: http://www.epa.gov/ttn/atw/hlthef/butadien.html

U.S. Environmental Protection Agency. Updated 14 July 2009. *National Ambient Air Quality Standards (NAAQS)*. Available at: http://www.epa.gov/air/criteria.html

U.S. Environmental Protection Agency. 19 April 2011. *General Conformity Regulations*. Washington, DC. Available at: http://epa.gov/ttncaaa1/genconformity.html

U.S. Environmental Protection Agency. Updated 22 July 2011. *De Minimis Levels*. Available at: http://www.epa.gov/airquality/genconform/deminimis.html

U.S. Environmental Protection Agency. 5 August 2011. *Fast Facts: Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990–2009*. Washington, DC. Available at: http://epa.gov/climatechange/emissions/downloads11/GHG-Fast-Facts-2009.pdf

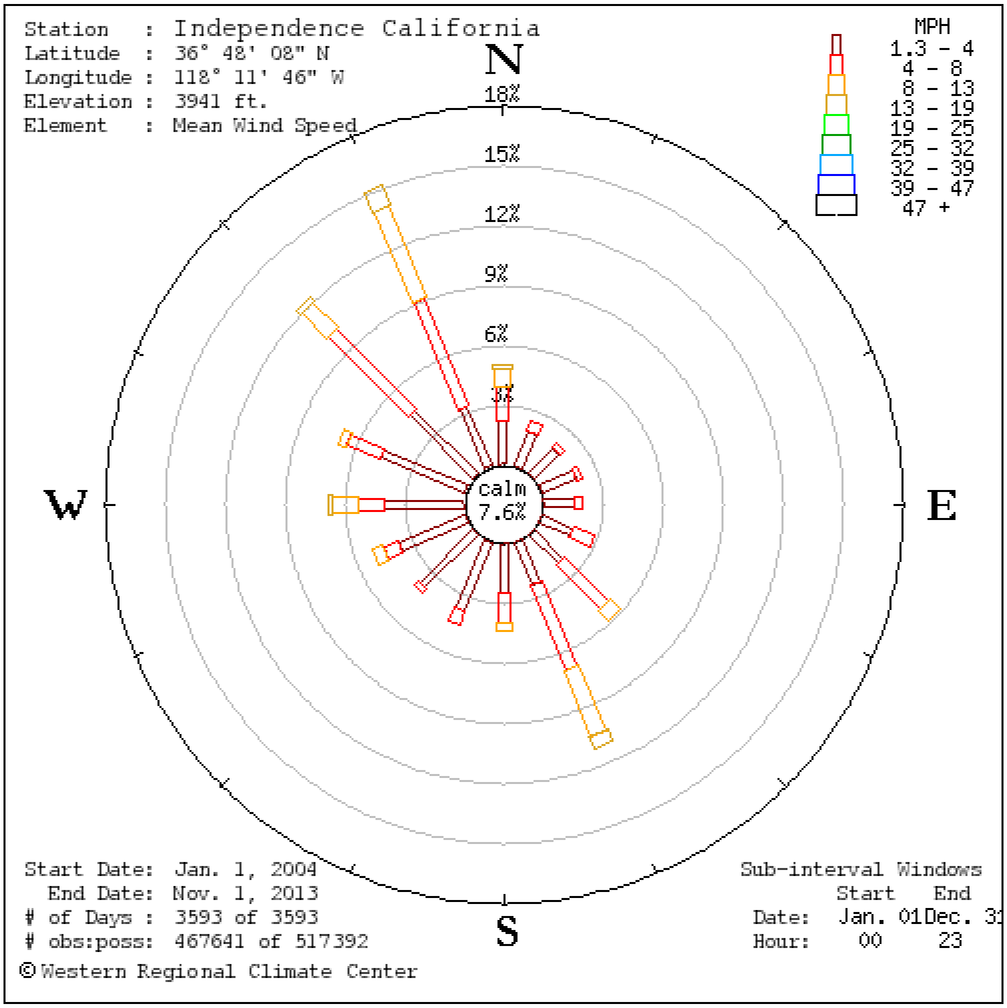
U.S. Environmental Protection Agency. 30 August 2011. *Green Book: Currently Designated Nonattainment Areas for All Criteria Pollutants*. Washington, DC. Available at: http://www.epa.gov/oaqps001/greenbk/ancl3.html

U.S. Environmental Protection Agency. Revised December 2012. Technology Transfer Network Air Toxics Web Site: "Arsenic Compounds." Washington, DC. Available at: http://www.epa.gov/ttn/atw/hlthef/arsenic.html

U.S. Environmental Protection Agency. Updated 11 June 2013. "Sulfur Dioxide (SO_2)—NAAQS Implementation." Washington, DC. Available at: http://www.epa.gov/ttn/naaqs/so2/index.html

U.S. Supreme Court. 2 April 2007. *Massachusetts, et al. v. Environmental Protection Agency, et al.* 549 U.S. 1438; 127 S. Ct. 1438. Washington, DC.

APPENDIX A
WIND AND CLIMATE DATA



Independence California - Wind Frequency Table (percentage)

Latitude : 36° 48' 08" N
Longitude : 118° 11' 46" W
Elevation : 3941 ft.
Element : Mean Wind Speed

Start Date : Jan. 1, 2004
End Date : Nov. 1, 2013
# of Days : 3593 of 3593
obs : poss : 467641 of 517392

Sub Interval Windows	Start	End
Date	Jan. 01	Dec. 31
Hour	00	23

(Greater than or equal to initial interval value and Less than ending interval value.)

Range (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total
1.3 - 4	2.2	1.8	1.7	1.8	1.5	1.7	2.0	2.3	2.5	3.7	3.7	3.5	4.0	4.5	4.4	3.2	44.7
4 - 8	1.7	0.5	0.3	0.3	0.4	1.1	3.1	4.6	1.5	0.8	0.3	0.8	1.3	1.8	5.6	5.8	29.9
8 - 13	0.9	0.1	0.0	0.0	0.0	0.0	0.7	3.5	0.4	0.1	0.1	0.6	1.3	0.4	1.8	5.0	14.8
13 - 19	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.6	0.0	0.0	0.0	0.1	0.3	0.1	0.3	1.1	2.8

19 - 25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
25 - 32	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
32 - 39	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39 - 47	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
47 -	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total(%)	5.0	2.4	2.0	2.1	1.9	2.9	6.0	11.1	4.4	4.5	4.1	5.0	6.8	6.9	12.2	15.1	92.3
Calm (<1.3)																	7.6
Ave Speed	5.7	3.5	3.1	3.0	3.2	3.9	5.4	7.2	4.3	3.1	2.8	4.1	5.1	3.9	5.5	7.4	4.8

Independence California - Hourly Wind Statistics Table

Latitude : 36° 48' 08" N
Longitude : 118° 11' 46" W
Elevation : 3941 ft.
Element : Mean Wind Speed

Start Date : Jan. 1, 2004
End Date : Nov. 1, 2013
\# of Days : 3593 of 3593
\# obs : poss : 467641 of 517392

Sub Interval Windows

	Start	End
Date	Jan. 01	Dec. 31
Hour	00	23

Time - Time of Day (L.S.T.)
Speed - Average (Scalar) Speed in MPH
U-Vel - East-West Velocity, Positive to East
V-Vel - North-South Velocity, Positive to North
Res Spd - Vector Average (resultant) Speed in MPH
Res Dir - Vector Average (resultant) Direction
Dir Con - Directional Constancy (Res Spd/Speed)
Num Spd - Number of Wind Speed Observations
Num Dir - Number of Wind Direction Observations

Time	Speed	U-Vel	V-Vel	Res Spd	Res Dir	Dir Con	Num Spd	Num Dir
0	3.8	2.0	-1.1	2.3	300	0.596	19497	19497
1	3.8	2.1	-1.2	2.4	301	0.636	19494	19494
2	3.7	2.1	-1.4	2.5	303	0.673	19497	19497
3	3.6	2.0	-1.4	2.5	304	0.685	19498	19497
4	3.5	2.0	-1.4	2.5	305	0.699	19501	19500
5	3.6	1.9	-1.6	2.5	309	0.705	19512	19510
6	3.9	1.7	-2.2	2.8	322	0.717	19514	19512
7	4.6	1.4	-3.0	3.3	334	0.709	19514	19511
8	5.2	0.9	-3.3	3.4	345	0.660	19503	19493
9	5.4	0.2	-2.6	2.6	356	0.491	19499	19493
10	5.5	-0.5	-1.4	1.5	21	0.267	19498	19493
11	5.8	-1.0	-0.1	1.0	86	0.174	19496	19494

12	6.2	-1.2	0.8	1.4	124	0.230	19504	19499
13	6.4	-1.1	1.3	1.6	140	0.255	19495	19492
14	6.6	-0.8	1.5	1.7	154	0.261	19486	19483
15	6.5	-0.4	1.7	1.7	168	0.266	19474	19473
16	6.2	0.4	1.8	1.9	193	0.300	19460	19459
17	5.7	1.1	1.5	1.9	217	0.330	19447	19447
18	5.0	1.7	0.7	1.8	246	0.372	19449	19448
19	4.5	1.9	0.2	1.9	265	0.422	19442	19442
20	4.4	1.8	-0.1	1.8	274	0.411	19436	19433
21	4.2	1.8	-0.5	1.9	284	0.438	19449	19449
22	4.0	1.8	-0.8	2.0	292	0.491	19478	19477
23	3.9	1.9	-1.0	2.1	297	0.551	19498	19498
ALL	4.8	1.0	-0.6	1.1	299	0.236	467641	467591

INDEPENDENCE, CALIFORNIA (044232)

Period of Record Monthly Climate Summary

Period of Record : 1/ 1/1893 to 3/31/2013

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	54.3	58.2	65.6	73.0	82.0	91.4	97.9	96.0	88.7	76.9	64.0	54.3	75.2
Average Min. Temperature (F)	27.5	31.3	36.4	42.5	50.8	58.7	64.1	62.0	55.1	45.0	34.2	28.1	44.6
Average Total Precipitation (in.)	1.01	1.01	0.44	0.24	0.16	0.11	0.13	0.13	0.18	0.26	0.56	1.00	5.21
Average Total SnowFall (in.)	1.4	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	3.2
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0

Percent of possible observations for period of record.
Max. Temp.: 84% Min. Temp.: 84% Precipitation: 93.4% Snowfall: 89.2% Snow Depth: 83%
Check Station Metadata or Metadata graphics for more detail about data completeness.

APPENDIX B
CALEEMod OUTPUT FOR THE PROPOSED PROJECT

Keeler Dunes

Inyo County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Recreational	1.00	User Defined Unit	194.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.8	**Precipitation Freq (Days)**	34
Climate Zone	9			**Operational Year**	2015
Utility Company	Statewide Average				
CO2 Intensity (lb/MWhr)	958.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.011

1.3 User Entered Comments & Non-Default Data

Project Characteristics - The average wind speed, as recorded at the Bishop Airport Monitoring Station from 1992 to 2002, was approximately 8.4 miles per hour, which is 3.8 m/s.

Land Use - The proposed project site is 194 acres

Construction Phase - User-defined scenario

Off-road Equipment - user-defined

Off-road Equipment - User-defined scenario

Off-road Equipment - User-defined scenario

Off-road Equipment - User-defined scenario

Off-road Equipment - User-defined scenario

Trips and VMT - User-defined scenario

On-road Fugitive Dust - Assumed 95 percent of travel on unpaved roads

Vehicle Trips - User-defined scenario

Energy Use - User-defined scenario

Construction Off-road Equipment Mitigation - Vehicle speeds limited to 15 mph. Exposed areas watered two times per day.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	120.00	5.00
tblConstructionPhase	NumDays	120.00	130.00
tblConstructionPhase	NumDays	120.00	80.00
tblConstructionPhase	NumDays	120.00	10.00
tblGrading	AcresOfGrading	5.00	5.60
tblGrading	AcresOfGrading	0.00	194.00
tblGrading	AcresOfGrading	0.00	194.00
tblGrading	AcresOfGrading	0.00	5.60
tblLandUse	LotAcreage	0.00	194.00
tblOffRoadEquipment	HorsePower	255.00	358.00
tblOffRoadEquipment	HorsePower	255.00	358.00
tblOffRoadEquipment	HorsePower	255.00	358.00
tblOffRoadEquipment	HorsePower	255.00	358.00

tblOffRoadEquipment	HorsePower	97.00	75.00
tblOffRoadEquipment	HorsePower	97.00	75.00
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tblOffRoadEquipment	LoadFactor	0.40	0.59
tblOffRoadEquipment	LoadFactor	0.40	0.59
tblOffRoadEquipment	LoadFactor	0.40	0.59
tblOffRoadEquipment	LoadFactor	0.40	0.59
tblOffRoadEquipment	LoadFactor	0.37	0.55
tblOffRoadEquipment	LoadFactor	0.37	0.55
tblOffRoadEquipment	LoadFactor	0.37	0.55
tblOffRoadEquipment	LoadFactor	0.37	0.55
tblOffRoadEquipment	LoadFactor	0.29	0.43
tblOffRoadEquipment	LoadFactor	0.29	0.43
tblOffRoadEquipment	LoadFactor	0.20	0.30
tblOffRoadEquipment	LoadFactor	0.20	0.30

tblOffRoadEquipment	LoadFactor	0.41	0.61
tblOffRoadEquipment	LoadFactor	0.38	0.57
tblOffRoadEquipment	LoadFactor	0.38	0.57
tblOffRoadEquipment	LoadFactor	0.38	0.57
tblOffRoadEquipment	LoadFactor	0.38	0.57
tblOffRoadEquipment	LoadFactor	0.36	0.54
tblOffRoadEquipment	LoadFactor	0.36	0.54
tblOffRoadEquipment	LoadFactor	0.36	0.54
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	6.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	30.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	7.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	PhaseName		Distribute straw bales on sand dunes
tblOffRoadEquipment	PhaseName		Planting and watering
tblOffRoadEquipment	PhaseName		Distribute straw bales on sand dunes
tblOffRoadEquipment	PhaseName		Planting and watering
tblOffRoadEquipment	PhaseName		Distribute straw bales on sand dunes
tblOffRoadEquipment	PhaseName		Planting and watering
tblOffRoadEquipment	PhaseName		Distribute straw bales on sand dunes

tblOffRoadEquipment	PhaseName		Planting and watering
tblOffRoadEquipment	PhaseName		Clean up and restoration
tblOffRoadEquipment	PhaseName		Distribute straw bales on sand dunes
tblOffRoadEquipment	PhaseName		Planting and watering
tblOffRoadEquipment	PhaseName		Clean up and restoration
tblOffRoadEquipment	PhaseName		Distribute straw bales on sand dunes
tblOffRoadEquipment	PhaseName		Planting and watering
tblOnRoadDust	WorkerPercentPave	100.00	15.00
tblOnRoadDust	WorkerPercentPave	100.00	15.00
tblOnRoadDust	WorkerPercentPave	100.00	15.00
tblOnRoadDust	WorkerPercentPave	100.00	15.00
tblProjectCharacteristics	CO2IntensityFactor	1001.57	958.49
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.011
tblProjectCharacteristics	OperationalYear	2014	2015
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblProjectCharacteristics	WindSpeed	2.2	3.8
tblTripsAndVMT	WorkerTripNumber	15.00	10.00
tblTripsAndVMT	WorkerTripNumber	30.00	10.00
tblTripsAndVMT	WorkerTripNumber	100.00	20.00
tblTripsAndVMT	WorkerTripNumber	33.00	10.00
tblVehicleEF	HHD	0.03	0.13
tblVehicleEF	HHD	0.01	0.03
tblVehicleEF	HHD	0.00	0.13
tblVehicleEF	HHD	2.92	13.51
tblVehicleEF	HHD	2.05	3.74
tblVehicleEF	HHD	110.77	29.69
tblVehicleEF	HHD	0.10	0.10
tblVehicleEF	HHD	5.14	30.54

tblVehicleEF	HHD	6.03	10.13
tblVehicleEF	HHD	5.22	1.44
tblVehicleEF	HHD	0.02	0.34
tblVehicleEF	HHD	0.06	0.02
tblVehicleEF	HHD	0.04	0.03
tblVehicleEF	HHD	0.11	0.37
tblVehicleEF	HHD	0.01	1.2000e-003
tblVehicleEF	HHD	0.02	0.34
tblVehicleEF	HHD	0.03	0.02
tblVehicleEF	HHD	8.7890e-003	0.03
tblVehicleEF	HHD	0.10	0.37
tblVehicleEF	HHD	8.2710e-003	1.2000e-003
tblVehicleEF	HHD	8.5750e-003	8.0000e-004
tblVehicleEF	HHD	0.43	0.03
tblVehicleEF	HHD	0.54	2.86
tblVehicleEF	HHD	4.4350e-003	2.0000e-004
tblVehicleEF	HHD	0.29	0.76
tblVehicleEF	HHD	1.78	0.02
tblVehicleEF	HHD	5.78	2.01
tblVehicleEF	HHD	5.5950e-003	0.01
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	2.7680e-003	7.0000e-004
tblVehicleEF	HHD	8.5750e-003	8.0000e-004
tblVehicleEF	HHD	0.43	0.03
tblVehicleEF	HHD	0.62	3.26
tblVehicleEF	HHD	4.4350e-003	2.0000e-004
tblVehicleEF	HHD	0.33	0.86
tblVehicleEF	HHD	1.78	0.02

tblVehicleEF	HHD	6.22	2.17
tblVehicleEF	HHD	0.02	0.12
tblVehicleEF	HHD	0.01	0.03
tblVehicleEF	HHD	0.00	0.08
tblVehicleEF	HHD	2.12	8.85
tblVehicleEF	HHD	2.05	3.72
tblVehicleEF	HHD	85.04	22.29
tblVehicleEF	HHD	0.10	0.10
tblVehicleEF	HHD	5.30	32.08
tblVehicleEF	HHD	5.74	9.76
tblVehicleEF	HHD	4.86	1.30
tblVehicleEF	HHD	0.02	0.27
tblVehicleEF	HHD	0.06	0.02
tblVehicleEF	HHD	0.04	0.03
tblVehicleEF	HHD	0.11	0.37
tblVehicleEF	HHD	0.01	1.2000e-003
tblVehicleEF	HHD	0.02	0.27
tblVehicleEF	HHD	0.03	0.02
tblVehicleEF	HHD	8.7890e-003	0.03
tblVehicleEF	HHD	0.10	0.37
tblVehicleEF	HHD	8.2710e-003	1.2000e-003
tblVehicleEF	HHD	0.02	2.9000e-003
tblVehicleEF	HHD	0.49	0.03
tblVehicleEF	HHD	0.51	2.62
tblVehicleEF	HHD	7.7500e-003	8.0000e-004
tblVehicleEF	HHD	0.29	0.76
tblVehicleEF	HHD	1.76	0.02
tblVehicleEF	HHD	4.16	1.26

tblVehicleEF	HHD	5.9280e-003	0.01
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	2.3130e-003	5.0000e-004
tblVehicleEF	HHD	0.02	2.9000e-003
tblVehicleEF	HHD	0.49	0.03
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tblVehicleEF	HHD	7.7500e-003	8.0000e-004
tblVehicleEF	HHD	0.33	0.86
tblVehicleEF	HHD	1.76	0.02
tblVehicleEF	HHD	4.48	1.36
tblVehicleEF	HHD	0.03	0.14
tblVehicleEF	HHD	0.01	0.03
tblVehicleEF	HHD	0.00	0.15
tblVehicleEF	HHD	4.03	16.83
tblVehicleEF	HHD	2.06	3.76
tblVehicleEF	HHD	85.27	33.46
tblVehicleEF	HHD	0.10	0.10
tblVehicleEF	HHD	4.91	29.45
tblVehicleEF	HHD	5.85	10.35
tblVehicleEF	HHD	4.86	1.52
tblVehicleEF	HHD	0.03	0.39
tblVehicleEF	HHD	0.06	0.02
tblVehicleEF	HHD	0.04	0.03
tblVehicleEF	HHD	0.11	0.37
tblVehicleEF	HHD	0.01	1.2000e-003
tblVehicleEF	HHD	0.02	0.39
tblVehicleEF	HHD	0.03	0.02
tblVehicleEF	HHD	8.7890e-003	0.03

tblVehicleEF	HHD	0.10	0.37
tblVehicleEF	HHD	8.2710e-003	1.2000e-003
tblVehicleEF	HHD	0.03	1.0000e-004
tblVehicleEF	HHD	0.94	0.03
tblVehicleEF	HHD	0.58	3.03
tblVehicleEF	HHD	0.02	1.0000e-004
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tblVehicleEF	HHD	4.17	2.40
tblVehicleEF	HHD	5.1360e-003	0.01
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	2.3170e-003	7.0000e-004
tblVehicleEF	HHD	0.03	1.0000e-004
tblVehicleEF	HHD	0.94	0.03
tblVehicleEF	HHD	0.66	3.45
tblVehicleEF	HHD	0.02	1.0000e-004
tblVehicleEF	HHD	0.33	0.86
tblVehicleEF	HHD	2.01	0.02
tblVehicleEF	HHD	4.49	2.58
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tblVehicleEF	LDA	0.02	0.03
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tblVehicleEF	LDA	0.21	0.26
tblVehicleEF	LDA	0.28	0.38
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tblVehicleEF	LDA	2.7110e-003	0.01

tblVehicleEF	LDA	3.9660e-003	7.0000e-003
tblVehicleEF	LDA	0.02	0.01
tblVehicleEF	LDA	2.0000e-003	8.0000e-003
tblVehicleEF	LDA	2.4660e-003	0.01
tblVehicleEF	LDA	3.6060e-003	7.0000e-003
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tblVehicleEF	LDA	0.08	0.08
tblVehicleEF	LDA	0.54	0.09
tblVehicleEF	LDA	0.36	0.52
tblVehicleEF	LDA	3.5900e-003	3.5000e-003
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tblVehicleEF	LDA	0.09	0.04
tblVehicleEF	LDA	0.10	0.10
tblVehicleEF	LDA	0.54	0.09
tblVehicleEF	LDA	0.39	0.56
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	0.02	0.01
tblVehicleEF	LDA	2.20	2.53
tblVehicleEF	LDA	2.96	3.93
tblVehicleEF	LDA	0.31	0.30
tblVehicleEF	LDA	0.18	0.22
tblVehicleEF	LDA	0.25	0.32
tblVehicleEF	LDA	0.04	0.01
tblVehicleEF	LDA	2.7110e-003	0.01

tblVehicleEF	LDA	3.9660e-003	7.0000e-003
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tblVehicleEF	LDA	2.0000e-003	8.0000e-003
tblVehicleEF	LDA	2.4660e-003	0.01
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tblVehicleEF	LDA	0.27	0.28
tblVehicleEF	LDA	0.15	0.17
tblVehicleEF	LDA	0.08	0.09
tblVehicleEF	LDA	0.52	0.09
tblVehicleEF	LDA	0.27	0.34
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tblVehicleEF	LDA	0.27	0.28
tblVehicleEF	LDA	0.15	0.17
tblVehicleEF	LDA	0.10	0.11
tblVehicleEF	LDA	0.52	0.09
tblVehicleEF	LDA	0.28	0.37
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	0.02	0.03
tblVehicleEF	LDA	2.20	2.14
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tblVehicleEF	LDA	0.19	0.29
tblVehicleEF	LDA	0.25	0.41
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tblVehicleEF	LDA	2.7110e-003	0.01

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tblVehicleEF	LDA	0.63	0.10
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tblVehicleEF	LDT1	0.71	0.99
tblVehicleEF	LDT1	0.52	0.67
tblVehicleEF	LDT1	0.04	0.01
tblVehicleEF	LDT1	6.7850e-003	0.01

tblVehicleEF	LDT1	8.8680e-003	0.01
tblVehicleEF	LDT1	0.02	0.01
tblVehicleEF	LDT1	2.0000e-003	8.0000e-003
tblVehicleEF	LDT1	6.0870e-003	0.01
tblVehicleEF	LDT1	7.9660e-003	0.01
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tblVehicleEF	LDT1	0.54	0.44
tblVehicleEF	LDT1	0.24	0.11
tblVehicleEF	LDT1	0.30	0.33
tblVehicleEF	LDT1	1.82	0.38
tblVehicleEF	LDT1	0.92	1.17
tblVehicleEF	LDT1	4.2510e-003	4.3000e-003
tblVehicleEF	LDT1	1.0880e-003	1.1000e-003
tblVehicleEF	LDT1	0.33	0.23
tblVehicleEF	LDT1	0.54	0.44
tblVehicleEF	LDT1	0.24	0.11
tblVehicleEF	LDT1	0.35	0.38
tblVehicleEF	LDT1	1.82	0.38
tblVehicleEF	LDT1	0.99	1.25
tblVehicleEF	LDT1	0.04	0.05
tblVehicleEF	LDT1	0.05	0.04
tblVehicleEF	LDT1	7.77	8.71
tblVehicleEF	LDT1	7.93	9.13
tblVehicleEF	LDT1	0.12	0.24
tblVehicleEF	LDT1	0.61	0.85
tblVehicleEF	LDT1	0.46	0.57
tblVehicleEF	LDT1	0.04	0.01
tblVehicleEF	LDT1	6.7850e-003	0.01

tblVehicleEF	LDT1	8.8680e-003	0.01
tblVehicleEF	LDT1	0.02	0.01
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tblVehicleEF	LDT1	6.0870e-003	0.01
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tblVehicleEF	LDT1	0.63	0.59
tblVehicleEF	LDT1	0.43	0.43
tblVehicleEF	LDT1	0.30	0.34
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tblVehicleEF	LDT1	0.67	0.75
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tblVehicleEF	LDT1	1.0190e-003	1.0000e-003
tblVehicleEF	LDT1	0.70	0.82
tblVehicleEF	LDT1	0.63	0.59
tblVehicleEF	LDT1	0.43	0.43
tblVehicleEF	LDT1	0.35	0.39
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tblVehicleEF	LDT1	0.71	0.80
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tblVehicleEF	LDT1	0.63	1.09
tblVehicleEF	LDT1	0.46	0.73
tblVehicleEF	LDT1	0.04	0.01
tblVehicleEF	LDT1	6.7850e-003	0.01

tblVehicleEF	LDT1	8.8680e-003	0.01
tblVehicleEF	LDT1	0.02	0.01
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tblVehicleEF	LDT1	1.09	0.04
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tblVehicleEF	LDT1	0.73	0.02
tblVehicleEF	LDT1	0.31	0.34
tblVehicleEF	LDT1	2.29	0.44
tblVehicleEF	LDT1	0.68	1.38
tblVehicleEF	LDT1	4.5030e-003	4.3000e-003
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tblVehicleEF	LDT1	1.17	0.46
tblVehicleEF	LDT1	0.73	0.02
tblVehicleEF	LDT1	0.36	0.39
tblVehicleEF	LDT1	2.29	0.44
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tblVehicleEF	LDT2	0.03	0.03
tblVehicleEF	LDT2	0.03	0.03
tblVehicleEF	LDT2	3.32	3.29
tblVehicleEF	LDT2	6.72	9.01
tblVehicleEF	LDT2	0.18	0.20
tblVehicleEF	LDT2	0.44	0.53
tblVehicleEF	LDT2	0.58	0.73
tblVehicleEF	LDT2	0.04	0.01
tblVehicleEF	LDT2	3.0560e-003	0.02

tblVehicleEF	LDT2	4.3330e-003	0.01
tblVehicleEF	LDT2	0.02	0.01
tblVehicleEF	LDT2	2.0000e-003	8.0000e-003
tblVehicleEF	LDT2	2.7600e-003	0.02
tblVehicleEF	LDT2	3.9230e-003	0.01
tblVehicleEF	LDT2	0.15	0.10
tblVehicleEF	LDT2	0.28	0.21
tblVehicleEF	LDT2	0.11	0.05
tblVehicleEF	LDT2	0.13	0.12
tblVehicleEF	LDT2	0.99	0.18
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tblVehicleEF	LDT2	4.9000e-003	4.3000e-003
tblVehicleEF	LDT2	1.1320e-003	1.0000e-003
tblVehicleEF	LDT2	0.15	0.10
tblVehicleEF	LDT2	0.28	0.21
tblVehicleEF	LDT2	0.11	0.05
tblVehicleEF	LDT2	0.16	0.15
tblVehicleEF	LDT2	0.99	0.18
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tblVehicleEF	LDT2	0.03	0.03
tblVehicleEF	LDT2	0.03	0.02
tblVehicleEF	LDT2	3.59	3.76
tblVehicleEF	LDT2	4.50	5.26
tblVehicleEF	LDT2	0.18	0.20
tblVehicleEF	LDT2	0.38	0.46
tblVehicleEF	LDT2	0.51	0.62
tblVehicleEF	LDT2	0.04	0.01
tblVehicleEF	LDT2	3.0560e-003	0.02

tblVehicleEF	LDT2	4.3330e-003	0.01
tblVehicleEF	LDT2	0.02	0.01
tblVehicleEF	LDT2	2.0000e-003	8.0000e-003
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tblVehicleEF	LDT2	3.9230e-003	0.01
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tblVehicleEF	LDT2	0.20	0.19
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tblVehicleEF	LDT2	0.93	0.17
tblVehicleEF	LDT2	0.39	0.44
tblVehicleEF	LDT2	5.2330e-003	4.9000e-003
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tblVehicleEF	LDT2	0.32	0.36
tblVehicleEF	LDT2	0.32	0.29
tblVehicleEF	LDT2	0.20	0.19
tblVehicleEF	LDT2	0.16	0.16
tblVehicleEF	LDT2	0.93	0.17
tblVehicleEF	LDT2	0.41	0.47
tblVehicleEF	LDT2	0.03	0.03
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	3.59	3.29
tblVehicleEF	LDT2	4.57	10.93
tblVehicleEF	LDT2	0.18	0.20
tblVehicleEF	LDT2	0.39	0.59
tblVehicleEF	LDT2	0.51	0.79
tblVehicleEF	LDT2	0.04	0.01
tblVehicleEF	LDT2	3.0560e-003	0.02

tblVehicleEF	LDT2	4.3330e-003	0.01
tblVehicleEF	LDT2	0.02	0.01
tblVehicleEF	LDT2	2.0000e-003	8.0000e-003
tblVehicleEF	LDT2	2.7600e-003	0.02
tblVehicleEF	LDT2	3.9230e-003	0.01
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tblVehicleEF	LDT2	0.58	0.22
tblVehicleEF	LDT2	0.34	0.01
tblVehicleEF	LDT2	0.13	0.12
tblVehicleEF	LDT2	1.26	0.21
tblVehicleEF	LDT2	0.39	0.79
tblVehicleEF	LDT2	5.2120e-003	4.3000e-003
tblVehicleEF	LDT2	1.0940e-003	1.1000e-003
tblVehicleEF	LDT2	0.48	0.02
tblVehicleEF	LDT2	0.58	0.22
tblVehicleEF	LDT2	0.34	0.01
tblVehicleEF	LDT2	0.16	0.15
tblVehicleEF	LDT2	1.26	0.21
tblVehicleEF	LDT2	0.42	0.84
tblVehicleEF	LHD1	1.1760e-003	1.6000e-003
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	0.17	0.22
tblVehicleEF	LHD1	4.11	1.02
tblVehicleEF	LHD1	7.76	4.01
tblVehicleEF	LHD1	0.10	0.03
tblVehicleEF	LHD1	0.09	0.02
tblVehicleEF	LHD1	2.62	0.99

tblVehicleEF	LHD1	1.29	1.48
tblVehicleEF	LHD1	1.0240e-003	3.0000e-004
tblVehicleEF	LHD1	0.06	0.01
tblVehicleEF	LHD1	9.9260e-003	0.01
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	1.7330e-003	1.1000e-003
tblVehicleEF	LHD1	9.4200e-004	3.0000e-004
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	2.4820e-003	0.01
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	1.5880e-003	1.1000e-003
tblVehicleEF	LHD1	5.0000e-003	6.0000e-004
tblVehicleEF	LHD1	0.14	0.01
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.2100e-003	2.0000e-004
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tblVehicleEF	LHD1	1.17	0.18
tblVehicleEF	LHD1	0.59	0.26
tblVehicleEF	LHD1	9.4000e-005	1.0000e-004
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tblVehicleEF	LHD1	5.0000e-003	6.0000e-004
tblVehicleEF	LHD1	0.14	0.01
tblVehicleEF	LHD1	0.03	0.04
tblVehicleEF	LHD1	2.2100e-003	2.0000e-004
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tblVehicleEF	LHD1	1.17	0.18
tblVehicleEF	LHD1	0.63	0.28

tblVehicleEF	LHD1	1.1760e-003	1.6000e-003
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	0.17	0.22
tblVehicleEF	LHD1	4.22	1.04
tblVehicleEF	LHD1	5.09	2.17
tblVehicleEF	LHD1	0.10	0.03
tblVehicleEF	LHD1	0.09	0.02
tblVehicleEF	LHD1	2.46	0.94
tblVehicleEF	LHD1	1.20	1.34
tblVehicleEF	LHD1	1.0240e-003	3.0000e-004
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tblVehicleEF	LHD1	9.9260e-003	0.01
tblVehicleEF	LHD1	0.03	0.01
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tblVehicleEF	LHD1	0.01	1.9000e-003
tblVehicleEF	LHD1	0.15	0.02
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	3.6790e-003	5.0000e-004
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tblVehicleEF	LHD1	9.4000e-005	1.0000e-004

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tblVehicleEF	LHD1	0.01	1.9000e-003
tblVehicleEF	LHD1	0.15	0.02
tblVehicleEF	LHD1	0.03	0.04
tblVehicleEF	LHD1	3.6790e-003	5.0000e-004
tblVehicleEF	LHD1	0.45	0.13
tblVehicleEF	LHD1	1.14	0.17
tblVehicleEF	LHD1	0.49	0.19
tblVehicleEF	LHD1	1.1760e-003	1.6000e-003
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tblVehicleEF	LHD1	0.03	0.01
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tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	1.7330e-003	1.1000e-003
tblVehicleEF	LHD1	9.4200e-004	3.0000e-004
tblVehicleEF	LHD1	0.02	0.01
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tblVehicleEF	LHD1	0.03	0.01

tblVehicleEF	LHD1	1.5880e-003	1.1000e-003
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tblVehicleEF	LHD1	0.30	0.02
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	6.7900e-003	1.0000e-004
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tblVehicleEF	LHD1	1.32	0.19
tblVehicleEF	LHD1	0.46	0.30
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tblVehicleEF	LHD1	4.1800e-004	5.0000e-004
tblVehicleEF	LHD1	0.02	2.0000e-004
tblVehicleEF	LHD1	0.30	0.02
tblVehicleEF	LHD1	0.03	0.04
tblVehicleEF	LHD1	6.7900e-003	1.0000e-004
tblVehicleEF	LHD1	0.45	0.12
tblVehicleEF	LHD1	1.32	0.19
tblVehicleEF	LHD1	0.49	0.32
tblVehicleEF	LHD2	7.0600e-004	1.4000e-003
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tblVehicleEF	LHD2	3.25	2.02
tblVehicleEF	LHD2	0.45	1.44

tblVehicleEF	LHD2	1.7880e-003	7.0000e-004
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tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.04	0.02
tblVehicleEF	LHD2	5.5700e-004	1.5000e-003
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tblVehicleEF	LHD2	0.03	0.01
tblVehicleEF	LHD2	2.8070e-003	0.01
tblVehicleEF	LHD2	0.04	0.02
tblVehicleEF	LHD2	4.9200e-004	1.5000e-003
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tblVehicleEF	LHD2	0.04	0.05
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	7.5500e-004	4.0000e-004
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tblVehicleEF	LHD2	0.25	0.63
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tblVehicleEF	LHD2	5.9130e-003	7.3000e-003
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tblVehicleEF	LHD2	1.5460e-003	1.9000e-003
tblVehicleEF	LHD2	0.04	0.05
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	7.5500e-004	4.0000e-004
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tblVehicleEF	LHD2	0.25	0.63
tblVehicleEF	LHD2	0.21	0.53
tblVehicleEF	LHD2	7.0600e-004	1.4000e-003

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tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.11	0.19
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tblVehicleEF	LHD2	0.16	0.05
tblVehicleEF	LHD2	3.09	1.91
tblVehicleEF	LHD2	0.42	1.30
tblVehicleEF	LHD2	1.7880e-003	7.0000e-004
tblVehicleEF	LHD2	0.08	0.01
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.04	0.02
tblVehicleEF	LHD2	5.5700e-004	1.5000e-003
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tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	1.2830e-003	1.2000e-003
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tblVehicleEF	LHD2	0.24	0.62
tblVehicleEF	LHD2	0.15	0.33
tblVehicleEF	LHD2	1.0200e-004	1.0000e-004
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tblVehicleEF	LHD2	0.05	0.07
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	1.2830e-003	1.2000e-003
tblVehicleEF	LHD2	0.27	0.35
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tblVehicleEF	LHD2	0.02	0.02
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tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	0.16	0.05
tblVehicleEF	LHD2	3.15	2.08
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tblVehicleEF	LHD2	1.7880e-003	7.0000e-004
tblVehicleEF	LHD2	0.08	0.01
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.04	0.02
tblVehicleEF	LHD2	5.5700e-004	1.5000e-003
tblVehicleEF	LHD2	1.6450e-003	7.0000e-004
tblVehicleEF	LHD2	0.03	0.01
tblVehicleEF	LHD2	2.8070e-003	0.01
tblVehicleEF	LHD2	0.04	0.02
tblVehicleEF	LHD2	4.9200e-004	1.5000e-003

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tblVehicleEF	LHD2	0.02	0.03
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tblVehicleEF	LHD2	0.09	0.06
tblVehicleEF	LHD2	0.02	0.03
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tblVehicleEF	MCY	0.04	6.3000e-003
tblVehicleEF	MCY	8.0000e-003	4.0000e-003
tblVehicleEF	MCY	8.0500e-004	0.02
tblVehicleEF	MCY	2.3350e-003	0.01

tblVehicleEF	MCY	0.02	6.3000e-003
tblVehicleEF	MCY	2.0000e-003	4.0000e-003
tblVehicleEF	MCY	6.4500e-004	0.02
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tblVehicleEF	MCY	0.72	0.23
tblVehicleEF	MCY	3.00	3.04
tblVehicleEF	MCY	1.99	0.34
tblVehicleEF	MCY	2.40	2.62
tblVehicleEF	MCY	2.1750e-003	2.1000e-003
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tblVehicleEF	MCY	1.12	0.64
tblVehicleEF	MCY	0.57	0.28
tblVehicleEF	MCY	0.72	0.23
tblVehicleEF	MCY	3.27	3.31
tblVehicleEF	MCY	1.99	0.34
tblVehicleEF	MCY	2.58	2.82
tblVehicleEF	MCY	0.00	0.21
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tblVehicleEF	MCY	7.3920e-003	0.01
tblVehicleEF	MCY	1.12	1.15
tblVehicleEF	MCY	0.29	0.28
tblVehicleEF	MCY	0.04	6.3000e-003
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tblVehicleEF	MCY	8.0500e-004	0.02

tblVehicleEF	MCY	2.3350e-003	0.01
tblVehicleEF	MCY	0.02	6.3000e-003
tblVehicleEF	MCY	2.0000e-003	4.0000e-003
tblVehicleEF	MCY	6.4500e-004	0.02
tblVehicleEF	MCY	1.8350e-003	0.01
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tblVehicleEF	MCY	1.40	1.21
tblVehicleEF	MCY	2.83	2.81
tblVehicleEF	MCY	1.87	0.33
tblVehicleEF	MCY	1.87	1.83
tblVehicleEF	MCY	2.1340e-003	2.1000e-003
tblVehicleEF	MCY	6.5700e-004	6.0000e-004
tblVehicleEF	MCY	2.49	2.47
tblVehicleEF	MCY	0.75	0.51
tblVehicleEF	MCY	1.40	1.21
tblVehicleEF	MCY	3.09	3.07
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tblVehicleEF	MCY	0.00	0.23
tblVehicleEF	MCY	0.00	0.19
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tblVehicleEF	MCY	7.3920e-003	0.01
tblVehicleEF	MCY	1.17	1.48
tblVehicleEF	MCY	0.29	0.35
tblVehicleEF	MCY	0.04	6.3000e-003
tblVehicleEF	MCY	8.0000e-003	4.0000e-003

tblVehicleEF	MCY	8.0500e-004	0.02
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tblVehicleEF	MCY	0.02	6.3000e-003
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tblVehicleEF	MCY	1.78	0.28
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tblVehicleEF	MDV	10.31	10.27
tblVehicleEF	MDV	0.15	0.08
tblVehicleEF	MDV	0.77	0.65
tblVehicleEF	MDV	0.97	0.93
tblVehicleEF	MDV	0.04	0.01

tblVehicleEF	MDV	3.4880e-003	0.02
tblVehicleEF	MDV	5.1450e-003	0.01
tblVehicleEF	MDV	0.02	0.01
tblVehicleEF	MDV	2.0000e-003	8.0000e-003
tblVehicleEF	MDV	3.1920e-003	0.02
tblVehicleEF	MDV	4.7220e-003	0.01
tblVehicleEF	MDV	0.18	0.09
tblVehicleEF	MDV	0.35	0.21
tblVehicleEF	MDV	0.13	0.05
tblVehicleEF	MDV	0.18	0.14
tblVehicleEF	MDV	1.34	0.18
tblVehicleEF	MDV	0.91	0.85
tblVehicleEF	MDV	6.1930e-003	5.9000e-003
tblVehicleEF	MDV	1.4490e-003	1.4000e-003
tblVehicleEF	MDV	0.18	0.09
tblVehicleEF	MDV	0.35	0.21
tblVehicleEF	MDV	0.13	0.05
tblVehicleEF	MDV	0.23	0.18
tblVehicleEF	MDV	1.34	0.18
tblVehicleEF	MDV	0.97	0.91
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	0.05	0.03
tblVehicleEF	MDV	4.78	4.15
tblVehicleEF	MDV	6.91	6.04
tblVehicleEF	MDV	0.15	0.08
tblVehicleEF	MDV	0.66	0.56
tblVehicleEF	MDV	0.85	0.79
tblVehicleEF	MDV	0.04	0.01

tblVehicleEF	MDV	3.4880e-003	0.02
tblVehicleEF	MDV	5.1450e-003	0.01
tblVehicleEF	MDV	0.02	0.01
tblVehicleEF	MDV	2.0000e-003	8.0000e-003
tblVehicleEF	MDV	3.1920e-003	0.02
tblVehicleEF	MDV	4.7220e-003	0.01
tblVehicleEF	MDV	0.38	0.32
tblVehicleEF	MDV	0.41	0.27
tblVehicleEF	MDV	0.24	0.18
tblVehicleEF	MDV	0.19	0.15
tblVehicleEF	MDV	1.25	0.17
tblVehicleEF	MDV	0.67	0.56
tblVehicleEF	MDV	6.6080e-003	6.7000e-003
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tblVehicleEF	MDV	0.38	0.32
tblVehicleEF	MDV	0.41	0.27
tblVehicleEF	MDV	0.24	0.18
tblVehicleEF	MDV	0.24	0.19
tblVehicleEF	MDV	1.25	0.17
tblVehicleEF	MDV	0.72	0.60
tblVehicleEF	MDV	0.04	0.03
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tblVehicleEF	MDV	4.77	3.69
tblVehicleEF	MDV	7.01	12.44
tblVehicleEF	MDV	0.15	0.08
tblVehicleEF	MDV	0.69	0.72
tblVehicleEF	MDV	0.86	1.01
tblVehicleEF	MDV	0.04	0.01

tblVehicleEF	MDV	3.4880e-003	0.02
tblVehicleEF	MDV	5.1450e-003	0.01
tblVehicleEF	MDV	0.02	0.01
tblVehicleEF	MDV	2.0000e-003	8.0000e-003
tblVehicleEF	MDV	3.1920e-003	0.02
tblVehicleEF	MDV	4.7220e-003	0.01
tblVehicleEF	MDV	0.55	0.01
tblVehicleEF	MDV	0.72	0.21
tblVehicleEF	MDV	0.38	0.01
tblVehicleEF	MDV	0.19	0.14
tblVehicleEF	MDV	1.71	0.21
tblVehicleEF	MDV	0.68	0.99
tblVehicleEF	MDV	6.5810e-003	5.8000e-003
tblVehicleEF	MDV	1.3900e-003	1.4000e-003
tblVehicleEF	MDV	0.55	0.01
tblVehicleEF	MDV	0.72	0.21
tblVehicleEF	MDV	0.38	0.01
tblVehicleEF	MDV	0.24	0.18
tblVehicleEF	MDV	1.71	0.21
tblVehicleEF	MDV	0.72	1.06
tblVehicleEF	MH	0.00	0.07
tblVehicleEF	MH	0.00	0.10
tblVehicleEF	MH	9.74	15.80
tblVehicleEF	MH	17.22	29.19
tblVehicleEF	MH	6.0920e-003	6.5370e-003
tblVehicleEF	MH	2.27	3.29
tblVehicleEF	MH	1.39	1.85
tblVehicleEF	MH	0.05	0.01

tblVehicleEF	MH	8.4670e-003	0.01
tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.5670e-003	1.2000e-003
tblVehicleEF	MH	0.02	0.01
tblVehicleEF	MH	2.1170e-003	0.01
tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.2270e-003	1.2000e-003
tblVehicleEF	MH	2.05	1.94
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.69	0.46
tblVehicleEF	MH	0.35	0.61
tblVehicleEF	MH	3.06	0.04
tblVehicleEF	MH	1.06	1.73
tblVehicleEF	MH	7.5500e-003	7.8000e-003
tblVehicleEF	MH	6.5500e-004	8.0000e-004
tblVehicleEF	MH	2.05	1.94
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.69	0.46
tblVehicleEF	MH	0.40	0.69
tblVehicleEF	MH	3.06	0.04
tblVehicleEF	MH	1.14	1.85
tblVehicleEF	MH	0.00	0.07
tblVehicleEF	MH	0.00	0.06
tblVehicleEF	MH	9.90	16.25
tblVehicleEF	MH	10.76	14.48
tblVehicleEF	MH	6.0920e-003	6.5370e-003
tblVehicleEF	MH	2.04	2.92
tblVehicleEF	MH	1.30	1.68

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tblVehicleEF	MH	8.4670e-003	0.01
tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.5670e-003	1.2000e-003
tblVehicleEF	MH	0.02	0.01
tblVehicleEF	MH	2.1170e-003	0.01
tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.2270e-003	1.2000e-003
tblVehicleEF	MH	4.33	6.30
tblVehicleEF	MH	0.15	0.18
tblVehicleEF	MH	1.00	1.39
tblVehicleEF	MH	0.35	0.63
tblVehicleEF	MH	2.99	0.04
tblVehicleEF	MH	0.75	1.01
tblVehicleEF	MH	7.5520e-003	7.8000e-003
tblVehicleEF	MH	5.4300e-004	6.0000e-004
tblVehicleEF	MH	4.33	6.30
tblVehicleEF	MH	0.15	0.18
tblVehicleEF	MH	1.00	1.39
tblVehicleEF	MH	0.40	0.72
tblVehicleEF	MH	2.99	0.04
tblVehicleEF	MH	0.80	1.08
tblVehicleEF	MH	0.00	0.07
tblVehicleEF	MH	0.00	0.12
tblVehicleEF	MH	9.92	15.79
tblVehicleEF	MH	10.77	35.84
tblVehicleEF	MH	6.0920e-003	6.5370e-003
tblVehicleEF	MH	2.10	3.49

tblVehicleEF	MH	1.30	1.95
tblVehicleEF	MH	0.05	0.01
tblVehicleEF	MH	8.4670e-003	0.01
tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.5670e-003	1.2000e-003
tblVehicleEF	MH	0.02	0.01
tblVehicleEF	MH	2.1170e-003	0.01
tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.2270e-003	1.2000e-003
tblVehicleEF	MH	6.84	0.35
tblVehicleEF	MH	0.29	0.15
tblVehicleEF	MH	2.17	0.16
tblVehicleEF	MH	0.35	0.60
tblVehicleEF	MH	3.30	0.04
tblVehicleEF	MH	0.75	2.07
tblVehicleEF	MH	7.5530e-003	7.8000e-003
tblVehicleEF	MH	5.4300e-004	1.0000e-003
tblVehicleEF	MH	6.84	0.35
tblVehicleEF	MH	0.29	0.15
tblVehicleEF	MH	2.17	0.16
tblVehicleEF	MH	0.40	0.69
tblVehicleEF	MH	3.30	0.04
tblVehicleEF	MH	0.80	2.22
tblVehicleEF	MHD	0.01	1.1000e-003
tblVehicleEF	MHD	9.5610e-003	0.01
tblVehicleEF	MHD	0.00	0.09
tblVehicleEF	MHD	2.40	0.16
tblVehicleEF	MHD	3.00	3.60

tblVehicleEF	MHD	34.03	15.11
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	7.04	0.16
tblVehicleEF	MHD	4.40	3.91
tblVehicleEF	MHD	2.05	0.86
tblVehicleEF	MHD	0.07	2.4000e-003
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tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	0.12	0.14
tblVehicleEF	MHD	9.7780e-003	1.7000e-003
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tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	2.7180e-003	0.01
tblVehicleEF	MHD	0.11	0.14
tblVehicleEF	MHD	7.7670e-003	1.7000e-003
tblVehicleEF	MHD	8.7340e-003	1.6000e-003
tblVehicleEF	MHD	0.40	0.04
tblVehicleEF	MHD	0.29	0.02
tblVehicleEF	MHD	4.2500e-003	4.0000e-004
tblVehicleEF	MHD	0.32	0.23
tblVehicleEF	MHD	1.66	0.43
tblVehicleEF	MHD	3.22	1.49
tblVehicleEF	MHD	5.7810e-003	1.0000e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	1.4330e-003	5.0000e-004
tblVehicleEF	MHD	8.7340e-003	1.6000e-003
tblVehicleEF	MHD	0.40	0.04
tblVehicleEF	MHD	0.33	0.02

tblVehicleEF	MHD	4.2500e-003	4.0000e-004
tblVehicleEF	MHD	0.36	0.26
tblVehicleEF	MHD	1.66	0.43
tblVehicleEF	MHD	3.46	1.61
tblVehicleEF	MHD	0.01	1.1000e-003
tblVehicleEF	MHD	9.5610e-003	0.01
tblVehicleEF	MHD	0.00	0.06
tblVehicleEF	MHD	1.74	0.16
tblVehicleEF	MHD	2.92	3.52
tblVehicleEF	MHD	25.39	9.88
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	7.27	0.16
tblVehicleEF	MHD	4.17	3.72
tblVehicleEF	MHD	1.91	0.78
tblVehicleEF	MHD	0.06	2.4000e-003
tblVehicleEF	MHD	0.10	0.01
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	0.12	0.14
tblVehicleEF	MHD	9.7780e-003	1.7000e-003
tblVehicleEF	MHD	0.06	2.4000e-003
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	2.7180e-003	0.01
tblVehicleEF	MHD	0.11	0.14
tblVehicleEF	MHD	7.7670e-003	1.7000e-003
tblVehicleEF	MHD	0.02	5.3000e-003
tblVehicleEF	MHD	0.45	0.06
tblVehicleEF	MHD	0.28	0.02
tblVehicleEF	MHD	7.3470e-003	1.3000e-003

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tblVehicleEF	MHD	1.2700e-003	4.0000e-004
tblVehicleEF	MHD	0.02	5.3000e-003
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tblVehicleEF	MHD	0.31	0.02
tblVehicleEF	MHD	7.3470e-003	1.3000e-003
tblVehicleEF	MHD	0.36	0.26
tblVehicleEF	MHD	1.62	0.43
tblVehicleEF	MHD	2.52	1.00
tblVehicleEF	MHD	0.01	1.1000e-003
tblVehicleEF	MHD	9.5610e-003	0.01
tblVehicleEF	MHD	0.00	0.11
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tblVehicleEF	MHD	2.93	3.72
tblVehicleEF	MHD	25.46	17.63
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tblVehicleEF	MHD	6.73	0.16
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tblVehicleEF	MHD	1.91	0.91
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tblVehicleEF	MHD	0.10	0.01
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	0.12	0.14
tblVehicleEF	MHD	9.7780e-003	1.7000e-003

tblVehicleEF	MHD	0.08	2.4000e-003
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	2.7180e-003	0.01
tblVehicleEF	MHD	0.11	0.14
tblVehicleEF	MHD	7.7670e-003	1.7000e-003
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tblVehicleEF	MHD	0.02	1.0000e-004
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tblVehicleEF	MHD	5.3060e-003	1.0000e-004
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tblVehicleEF	MHD	1.2710e-003	6.0000e-004
tblVehicleEF	MHD	0.03	3.0000e-004
tblVehicleEF	MHD	0.87	0.05
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tblVehicleEF	MHD	0.02	1.0000e-004
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tblVehicleEF	OBUS	0.02	1.3000e-003
tblVehicleEF	OBUS	2.9480e-003	0.02
tblVehicleEF	OBUS	0.00	0.05
tblVehicleEF	OBUS	2.24	0.18
tblVehicleEF	OBUS	2.13	3.58
tblVehicleEF	OBUS	14.81	15.02

tblVehicleEF	OBUS	3.9530e-003	1.7350e-003
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tblVehicleEF	OBUS	4.62	3.64
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tblVehicleEF	OBUS	0.02	1.3000e-003
tblVehicleEF	OBUS	0.09	0.01
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tblVehicleEF	OBUS	0.06	0.11
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tblVehicleEF	OBUS	0.04	0.01
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tblVehicleEF	OBUS	0.05	0.11
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tblVehicleEF	OBUS	0.46	0.23
tblVehicleEF	OBUS	1.18	0.97
tblVehicleEF	OBUS	5.6380e-003	1.0000e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	6.9500e-004	5.0000e-004
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tblVehicleEF	OBUS	5.9200e-004	2.0000e-004

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tblVehicleEF	OBUS	0.06	0.11
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tblVehicleEF	OBUS	5.1760e-003	1.0000e-004
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tblVehicleEF	SBUS	0.23	0.01
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tblVehicleEF	SBUS	0.08	0.31
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tblVehicleEF	SBUS	2.7010e-003	0.01
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tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	2.2310e-003	5.0000e-004
tblVehicleEF	SBUS	0.23	1.6000e-003
tblVehicleEF	SBUS	0.88	0.08
tblVehicleEF	SBUS	0.14	1.13
tblVehicleEF	SBUS	0.08	8.0000e-004
tblVehicleEF	SBUS	0.86	0.71
tblVehicleEF	SBUS	4.31	0.09
tblVehicleEF	SBUS	3.90	1.19
tblVehicleEF	UBUS	0.00	0.03
tblVehicleEF	UBUS	0.00	0.14
tblVehicleEF	UBUS	6.02	6.17
tblVehicleEF	UBUS	27.32	35.83
tblVehicleEF	UBUS	1.1840e-003	1.5730e-003
tblVehicleEF	UBUS	4.05	4.29
tblVehicleEF	UBUS	3.82	4.52
tblVehicleEF	UBUS	0.54	0.01

tblVehicleEF	UBUS	8.0000e-003	0.01
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	9.5100e-004	7.1000e-003
tblVehicleEF	UBUS	0.23	0.01
tblVehicleEF	UBUS	2.0000e-003	0.01
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	8.8200e-004	7.1000e-003
tblVehicleEF	UBUS	0.01	7.4000e-003
tblVehicleEF	UBUS	0.19	0.14
tblVehicleEF	UBUS	6.4420e-003	3.0000e-003
tblVehicleEF	UBUS	0.45	0.48
tblVehicleEF	UBUS	0.92	0.03
tblVehicleEF	UBUS	2.02	2.54
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	1.0500e-003	1.4000e-003
tblVehicleEF	UBUS	0.01	7.4000e-003
tblVehicleEF	UBUS	0.19	0.14
tblVehicleEF	UBUS	6.4420e-003	3.0000e-003
tblVehicleEF	UBUS	0.51	0.54
tblVehicleEF	UBUS	0.92	0.03
tblVehicleEF	UBUS	2.16	2.71
tblVehicleEF	UBUS	0.00	0.04
tblVehicleEF	UBUS	0.00	0.11
tblVehicleEF	UBUS	6.20	6.45
tblVehicleEF	UBUS	20.27	23.17
tblVehicleEF	UBUS	1.1840e-003	1.5730e-003
tblVehicleEF	UBUS	3.70	3.91
tblVehicleEF	UBUS	3.54	4.04

tblVehicleEF	UBUS	0.54	0.01
tblVehicleEF	UBUS	8.0000e-003	0.01
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	9.5100e-004	7.1000e-003
tblVehicleEF	UBUS	0.23	0.01
tblVehicleEF	UBUS	2.0000e-003	0.01
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	8.8200e-004	7.1000e-003
tblVehicleEF	UBUS	0.03	0.02
tblVehicleEF	UBUS	0.22	0.19
tblVehicleEF	UBUS	0.01	9.5000e-003
tblVehicleEF	UBUS	0.47	0.50
tblVehicleEF	UBUS	0.84	0.02
tblVehicleEF	UBUS	1.71	2.00
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	9.3000e-004	1.2000e-003
tblVehicleEF	UBUS	0.03	0.02
tblVehicleEF	UBUS	0.22	0.19
tblVehicleEF	UBUS	0.01	9.5000e-003
tblVehicleEF	UBUS	0.52	0.56
tblVehicleEF	UBUS	0.84	0.02
tblVehicleEF	UBUS	1.83	2.13
tblVehicleEF	UBUS	0.00	0.03
tblVehicleEF	UBUS	0.00	0.15
tblVehicleEF	UBUS	6.20	6.03
tblVehicleEF	UBUS	20.35	42.00
tblVehicleEF	UBUS	1.1840e-003	1.5730e-003
tblVehicleEF	UBUS	3.80	4.49

tblVehicleEF	UBUS	3.54	4.77
tblVehicleEF	UBUS	0.54	0.01
tblVehicleEF	UBUS	8.0000e-003	0.01
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	9.5100e-004	7.1000e-003
tblVehicleEF	UBUS	0.23	0.01
tblVehicleEF	UBUS	2.0000e-003	0.01
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	8.8200e-004	7.1000e-003
tblVehicleEF	UBUS	0.04	1.8000e-003
tblVehicleEF	UBUS	0.42	0.14
tblVehicleEF	UBUS	0.02	1.2000e-003
tblVehicleEF	UBUS	0.47	0.47
tblVehicleEF	UBUS	1.22	0.03
tblVehicleEF	UBUS	1.72	2.81
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	9.3200e-004	1.5000e-003
tblVehicleEF	UBUS	0.04	1.8000e-003
tblVehicleEF	UBUS	0.42	0.14
tblVehicleEF	UBUS	0.02	1.2000e-003
tblVehicleEF	UBUS	0.52	0.53
tblVehicleEF	UBUS	1.22	0.03
tblVehicleEF	UBUS	1.83	3.00
tblWater	AerobicPercent	87.46	84.69
tblWater	AnaDigestCombDigestGasPercent	100.00	3.17
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	2.14
tblWater	SepticTankPercent	10.33	10.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2014	3.4765	39.9321	20.9941	0.0379	30.8480	1.7140	32.5620	3.7853	1.5769	5.3622			3,645.9269	1.0736	0.0000	3,668.4720
Total	**3.4765**	**39.9321**	**20.9941**	**0.0379**	**30.8480**	**1.7140**	**32.5620**	**3.7853**	**1.5769**	**5.3622**			**3,645.9269**	**1.0736**	**0.0000**	**3,668.4720**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2014	3.4765	39.9320	20.9941	0.0379	17.9212	1.7140	19.6352	1.8345	1.5769	3.4114			3,645.9226	1.0736	0.0000	3,668.4677
Total	**3.4765**	**39.9320**	**20.9941**	**0.0379**	**17.9212**	**1.7140**	**19.6352**	**1.8345**	**1.5769**	**3.4114**			**3,645.9226**	**1.0736**	**0.0000**	**3,668.4677**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**41.90**	**0.00**	**39.70**	**51.54**	**0.00**	**36.38**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000			2.0000e-005	0.0000	0.0000	2.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**			**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000			2.0000e-005	0.0000	0.0000	2.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**			**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.3 Vegetation

Vegetation

	CO2e
Category	MT
Vegetation Land Change	836.1400
Total	**836.1400**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site preparation	Site Preparation	2/1/2014	2/7/2014	5	5	
2	Distribute straw bales on sand dunes	Site Preparation	2/8/2014	8/8/2014	5	130	
3	Planting and watering	Site Preparation	8/9/2014	11/28/2014	5	80	
4	Clean up and restoration	Site Preparation	11/29/2014	12/12/2014	5	10	

Acres of Grading (Site Preparation Phase): 5.6

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site preparation	Graders	2	8.00	162	0.61
Site preparation	Off-Highway Trucks	4	8.00	381	0.57
Site preparation	Rubber Tired Dozers	0	8.00	358	0.59
Site preparation	Tractors/Loaders/Backhoes	0	8.00	75	0.55
Distribute straw bales on sand dunes	Cranes	0	7.00	208	0.43
Distribute straw bales on sand dunes	Forklifts	0	8.00	149	0.30
Distribute straw bales on sand dunes	Generator Sets	0	8.00	84	0.74
Distribute straw bales on sand dunes	Off-Highway Trucks	6	8.00	381	0.57
Distribute straw bales on sand dunes	Rubber Tired Dozers	2	8.00	358	0.59
Distribute straw bales on sand dunes	Rubber Tired Loaders	2	8.00	87	0.54
Distribute straw bales on sand dunes	Tractors/Loaders/Backhoes	2	8.00	75	0.55
Distribute straw bales on sand dunes	Welders	0	8.00	46	0.45
Planting and watering	Cranes	0	7.00	208	0.43
Planting and watering	Forklifts	0	8.00	149	0.30
Planting and watering	Generator Sets	0	8.00	84	0.74
Planting and watering	Off-Highway Trucks	30	8.00	381	0.57
Planting and watering	Rubber Tired Dozers	3	8.00	358	0.59
Planting and watering	Rubber Tired Loaders	2	8.00	87	0.54
Planting and watering	Tractors/Loaders/Backhoes	5	8.00	75	0.55
Planting and watering	Welders	0	8.00	46	0.45
Clean up and restoration	Off-Highway Trucks	7	8.00	381	0.57
Clean up and restoration	Rubber Tired Dozers	2	8.00	358	0.59
Clean up and restoration	Rubber Tired Loaders	2	8.00	87	0.54
Clean up and restoration	Tractors/Loaders/Backhoes	2	8.00	75	0.55

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site preparation	6	10.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Distribute straw bales on sand dunes	12	10.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Planting and watering	40	20.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Clean up and restoration	13	10.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Site preparation - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.9700e-003	0.0000	2.9700e-003	3.2000e-004	0.0000	3.2000e-004			0.0000	0.0000	0.0000	0.0000
Off-Road	0.0225	0.2553	0.1139	2.3000e-004		0.0111	0.0111		0.0102	0.0102			22.2781	6.5800e-003	0.0000	22.4164
Total	**0.0225**	**0.2553**	**0.1139**	**2.3000e-004**	**2.9700e-003**	**0.0111**	**0.0141**	**3.2000e-004**	**0.0102**	**0.0106**			**22.2781**	**6.5800e-003**	**0.0000**	**22.4164**

3.2 Site preparation - 2014

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-004	4.4000e-004	4.4000e-003	0.0000	0.4766	0.0000	0.4766	0.0476	0.0000	0.0476			0.3085	3.0000e-005	0.0000	0.3091
Total	**3.0000e-004**	**4.4000e-004**	**4.4000e-003**	**0.0000**	**0.4766**	**0.0000**	**0.4766**	**0.0476**	**0.0000**	**0.0476**			**0.3085**	**3.0000e-005**	**0.0000**	**0.3091**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.0000e-004	0.0000	2.0000e-004	2.0000e-005	0.0000	2.0000e-005			0.0000	0.0000	0.0000	0.0000
Off-Road	0.0225	0.2553	0.1139	2.3000e-004		0.0111	0.0111		0.0102	0.0102			22.2781	6.5800e-003	0.0000	22.4164
Total	**0.0225**	**0.2553**	**0.1139**	**2.3000e-004**	**2.0000e-004**	**0.0111**	**0.0113**	**2.0000e-005**	**0.0102**	**0.0103**			**22.2781**	**6.5800e-003**	**0.0000**	**22.4164**

3.2 Site preparation - 2014

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-004	4.4000e-004	4.4000e-003	0.0000	0.2918	0.0000	0.2918	0.0291	0.0000	0.0291			0.3085	3.0000e-005	0.0000	0.3091
Total	**3.0000e-004**	**4.4000e-004**	**4.4000e-003**	**0.0000**	**0.2918**	**0.0000**	**0.2918**	**0.0291**	**0.0000**	**0.0291**			**0.3085**	**3.0000e-005**	**0.0000**	**0.3091**

3.3 Distribute straw bales on sand dunes - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.8857	0.0000	0.8857	0.4414	0.0000	0.4414			0.0000	0.0000	0.0000	0.0000
Off-Road	1.0788	12.1978	6.9070	0.0107		0.5583	0.5583		0.5136	0.5136			1,031.3280	0.3048	0.0000	1,037.7281
Total	**1.0788**	**12.1978**	**6.9070**	**0.0107**	**0.8857**	**0.5583**	**1.4440**	**0.4414**	**0.5136**	**0.9551**			**1,031.3280**	**0.3048**	**0.0000**	**1,037.7281**

3.3 Distribute straw bales on sand dunes - 2014

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	7.7000e-003	0.0115	0.1144	1.0000e-004	12.3907	1.1000e-004	12.3909	1.2368	1.0000e-004	1.2369			8.0198	7.4000e-004	0.0000	8.0353
Total	**7.7000e-003**	**0.0115**	**0.1144**	**1.0000e-004**	**12.3907**	**1.1000e-004**	**12.3909**	**1.2368**	**1.0000e-004**	**1.2369**			**8.0198**	**7.4000e-004**	**0.0000**	**8.0353**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0598	0.0000	0.0598	0.0298	0.0000	0.0298			0.0000	0.0000	0.0000	0.0000
Off-Road	1.0788	12.1978	6.9070	0.0107		0.5583	0.5583		0.5136	0.5136			1,031.3268	0.3048	0.0000	1,037.7269
Total	**1.0788**	**12.1978**	**6.9070**	**0.0107**	**0.0598**	**0.5583**	**0.6181**	**0.0298**	**0.5136**	**0.5434**			**1,031.3268**	**0.3048**	**0.0000**	**1,037.7269**

3.3 Distribute straw bales on sand dunes - 2014

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	7.7000e-003	0.0115	0.1144	1.0000e-004	7.5874	1.1000e-004	7.5875	0.7565	1.0000e-004	0.7566			8.0198	7.4000e-004	0.0000	8.0353
Total	**7.7000e-003**	**0.0115**	**0.1144**	**1.0000e-004**	**7.5874**	**1.1000e-004**	**7.5875**	**0.7565**	**1.0000e-004**	**0.7566**			**8.0198**	**7.4000e-004**	**0.0000**	**8.0353**

3.4 Planting and watering - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.8255	0.0000	0.8255	0.4083	0.0000	0.4083			0.0000	0.0000	0.0000	0.0000
Off-Road	2.2667	26.4239	13.1337	0.0258		1.0980	1.0980		1.0101	1.0101			2,485.1195	0.7344	0.0000	2,500.5415
Total	**2.2667**	**26.4239**	**13.1337**	**0.0258**	**0.8255**	**1.0980**	**1.9235**	**0.4083**	**1.0101**	**1.4185**			**2,485.1195**	**0.7344**	**0.0000**	**2,500.5415**

3.4 Planting and watering - 2014

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	9.4800e-003	0.0142	0.1408	1.2000e-004	15.2501	1.4000e-004	15.2503	1.5222	1.2000e-004	1.5224			9.8705	9.1000e-004	0.0000	9.8896
Total	**9.4800e-003**	**0.0142**	**0.1408**	**1.2000e-004**	**15.2501**	**1.4000e-004**	**15.2503**	**1.5222**	**1.2000e-004**	**1.5224**			**9.8705**	**9.1000e-004**	**0.0000**	**9.8896**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0557	0.0000	0.0557	0.0276	0.0000	0.0276			0.0000	0.0000	0.0000	0.0000
Off-Road	2.2667	26.4239	13.1337	0.0258		1.0980	1.0980		1.0101	1.0101			2,485.1166	0.7344	0.0000	2,500.5385
Total	**2.2667**	**26.4239**	**13.1337**	**0.0258**	**0.0557**	**1.0980**	**1.1537**	**0.0276**	**1.0101**	**1.0377**			**2,485.1166**	**0.7344**	**0.0000**	**2,500.5385**

3.4 Planting and watering - 2014

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	9.4800e-003	0.0142	0.1408	1.2000e-004	9.3383	1.4000e-004	9.3385	0.9311	1.2000e-004	0.9312			9.8705	9.1000e-004	0.0000	9.8896
Total	**9.4800e-003**	**0.0142**	**0.1408**	**1.2000e-004**	**9.3383**	**1.4000e-004**	**9.3385**	**0.9311**	**1.2000e-004**	**0.9312**			**9.8705**	**9.1000e-004**	**0.0000**	**9.8896**

3.5 Clean up and restoration - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0632	0.0000	0.0632	0.0334	0.0000	0.0334			0.0000	0.0000	0.0000	0.0000
Off-Road	0.0905	1.0280	0.5711	9.2000e-004		0.0464	0.0464		0.0427	0.0427			88.3856	0.0261	0.0000	88.9341
Total	**0.0905**	**1.0280**	**0.5711**	**9.2000e-004**	**0.0632**	**0.0464**	**0.1096**	**0.0334**	**0.0427**	**0.0761**			**88.3856**	**0.0261**	**0.0000**	**88.9341**

3.5 Clean up and restoration - 2014

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	5.9000e-004	8.9000e-004	8.8000e-003	1.0000e-005	0.9531	1.0000e-005	0.9531	0.0951	1.0000e-005	0.0952			0.6169	6.0000e-005	0.0000	0.6181
Total	**5.9000e-004**	**8.9000e-004**	**8.8000e-003**	**1.0000e-005**	**0.9531**	**1.0000e-005**	**0.9531**	**0.0951**	**1.0000e-005**	**0.0952**			**0.6169**	**6.0000e-005**	**0.0000**	**0.6181**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.2700e-003	0.0000	4.2700e-003	2.2600e-003	0.0000	2.2600e-003			0.0000	0.0000	0.0000	0.0000
Off-Road	0.0905	1.0280	0.5711	9.2000e-004		0.0464	0.0464		0.0427	0.0427			88.3855	0.0261	0.0000	88.9340
Total	**0.0905**	**1.0280**	**0.5711**	**9.2000e-004**	**4.2700e-003**	**0.0464**	**0.0507**	**2.2600e-003**	**0.0427**	**0.0449**			**88.3855**	**0.0261**	**0.0000**	**88.9340**

3.5 Clean up and restoration - 2014

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	5.9000e-004	8.9000e-004	8.8000e-003	1.0000e-005	0.5837	1.0000e-005	0.5837	0.0582	1.0000e-005	0.0582			0.6169	6.0000e-005	0.0000	0.6181
Total	**5.9000e-004**	**8.9000e-004**	**8.8000e-003**	**1.0000e-005**	**0.5837**	**1.0000e-005**	**0.5837**	**0.0582**	**1.0000e-005**	**0.0582**			**0.6169**	**6.0000e-005**	**0.0000**	**0.6181**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Recreational	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Recreational	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.298929	0.238852	0.201373	0.075588	0.027827	0.015800	0.016059	0.098716	0.001735	0.001573	0.014785	0.002226	0.006537

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**			**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**			**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000			2.0000e-005	0.0000	0.0000	2.0000e-005
Unmitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000			2.0000e-005	0.0000	0.0000	2.0000e-005

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000			2.0000e-005	0.0000	0.0000	2.0000e-005
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**			**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000			2.0000e-005	0.0000	0.0000	2.0000e-005
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**			**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Recreational	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Recreational	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

Category	Total CO2	CH4	N2O	CO2e
	MT			
Unmitigated	836.1400	0.0000	0.0000	836.1400

10.1 Vegetation Land Change

Vegetation Type

	Initial/Final	Total CO2	CH4	N2O	CO2e
	Acres	MT			
Grassland	0 / 194	836.1400	0.0000	0.0000	836.1400
Total		**836.1400**	**0.0000**	**0.0000**	**836.1400**

Keeler Dunes

Inyo County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Recreational	1.00	User Defined Unit	194.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.8	**Precipitation Freq (Days)**	34
Climate Zone	9			**Operational Year**	2015
Utility Company	Statewide Average				
CO2 Intensity (lb/MWhr)	958.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.011

1.3 User Entered Comments & Non-Default Data

Project Characteristics - The average wind speed, as recorded at the Bishop Airport Monitoring Station from 1992 to 2002, was approximately 8.4 miles per hour, which is 3.8 m/s.

Land Use - The proposed project site is 194 acres

Construction Phase - User-defined scenario

Off-road Equipment - user-defined

Off-road Equipment - User-defined scenario

Off-road Equipment - User-defined scenario

Off-road Equipment - User-defined scenario

Off-road Equipment - User-defined scenario

Trips and VMT - User-defined scenario

On-road Fugitive Dust - Assumed 95 percent of travel on unpaved roads

Vehicle Trips - User-defined scenario

Energy Use - User-defined scenario

Construction Off-road Equipment Mitigation - Vehicle speeds limited to 15 mph. Exposed areas watered two times per day.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	120.00	5.00
tblConstructionPhase	NumDays	120.00	130.00
tblConstructionPhase	NumDays	120.00	80.00
tblConstructionPhase	NumDays	120.00	10.00
tblGrading	AcresOfGrading	5.00	5.60
tblGrading	AcresOfGrading	0.00	194.00
tblGrading	AcresOfGrading	0.00	194.00
tblGrading	AcresOfGrading	0.00	5.60
tblLandUse	LotAcreage	0.00	194.00
tblOffRoadEquipment	HorsePower	255.00	358.00
tblOffRoadEquipment	HorsePower	255.00	358.00
tblOffRoadEquipment	HorsePower	255.00	358.00
tblOffRoadEquipment	HorsePower	255.00	358.00

tblOffRoadEquipment	HorsePower	97.00	75.00
tblOffRoadEquipment	HorsePower	97.00	75.00
tblOffRoadEquipment	HorsePower	97.00	75.00
tblOffRoadEquipment	HorsePower	97.00	75.00
tblOffRoadEquipment	HorsePower	226.00	208.00
tblOffRoadEquipment	HorsePower	226.00	208.00
tblOffRoadEquipment	HorsePower	89.00	149.00
tblOffRoadEquipment	HorsePower	89.00	149.00
tblOffRoadEquipment	HorsePower	174.00	162.00
tblOffRoadEquipment	HorsePower	400.00	381.00
tblOffRoadEquipment	HorsePower	400.00	381.00
tblOffRoadEquipment	HorsePower	400.00	381.00
tblOffRoadEquipment	HorsePower	400.00	381.00
tblOffRoadEquipment	HorsePower	199.00	87.00
tblOffRoadEquipment	HorsePower	199.00	87.00
tblOffRoadEquipment	HorsePower	199.00	87.00
tblOffRoadEquipment	LoadFactor	0.40	0.59
tblOffRoadEquipment	LoadFactor	0.40	0.59
tblOffRoadEquipment	LoadFactor	0.40	0.59
tblOffRoadEquipment	LoadFactor	0.40	0.59
tblOffRoadEquipment	LoadFactor	0.37	0.55
tblOffRoadEquipment	LoadFactor	0.37	0.55
tblOffRoadEquipment	LoadFactor	0.37	0.55
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tblOffRoadEquipment	LoadFactor	0.29	0.43
tblOffRoadEquipment	LoadFactor	0.29	0.43
tblOffRoadEquipment	LoadFactor	0.20	0.30
tblOffRoadEquipment	LoadFactor	0.20	0.30

tblOffRoadEquipment	LoadFactor	0.41	0.61
tblOffRoadEquipment	LoadFactor	0.38	0.57
tblOffRoadEquipment	LoadFactor	0.38	0.57
tblOffRoadEquipment	LoadFactor	0.38	0.57
tblOffRoadEquipment	LoadFactor	0.38	0.57
tblOffRoadEquipment	LoadFactor	0.36	0.54
tblOffRoadEquipment	LoadFactor	0.36	0.54
tblOffRoadEquipment	LoadFactor	0.36	0.54
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	6.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	30.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	7.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	PhaseName		Distribute straw bales on sand dunes
tblOffRoadEquipment	PhaseName		Planting and watering
tblOffRoadEquipment	PhaseName		Distribute straw bales on sand dunes
tblOffRoadEquipment	PhaseName		Planting and watering
tblOffRoadEquipment	PhaseName		Distribute straw bales on sand dunes
tblOffRoadEquipment	PhaseName		Planting and watering
tblOffRoadEquipment	PhaseName		Distribute straw bales on sand dunes

tblOffRoadEquipment	PhaseName		Planting and watering
tblOffRoadEquipment	PhaseName		Clean up and restoration
tblOffRoadEquipment	PhaseName		Distribute straw bales on sand dunes
tblOffRoadEquipment	PhaseName		Planting and watering
tblOffRoadEquipment	PhaseName		Clean up and restoration
tblOffRoadEquipment	PhaseName		Distribute straw bales on sand dunes
tblOffRoadEquipment	PhaseName		Planting and watering
tblOnRoadDust	WorkerPercentPave	100.00	15.00
tblOnRoadDust	WorkerPercentPave	100.00	15.00
tblOnRoadDust	WorkerPercentPave	100.00	15.00
tblOnRoadDust	WorkerPercentPave	100.00	15.00
tblProjectCharacteristics	CO2IntensityFactor	1001.57	958.49
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.011
tblProjectCharacteristics	OperationalYear	2014	2015
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblProjectCharacteristics	WindSpeed	2.2	3.8
tblTripsAndVMT	WorkerTripNumber	15.00	10.00
tblTripsAndVMT	WorkerTripNumber	30.00	10.00
tblTripsAndVMT	WorkerTripNumber	100.00	20.00
tblTripsAndVMT	WorkerTripNumber	33.00	10.00
tblVehicleEF	HHD	0.03	0.13
tblVehicleEF	HHD	0.01	0.03
tblVehicleEF	HHD	0.00	0.13
tblVehicleEF	HHD	2.92	13.51
tblVehicleEF	HHD	2.05	3.74
tblVehicleEF	HHD	110.77	29.69
tblVehicleEF	HHD	0.10	0.10
tblVehicleEF	HHD	5.14	30.54

tblVehicleEF	HHD	6.03	10.13
tblVehicleEF	HHD	5.22	1.44
tblVehicleEF	HHD	0.02	0.34
tblVehicleEF	HHD	0.06	0.02
tblVehicleEF	HHD	0.04	0.03
tblVehicleEF	HHD	0.11	0.37
tblVehicleEF	HHD	0.01	1.2000e-003
tblVehicleEF	HHD	0.02	0.34
tblVehicleEF	HHD	0.03	0.02
tblVehicleEF	HHD	8.7890e-003	0.03
tblVehicleEF	HHD	0.10	0.37
tblVehicleEF	HHD	8.2710e-003	1.2000e-003
tblVehicleEF	HHD	8.5750e-003	8.0000e-004
tblVehicleEF	HHD	0.43	0.03
tblVehicleEF	HHD	0.54	2.86
tblVehicleEF	HHD	4.4350e-003	2.0000e-004
tblVehicleEF	HHD	0.29	0.76
tblVehicleEF	HHD	1.78	0.02
tblVehicleEF	HHD	5.78	2.01
tblVehicleEF	HHD	5.5950e-003	0.01
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	2.7680e-003	7.0000e-004
tblVehicleEF	HHD	8.5750e-003	8.0000e-004
tblVehicleEF	HHD	0.43	0.03
tblVehicleEF	HHD	0.62	3.26
tblVehicleEF	HHD	4.4350e-003	2.0000e-004
tblVehicleEF	HHD	0.33	0.86
tblVehicleEF	HHD	1.78	0.02

tblVehicleEF	HHD	6.22	2.17
tblVehicleEF	HHD	0.02	0.12
tblVehicleEF	HHD	0.01	0.03
tblVehicleEF	HHD	0.00	0.08
tblVehicleEF	HHD	2.12	8.85
tblVehicleEF	HHD	2.05	3.72
tblVehicleEF	HHD	85.04	22.29
tblVehicleEF	HHD	0.10	0.10
tblVehicleEF	HHD	5.30	32.08
tblVehicleEF	HHD	5.74	9.76
tblVehicleEF	HHD	4.86	1.30
tblVehicleEF	HHD	0.02	0.27
tblVehicleEF	HHD	0.06	0.02
tblVehicleEF	HHD	0.04	0.03
tblVehicleEF	HHD	0.11	0.37
tblVehicleEF	HHD	0.01	1.2000e-003
tblVehicleEF	HHD	0.02	0.27
tblVehicleEF	HHD	0.03	0.02
tblVehicleEF	HHD	8.7890e-003	0.03
tblVehicleEF	HHD	0.10	0.37
tblVehicleEF	HHD	8.2710e-003	1.2000e-003
tblVehicleEF	HHD	0.02	2.9000e-003
tblVehicleEF	HHD	0.49	0.03
tblVehicleEF	HHD	0.51	2.62
tblVehicleEF	HHD	7.7500e-003	8.0000e-004
tblVehicleEF	HHD	0.29	0.76
tblVehicleEF	HHD	1.76	0.02
tblVehicleEF	HHD	4.16	1.26

tblVehicleEF	HHD	5.9280e-003	0.01
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	2.3130e-003	5.0000e-004
tblVehicleEF	HHD	0.02	2.9000e-003
tblVehicleEF	HHD	0.49	0.03
tblVehicleEF	HHD	0.58	2.99
tblVehicleEF	HHD	7.7500e-003	8.0000e-004
tblVehicleEF	HHD	0.33	0.86
tblVehicleEF	HHD	1.76	0.02
tblVehicleEF	HHD	4.48	1.36
tblVehicleEF	HHD	0.03	0.14
tblVehicleEF	HHD	0.01	0.03
tblVehicleEF	HHD	0.00	0.15
tblVehicleEF	HHD	4.03	16.83
tblVehicleEF	HHD	2.06	3.76
tblVehicleEF	HHD	85.27	33.46
tblVehicleEF	HHD	0.10	0.10
tblVehicleEF	HHD	4.91	29.45
tblVehicleEF	HHD	5.85	10.35
tblVehicleEF	HHD	4.86	1.52
tblVehicleEF	HHD	0.03	0.39
tblVehicleEF	HHD	0.06	0.02
tblVehicleEF	HHD	0.04	0.03
tblVehicleEF	HHD	0.11	0.37
tblVehicleEF	HHD	0.01	1.2000e-003
tblVehicleEF	HHD	0.02	0.39
tblVehicleEF	HHD	0.03	0.02
tblVehicleEF	HHD	8.7890e-003	0.03

tblVehicleEF	HHD	0.10	0.37
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tblVehicleEF	HHD	0.02	1.0000e-004
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tblVehicleEF	HHD	4.17	2.40
tblVehicleEF	HHD	5.1360e-003	0.01
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	2.3170e-003	7.0000e-004
tblVehicleEF	HHD	0.03	1.0000e-004
tblVehicleEF	HHD	0.94	0.03
tblVehicleEF	HHD	0.66	3.45
tblVehicleEF	HHD	0.02	1.0000e-004
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tblVehicleEF	HHD	2.01	0.02
tblVehicleEF	HHD	4.49	2.58
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	0.02	0.03
tblVehicleEF	LDA	2.00	2.16
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tblVehicleEF	LDA	0.31	0.30
tblVehicleEF	LDA	0.21	0.26
tblVehicleEF	LDA	0.28	0.38
tblVehicleEF	LDA	0.04	0.01
tblVehicleEF	LDA	2.7110e-003	0.01

tblVehicleEF	LDA	3.9660e-003	7.0000e-003
tblVehicleEF	LDA	0.02	0.01
tblVehicleEF	LDA	2.0000e-003	8.0000e-003
tblVehicleEF	LDA	2.4660e-003	0.01
tblVehicleEF	LDA	3.6060e-003	7.0000e-003
tblVehicleEF	LDA	0.11	0.09
tblVehicleEF	LDA	0.23	0.21
tblVehicleEF	LDA	0.09	0.04
tblVehicleEF	LDA	0.08	0.08
tblVehicleEF	LDA	0.54	0.09
tblVehicleEF	LDA	0.36	0.52
tblVehicleEF	LDA	3.5900e-003	3.5000e-003
tblVehicleEF	LDA	8.1600e-004	8.0000e-004
tblVehicleEF	LDA	0.11	0.09
tblVehicleEF	LDA	0.23	0.21
tblVehicleEF	LDA	0.09	0.04
tblVehicleEF	LDA	0.10	0.10
tblVehicleEF	LDA	0.54	0.09
tblVehicleEF	LDA	0.39	0.56
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	0.02	0.01
tblVehicleEF	LDA	2.20	2.53
tblVehicleEF	LDA	2.96	3.93
tblVehicleEF	LDA	0.31	0.30
tblVehicleEF	LDA	0.18	0.22
tblVehicleEF	LDA	0.25	0.32
tblVehicleEF	LDA	0.04	0.01
tblVehicleEF	LDA	2.7110e-003	0.01

tblVehicleEF	LDA	3.9660e-003	7.0000e-003
tblVehicleEF	LDA	0.02	0.01
tblVehicleEF	LDA	2.0000e-003	8.0000e-003
tblVehicleEF	LDA	2.4660e-003	0.01
tblVehicleEF	LDA	3.6060e-003	7.0000e-003
tblVehicleEF	LDA	0.24	0.33
tblVehicleEF	LDA	0.27	0.28
tblVehicleEF	LDA	0.15	0.17
tblVehicleEF	LDA	0.08	0.09
tblVehicleEF	LDA	0.52	0.09
tblVehicleEF	LDA	0.27	0.34
tblVehicleEF	LDA	3.8450e-003	3.9000e-003
tblVehicleEF	LDA	7.9100e-004	8.0000e-004
tblVehicleEF	LDA	0.24	0.33
tblVehicleEF	LDA	0.27	0.28
tblVehicleEF	LDA	0.15	0.17
tblVehicleEF	LDA	0.10	0.11
tblVehicleEF	LDA	0.52	0.09
tblVehicleEF	LDA	0.28	0.37
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	0.02	0.03
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tblVehicleEF	LDA	2.7110e-003	0.01

tblVehicleEF	LDA	3.9660e-003	7.0000e-003
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tblVehicleEF	LDT1	0.12	0.24
tblVehicleEF	LDT1	0.71	0.99
tblVehicleEF	LDT1	0.52	0.67
tblVehicleEF	LDT1	0.04	0.01
tblVehicleEF	LDT1	6.7850e-003	0.01

tblVehicleEF	LDT1	8.8680e-003	0.01
tblVehicleEF	LDT1	0.02	0.01
tblVehicleEF	LDT1	2.0000e-003	8.0000e-003
tblVehicleEF	LDT1	6.0870e-003	0.01
tblVehicleEF	LDT1	7.9660e-003	0.01
tblVehicleEF	LDT1	0.33	0.23
tblVehicleEF	LDT1	0.54	0.44
tblVehicleEF	LDT1	0.24	0.11
tblVehicleEF	LDT1	0.30	0.33
tblVehicleEF	LDT1	1.82	0.38
tblVehicleEF	LDT1	0.92	1.17
tblVehicleEF	LDT1	4.2510e-003	4.3000e-003
tblVehicleEF	LDT1	1.0880e-003	1.1000e-003
tblVehicleEF	LDT1	0.33	0.23
tblVehicleEF	LDT1	0.54	0.44
tblVehicleEF	LDT1	0.24	0.11
tblVehicleEF	LDT1	0.35	0.38
tblVehicleEF	LDT1	1.82	0.38
tblVehicleEF	LDT1	0.99	1.25
tblVehicleEF	LDT1	0.04	0.05
tblVehicleEF	LDT1	0.05	0.04
tblVehicleEF	LDT1	7.77	8.71
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tblVehicleEF	LDT1	0.02	0.01
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tblVehicleEF	LDT1	0.63	0.59
tblVehicleEF	LDT1	0.43	0.43
tblVehicleEF	LDT1	0.30	0.34
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tblVehicleEF	LDT1	4.5200e-003	4.8000e-003
tblVehicleEF	LDT1	1.0190e-003	1.0000e-003
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tblVehicleEF	LDT1	0.63	0.59
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tblVehicleEF	LDT1	0.35	0.39
tblVehicleEF	LDT1	1.70	0.36
tblVehicleEF	LDT1	0.71	0.80
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tblVehicleEF	LDT1	0.12	0.24
tblVehicleEF	LDT1	0.63	1.09
tblVehicleEF	LDT1	0.46	0.73
tblVehicleEF	LDT1	0.04	0.01
tblVehicleEF	LDT1	6.7850e-003	0.01

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tblVehicleEF	LDT1	0.68	1.38
tblVehicleEF	LDT1	4.5030e-003	4.3000e-003
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tblVehicleEF	LDT2	0.03	0.03
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tblVehicleEF	LDT2	6.72	9.01
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tblVehicleEF	LDT2	0.58	0.73
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tblVehicleEF	LDT2	3.0560e-003	0.02

tblVehicleEF	LDT2	4.3330e-003	0.01
tblVehicleEF	LDT2	0.02	0.01
tblVehicleEF	LDT2	2.0000e-003	8.0000e-003
tblVehicleEF	LDT2	2.7600e-003	0.02
tblVehicleEF	LDT2	3.9230e-003	0.01
tblVehicleEF	LDT2	0.15	0.10
tblVehicleEF	LDT2	0.28	0.21
tblVehicleEF	LDT2	0.11	0.05
tblVehicleEF	LDT2	0.13	0.12
tblVehicleEF	LDT2	0.99	0.18
tblVehicleEF	LDT2	0.52	0.67
tblVehicleEF	LDT2	4.9000e-003	4.3000e-003
tblVehicleEF	LDT2	1.1320e-003	1.0000e-003
tblVehicleEF	LDT2	0.15	0.10
tblVehicleEF	LDT2	0.28	0.21
tblVehicleEF	LDT2	0.11	0.05
tblVehicleEF	LDT2	0.16	0.15
tblVehicleEF	LDT2	0.99	0.18
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tblVehicleEF	LDT2	0.03	0.03
tblVehicleEF	LDT2	0.03	0.02
tblVehicleEF	LDT2	3.59	3.76
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tblVehicleEF	LDT2	0.18	0.20
tblVehicleEF	LDT2	0.38	0.46
tblVehicleEF	LDT2	0.51	0.62
tblVehicleEF	LDT2	0.04	0.01
tblVehicleEF	LDT2	3.0560e-003	0.02

tblVehicleEF	LDT2	4.3330e-003	0.01
tblVehicleEF	LDT2	0.02	0.01
tblVehicleEF	LDT2	2.0000e-003	8.0000e-003
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tblVehicleEF	LDT2	3.9230e-003	0.01
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tblVehicleEF	LDT2	0.32	0.29
tblVehicleEF	LDT2	0.20	0.19
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tblVehicleEF	LDT2	0.93	0.17
tblVehicleEF	LDT2	0.39	0.44
tblVehicleEF	LDT2	5.2330e-003	4.9000e-003
tblVehicleEF	LDT2	1.0930e-003	1.0000e-003
tblVehicleEF	LDT2	0.32	0.36
tblVehicleEF	LDT2	0.32	0.29
tblVehicleEF	LDT2	0.20	0.19
tblVehicleEF	LDT2	0.16	0.16
tblVehicleEF	LDT2	0.93	0.17
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tblVehicleEF	LDT2	0.03	0.04
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tblVehicleEF	LDT2	3.0560e-003	0.02

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tblVehicleEF	LDT2	2.0000e-003	8.0000e-003
tblVehicleEF	LDT2	2.7600e-003	0.02
tblVehicleEF	LDT2	3.9230e-003	0.01
tblVehicleEF	LDT2	0.48	0.02
tblVehicleEF	LDT2	0.58	0.22
tblVehicleEF	LDT2	0.34	0.01
tblVehicleEF	LDT2	0.13	0.12
tblVehicleEF	LDT2	1.26	0.21
tblVehicleEF	LDT2	0.39	0.79
tblVehicleEF	LDT2	5.2120e-003	4.3000e-003
tblVehicleEF	LDT2	1.0940e-003	1.1000e-003
tblVehicleEF	LDT2	0.48	0.02
tblVehicleEF	LDT2	0.58	0.22
tblVehicleEF	LDT2	0.34	0.01
tblVehicleEF	LDT2	0.16	0.15
tblVehicleEF	LDT2	1.26	0.21
tblVehicleEF	LDT2	0.42	0.84
tblVehicleEF	LHD1	1.1760e-003	1.6000e-003
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	0.17	0.22
tblVehicleEF	LHD1	4.11	1.02
tblVehicleEF	LHD1	7.76	4.01
tblVehicleEF	LHD1	0.10	0.03
tblVehicleEF	LHD1	0.09	0.02
tblVehicleEF	LHD1	2.62	0.99

tblVehicleEF	LHD1	1.29	1.48
tblVehicleEF	LHD1	1.0240e-003	3.0000e-004
tblVehicleEF	LHD1	0.06	0.01
tblVehicleEF	LHD1	9.9260e-003	0.01
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	1.7330e-003	1.1000e-003
tblVehicleEF	LHD1	9.4200e-004	3.0000e-004
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tblVehicleEF	LHD1	2.4820e-003	0.01
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	1.5880e-003	1.1000e-003
tblVehicleEF	LHD1	5.0000e-003	6.0000e-004
tblVehicleEF	LHD1	0.14	0.01
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.2100e-003	2.0000e-004
tblVehicleEF	LHD1	0.39	0.10
tblVehicleEF	LHD1	1.17	0.18
tblVehicleEF	LHD1	0.59	0.26
tblVehicleEF	LHD1	9.4000e-005	1.0000e-004
tblVehicleEF	LHD1	7.4900e-003	8.2000e-003
tblVehicleEF	LHD1	4.6400e-004	4.0000e-004
tblVehicleEF	LHD1	5.0000e-003	6.0000e-004
tblVehicleEF	LHD1	0.14	0.01
tblVehicleEF	LHD1	0.03	0.04
tblVehicleEF	LHD1	2.2100e-003	2.0000e-004
tblVehicleEF	LHD1	0.44	0.12
tblVehicleEF	LHD1	1.17	0.18
tblVehicleEF	LHD1	0.63	0.28

tblVehicleEF	LHD1	1.1760e-003	1.6000e-003
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	0.17	0.22
tblVehicleEF	LHD1	4.22	1.04
tblVehicleEF	LHD1	5.09	2.17
tblVehicleEF	LHD1	0.10	0.03
tblVehicleEF	LHD1	0.09	0.02
tblVehicleEF	LHD1	2.46	0.94
tblVehicleEF	LHD1	1.20	1.34
tblVehicleEF	LHD1	1.0240e-003	3.0000e-004
tblVehicleEF	LHD1	0.06	0.01
tblVehicleEF	LHD1	9.9260e-003	0.01
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	1.7330e-003	1.1000e-003
tblVehicleEF	LHD1	9.4200e-004	3.0000e-004
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	2.4820e-003	0.01
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	1.5880e-003	1.1000e-003
tblVehicleEF	LHD1	0.01	1.9000e-003
tblVehicleEF	LHD1	0.15	0.02
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	3.6790e-003	5.0000e-004
tblVehicleEF	LHD1	0.40	0.11
tblVehicleEF	LHD1	1.14	0.17
tblVehicleEF	LHD1	0.46	0.18
tblVehicleEF	LHD1	9.4000e-005	1.0000e-004

tblVehicleEF	LHD1	7.4930e-003	8.2000e-003
tblVehicleEF	LHD1	4.1800e-004	4.0000e-004
tblVehicleEF	LHD1	0.01	1.9000e-003
tblVehicleEF	LHD1	0.15	0.02
tblVehicleEF	LHD1	0.03	0.04
tblVehicleEF	LHD1	3.6790e-003	5.0000e-004
tblVehicleEF	LHD1	0.45	0.13
tblVehicleEF	LHD1	1.14	0.17
tblVehicleEF	LHD1	0.49	0.19
tblVehicleEF	LHD1	1.1760e-003	1.6000e-003
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	0.17	0.22
tblVehicleEF	LHD1	4.22	1.02
tblVehicleEF	LHD1	5.09	4.88
tblVehicleEF	LHD1	0.10	0.03
tblVehicleEF	LHD1	0.09	0.02
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tblVehicleEF	LHD1	1.20	1.55
tblVehicleEF	LHD1	1.0240e-003	3.0000e-004
tblVehicleEF	LHD1	0.06	0.01
tblVehicleEF	LHD1	9.9260e-003	0.01
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	1.7330e-003	1.1000e-003
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tblVehicleEF	LHD1	2.4820e-003	0.01
tblVehicleEF	LHD1	0.03	0.01

tblVehicleEF	LHD1	1.5880e-003	1.1000e-003
tblVehicleEF	LHD1	0.02	2.0000e-004
tblVehicleEF	LHD1	0.30	0.02
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	6.7900e-003	1.0000e-004
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tblVehicleEF	LHD1	1.32	0.19
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tblVehicleEF	LHD1	9.4000e-005	1.0000e-004
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tblVehicleEF	LHD1	4.1800e-004	5.0000e-004
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tblVehicleEF	LHD1	0.30	0.02
tblVehicleEF	LHD1	0.03	0.04
tblVehicleEF	LHD1	6.7900e-003	1.0000e-004
tblVehicleEF	LHD1	0.45	0.12
tblVehicleEF	LHD1	1.32	0.19
tblVehicleEF	LHD1	0.49	0.32
tblVehicleEF	LHD2	7.0600e-004	1.4000e-003
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	0.11	0.19
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tblVehicleEF	LHD2	2.56	7.84
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	0.16	0.05
tblVehicleEF	LHD2	3.25	2.02
tblVehicleEF	LHD2	0.45	1.44

tblVehicleEF	LHD2	1.7880e-003	7.0000e-004
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tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.04	0.02
tblVehicleEF	LHD2	5.5700e-004	1.5000e-003
tblVehicleEF	LHD2	1.6450e-003	7.0000e-004
tblVehicleEF	LHD2	0.03	0.01
tblVehicleEF	LHD2	2.8070e-003	0.01
tblVehicleEF	LHD2	0.04	0.02
tblVehicleEF	LHD2	4.9200e-004	1.5000e-003
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tblVehicleEF	LHD2	0.04	0.05
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	7.5500e-004	4.0000e-004
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tblVehicleEF	LHD2	0.25	0.63
tblVehicleEF	LHD2	0.20	0.50
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tblVehicleEF	LHD2	1.5460e-003	1.9000e-003
tblVehicleEF	LHD2	0.04	0.05
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	7.5500e-004	4.0000e-004
tblVehicleEF	LHD2	0.27	0.33
tblVehicleEF	LHD2	0.25	0.63
tblVehicleEF	LHD2	0.21	0.53
tblVehicleEF	LHD2	7.0600e-004	1.4000e-003

tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.11	0.19
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tblVehicleEF	LHD2	0.01	0.02
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tblVehicleEF	LHD2	1.7880e-003	7.0000e-004
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tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.04	0.02
tblVehicleEF	LHD2	5.5700e-004	1.5000e-003
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tblVehicleEF	LHD2	2.8070e-003	0.01
tblVehicleEF	LHD2	0.04	0.02
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tblVehicleEF	LHD2	0.05	0.07
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	1.2830e-003	1.2000e-003
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tblVehicleEF	LHD2	0.15	0.33
tblVehicleEF	LHD2	1.0200e-004	1.0000e-004
tblVehicleEF	LHD2	5.9130e-003	7.3000e-003

tblVehicleEF	LHD2	1.6200e-004	4.0000e-004
tblVehicleEF	LHD2	3.2640e-003	6.1000e-003
tblVehicleEF	LHD2	0.05	0.07
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	1.2830e-003	1.2000e-003
tblVehicleEF	LHD2	0.27	0.35
tblVehicleEF	LHD2	0.24	0.62
tblVehicleEF	LHD2	0.16	0.36
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tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	0.01	0.03
tblVehicleEF	LHD2	0.11	0.19
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tblVehicleEF	LHD2	1.63	9.57
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	0.16	0.05
tblVehicleEF	LHD2	3.15	2.08
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tblVehicleEF	LHD2	1.7880e-003	7.0000e-004
tblVehicleEF	LHD2	0.08	0.01
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.04	0.02
tblVehicleEF	LHD2	5.5700e-004	1.5000e-003
tblVehicleEF	LHD2	1.6450e-003	7.0000e-004
tblVehicleEF	LHD2	0.03	0.01
tblVehicleEF	LHD2	2.8070e-003	0.01
tblVehicleEF	LHD2	0.04	0.02
tblVehicleEF	LHD2	4.9200e-004	1.5000e-003

tblVehicleEF	LHD2	5.1450e-003	4.0000e-004
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tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	2.4490e-003	1.0000e-004
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tblVehicleEF	LHD2	0.28	0.68
tblVehicleEF	LHD2	0.15	0.58
tblVehicleEF	LHD2	1.0200e-004	1.0000e-004
tblVehicleEF	LHD2	5.9130e-003	7.3000e-003
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tblVehicleEF	LHD2	5.1450e-003	4.0000e-004
tblVehicleEF	LHD2	0.09	0.06
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	2.4490e-003	1.0000e-004
tblVehicleEF	LHD2	0.27	0.33
tblVehicleEF	LHD2	0.28	0.68
tblVehicleEF	LHD2	0.16	0.62
tblVehicleEF	MCY	0.00	0.22
tblVehicleEF	MCY	0.00	0.16
tblVehicleEF	MCY	32.11	32.39
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tblVehicleEF	MCY	7.3920e-003	0.01
tblVehicleEF	MCY	1.31	1.37
tblVehicleEF	MCY	0.32	0.32
tblVehicleEF	MCY	0.04	6.3000e-003
tblVehicleEF	MCY	8.0000e-003	4.0000e-003
tblVehicleEF	MCY	8.0500e-004	0.02
tblVehicleEF	MCY	2.3350e-003	0.01

tblVehicleEF	MCY	0.02	6.3000e-003
tblVehicleEF	MCY	2.0000e-003	4.0000e-003
tblVehicleEF	MCY	6.4500e-004	0.02
tblVehicleEF	MCY	1.8350e-003	0.01
tblVehicleEF	MCY	1.12	0.64
tblVehicleEF	MCY	0.57	0.28
tblVehicleEF	MCY	0.72	0.23
tblVehicleEF	MCY	3.00	3.04
tblVehicleEF	MCY	1.99	0.34
tblVehicleEF	MCY	2.40	2.62
tblVehicleEF	MCY	2.1750e-003	2.1000e-003
tblVehicleEF	MCY	7.0800e-004	7.0000e-004
tblVehicleEF	MCY	1.12	0.64
tblVehicleEF	MCY	0.57	0.28
tblVehicleEF	MCY	0.72	0.23
tblVehicleEF	MCY	3.27	3.31
tblVehicleEF	MCY	1.99	0.34
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tblVehicleEF	MCY	0.00	0.21
tblVehicleEF	MCY	0.00	0.11
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tblVehicleEF	MCY	7.3920e-003	0.01
tblVehicleEF	MCY	1.12	1.15
tblVehicleEF	MCY	0.29	0.28
tblVehicleEF	MCY	0.04	6.3000e-003
tblVehicleEF	MCY	8.0000e-003	4.0000e-003
tblVehicleEF	MCY	8.0500e-004	0.02

tblVehicleEF	MCY	2.3350e-003	0.01
tblVehicleEF	MCY	0.02	6.3000e-003
tblVehicleEF	MCY	2.0000e-003	4.0000e-003
tblVehicleEF	MCY	6.4500e-004	0.02
tblVehicleEF	MCY	1.8350e-003	0.01
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tblVehicleEF	MCY	0.75	0.51
tblVehicleEF	MCY	1.40	1.21
tblVehicleEF	MCY	2.83	2.81
tblVehicleEF	MCY	1.87	0.33
tblVehicleEF	MCY	1.87	1.83
tblVehicleEF	MCY	2.1340e-003	2.1000e-003
tblVehicleEF	MCY	6.5700e-004	6.0000e-004
tblVehicleEF	MCY	2.49	2.47
tblVehicleEF	MCY	0.75	0.51
tblVehicleEF	MCY	1.40	1.21
tblVehicleEF	MCY	3.09	3.07
tblVehicleEF	MCY	1.87	0.33
tblVehicleEF	MCY	2.01	1.97
tblVehicleEF	MCY	0.00	0.23
tblVehicleEF	MCY	0.00	0.19
tblVehicleEF	MCY	30.06	35.29
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tblVehicleEF	MCY	7.3920e-003	0.01
tblVehicleEF	MCY	1.17	1.48
tblVehicleEF	MCY	0.29	0.35
tblVehicleEF	MCY	0.04	6.3000e-003
tblVehicleEF	MCY	8.0000e-003	4.0000e-003

tblVehicleEF	MCY	8.0500e-004	0.02
tblVehicleEF	MCY	2.3350e-003	0.01
tblVehicleEF	MCY	0.02	6.3000e-003
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tblVehicleEF	MCY	6.4500e-004	0.02
tblVehicleEF	MCY	1.8350e-003	0.01
tblVehicleEF	MCY	4.38	0.05
tblVehicleEF	MCY	1.78	0.28
tblVehicleEF	MCY	2.91	0.02
tblVehicleEF	MCY	2.84	3.19
tblVehicleEF	MCY	2.45	0.40
tblVehicleEF	MCY	1.88	3.04
tblVehicleEF	MCY	2.1380e-003	2.2000e-003
tblVehicleEF	MCY	6.5800e-004	7.0000e-004
tblVehicleEF	MCY	4.38	0.05
tblVehicleEF	MCY	1.78	0.28
tblVehicleEF	MCY	2.91	0.02
tblVehicleEF	MCY	3.10	3.47
tblVehicleEF	MCY	2.45	0.40
tblVehicleEF	MCY	2.02	3.26
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tblVehicleEF	MDV	0.05	0.04
tblVehicleEF	MDV	4.37	3.65
tblVehicleEF	MDV	10.31	10.27
tblVehicleEF	MDV	0.15	0.08
tblVehicleEF	MDV	0.77	0.65
tblVehicleEF	MDV	0.97	0.93
tblVehicleEF	MDV	0.04	0.01

tblVehicleEF	MDV	3.4880e-003	0.02
tblVehicleEF	MDV	5.1450e-003	0.01
tblVehicleEF	MDV	0.02	0.01
tblVehicleEF	MDV	2.0000e-003	8.0000e-003
tblVehicleEF	MDV	3.1920e-003	0.02
tblVehicleEF	MDV	4.7220e-003	0.01
tblVehicleEF	MDV	0.18	0.09
tblVehicleEF	MDV	0.35	0.21
tblVehicleEF	MDV	0.13	0.05
tblVehicleEF	MDV	0.18	0.14
tblVehicleEF	MDV	1.34	0.18
tblVehicleEF	MDV	0.91	0.85
tblVehicleEF	MDV	6.1930e-003	5.9000e-003
tblVehicleEF	MDV	1.4490e-003	1.4000e-003
tblVehicleEF	MDV	0.18	0.09
tblVehicleEF	MDV	0.35	0.21
tblVehicleEF	MDV	0.13	0.05
tblVehicleEF	MDV	0.23	0.18
tblVehicleEF	MDV	1.34	0.18
tblVehicleEF	MDV	0.97	0.91
tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	0.05	0.03
tblVehicleEF	MDV	4.78	4.15
tblVehicleEF	MDV	6.91	6.04
tblVehicleEF	MDV	0.15	0.08
tblVehicleEF	MDV	0.66	0.56
tblVehicleEF	MDV	0.85	0.79
tblVehicleEF	MDV	0.04	0.01

tblVehicleEF	MDV	3.4880e-003	0.02
tblVehicleEF	MDV	5.1450e-003	0.01
tblVehicleEF	MDV	0.02	0.01
tblVehicleEF	MDV	2.0000e-003	8.0000e-003
tblVehicleEF	MDV	3.1920e-003	0.02
tblVehicleEF	MDV	4.7220e-003	0.01
tblVehicleEF	MDV	0.38	0.32
tblVehicleEF	MDV	0.41	0.27
tblVehicleEF	MDV	0.24	0.18
tblVehicleEF	MDV	0.19	0.15
tblVehicleEF	MDV	1.25	0.17
tblVehicleEF	MDV	0.67	0.56
tblVehicleEF	MDV	6.6080e-003	6.7000e-003
tblVehicleEF	MDV	1.3880e-003	1.3000e-003
tblVehicleEF	MDV	0.38	0.32
tblVehicleEF	MDV	0.41	0.27
tblVehicleEF	MDV	0.24	0.18
tblVehicleEF	MDV	0.24	0.19
tblVehicleEF	MDV	1.25	0.17
tblVehicleEF	MDV	0.72	0.60
tblVehicleEF	MDV	0.04	0.03
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tblVehicleEF	MDV	4.77	3.69
tblVehicleEF	MDV	7.01	12.44
tblVehicleEF	MDV	0.15	0.08
tblVehicleEF	MDV	0.69	0.72
tblVehicleEF	MDV	0.86	1.01
tblVehicleEF	MDV	0.04	0.01

tblVehicleEF	MDV	3.4880e-003	0.02
tblVehicleEF	MDV	5.1450e-003	0.01
tblVehicleEF	MDV	0.02	0.01
tblVehicleEF	MDV	2.0000e-003	8.0000e-003
tblVehicleEF	MDV	3.1920e-003	0.02
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tblVehicleEF	MDV	0.72	0.21
tblVehicleEF	MDV	0.38	0.01
tblVehicleEF	MDV	0.19	0.14
tblVehicleEF	MDV	1.71	0.21
tblVehicleEF	MDV	0.68	0.99
tblVehicleEF	MDV	6.5810e-003	5.8000e-003
tblVehicleEF	MDV	1.3900e-003	1.4000e-003
tblVehicleEF	MDV	0.55	0.01
tblVehicleEF	MDV	0.72	0.21
tblVehicleEF	MDV	0.38	0.01
tblVehicleEF	MDV	0.24	0.18
tblVehicleEF	MDV	1.71	0.21
tblVehicleEF	MDV	0.72	1.06
tblVehicleEF	MH	0.00	0.07
tblVehicleEF	MH	0.00	0.10
tblVehicleEF	MH	9.74	15.80
tblVehicleEF	MH	17.22	29.19
tblVehicleEF	MH	6.0920e-003	6.5370e-003
tblVehicleEF	MH	2.27	3.29
tblVehicleEF	MH	1.39	1.85
tblVehicleEF	MH	0.05	0.01

tblVehicleEF	MH	8.4670e-003	0.01
tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.5670e-003	1.2000e-003
tblVehicleEF	MH	0.02	0.01
tblVehicleEF	MH	2.1170e-003	0.01
tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.2270e-003	1.2000e-003
tblVehicleEF	MH	2.05	1.94
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.69	0.46
tblVehicleEF	MH	0.35	0.61
tblVehicleEF	MH	3.06	0.04
tblVehicleEF	MH	1.06	1.73
tblVehicleEF	MH	7.5500e-003	7.8000e-003
tblVehicleEF	MH	6.5500e-004	8.0000e-004
tblVehicleEF	MH	2.05	1.94
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.69	0.46
tblVehicleEF	MH	0.40	0.69
tblVehicleEF	MH	3.06	0.04
tblVehicleEF	MH	1.14	1.85
tblVehicleEF	MH	0.00	0.07
tblVehicleEF	MH	0.00	0.06
tblVehicleEF	MH	9.90	16.25
tblVehicleEF	MH	10.76	14.48
tblVehicleEF	MH	6.0920e-003	6.5370e-003
tblVehicleEF	MH	2.04	2.92
tblVehicleEF	MH	1.30	1.68

tblVehicleEF	MH	0.05	0.01
tblVehicleEF	MH	8.4670e-003	0.01
tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.5670e-003	1.2000e-003
tblVehicleEF	MH	0.02	0.01
tblVehicleEF	MH	2.1170e-003	0.01
tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.2270e-003	1.2000e-003
tblVehicleEF	MH	4.33	6.30
tblVehicleEF	MH	0.15	0.18
tblVehicleEF	MH	1.00	1.39
tblVehicleEF	MH	0.35	0.63
tblVehicleEF	MH	2.99	0.04
tblVehicleEF	MH	0.75	1.01
tblVehicleEF	MH	7.5520e-003	7.8000e-003
tblVehicleEF	MH	5.4300e-004	6.0000e-004
tblVehicleEF	MH	4.33	6.30
tblVehicleEF	MH	0.15	0.18
tblVehicleEF	MH	1.00	1.39
tblVehicleEF	MH	0.40	0.72
tblVehicleEF	MH	2.99	0.04
tblVehicleEF	MH	0.80	1.08
tblVehicleEF	MH	0.00	0.07
tblVehicleEF	MH	0.00	0.12
tblVehicleEF	MH	9.92	15.79
tblVehicleEF	MH	10.77	35.84
tblVehicleEF	MH	6.0920e-003	6.5370e-003
tblVehicleEF	MH	2.10	3.49

tblVehicleEF	MH	1.30	1.95
tblVehicleEF	MH	0.05	0.01
tblVehicleEF	MH	8.4670e-003	0.01
tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.5670e-003	1.2000e-003
tblVehicleEF	MH	0.02	0.01
tblVehicleEF	MH	2.1170e-003	0.01
tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.2270e-003	1.2000e-003
tblVehicleEF	MH	6.84	0.35
tblVehicleEF	MH	0.29	0.15
tblVehicleEF	MH	2.17	0.16
tblVehicleEF	MH	0.35	0.60
tblVehicleEF	MH	3.30	0.04
tblVehicleEF	MH	0.75	2.07
tblVehicleEF	MH	7.5530e-003	7.8000e-003
tblVehicleEF	MH	5.4300e-004	1.0000e-003
tblVehicleEF	MH	6.84	0.35
tblVehicleEF	MH	0.29	0.15
tblVehicleEF	MH	2.17	0.16
tblVehicleEF	MH	0.40	0.69
tblVehicleEF	MH	3.30	0.04
tblVehicleEF	MH	0.80	2.22
tblVehicleEF	MHD	0.01	1.1000e-003
tblVehicleEF	MHD	9.5610e-003	0.01
tblVehicleEF	MHD	0.00	0.09
tblVehicleEF	MHD	2.40	0.16
tblVehicleEF	MHD	3.00	3.60

tblVehicleEF	MHD	34.03	15.11
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tblVehicleEF	MHD	7.04	0.16
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tblVehicleEF	MHD	2.05	0.86
tblVehicleEF	MHD	0.07	2.4000e-003
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tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	0.12	0.14
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tblVehicleEF	MHD	2.7180e-003	0.01
tblVehicleEF	MHD	0.11	0.14
tblVehicleEF	MHD	7.7670e-003	1.7000e-003
tblVehicleEF	MHD	8.7340e-003	1.6000e-003
tblVehicleEF	MHD	0.40	0.04
tblVehicleEF	MHD	0.29	0.02
tblVehicleEF	MHD	4.2500e-003	4.0000e-004
tblVehicleEF	MHD	0.32	0.23
tblVehicleEF	MHD	1.66	0.43
tblVehicleEF	MHD	3.22	1.49
tblVehicleEF	MHD	5.7810e-003	1.0000e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	1.4330e-003	5.0000e-004
tblVehicleEF	MHD	8.7340e-003	1.6000e-003
tblVehicleEF	MHD	0.40	0.04
tblVehicleEF	MHD	0.33	0.02

tblVehicleEF	MHD	4.2500e-003	4.0000e-004
tblVehicleEF	MHD	0.36	0.26
tblVehicleEF	MHD	1.66	0.43
tblVehicleEF	MHD	3.46	1.61
tblVehicleEF	MHD	0.01	1.1000e-003
tblVehicleEF	MHD	9.5610e-003	0.01
tblVehicleEF	MHD	0.00	0.06
tblVehicleEF	MHD	1.74	0.16
tblVehicleEF	MHD	2.92	3.52
tblVehicleEF	MHD	25.39	9.88
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	7.27	0.16
tblVehicleEF	MHD	4.17	3.72
tblVehicleEF	MHD	1.91	0.78
tblVehicleEF	MHD	0.06	2.4000e-003
tblVehicleEF	MHD	0.10	0.01
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	0.12	0.14
tblVehicleEF	MHD	9.7780e-003	1.7000e-003
tblVehicleEF	MHD	0.06	2.4000e-003
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	2.7180e-003	0.01
tblVehicleEF	MHD	0.11	0.14
tblVehicleEF	MHD	7.7670e-003	1.7000e-003
tblVehicleEF	MHD	0.02	5.3000e-003
tblVehicleEF	MHD	0.45	0.06
tblVehicleEF	MHD	0.28	0.02
tblVehicleEF	MHD	7.3470e-003	1.3000e-003

tblVehicleEF	MHD	0.32	0.23
tblVehicleEF	MHD	1.62	0.43
tblVehicleEF	MHD	2.34	0.93
tblVehicleEF	MHD	6.1240e-003	1.0000e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	1.2700e-003	4.0000e-004
tblVehicleEF	MHD	0.02	5.3000e-003
tblVehicleEF	MHD	0.45	0.06
tblVehicleEF	MHD	0.31	0.02
tblVehicleEF	MHD	7.3470e-003	1.3000e-003
tblVehicleEF	MHD	0.36	0.26
tblVehicleEF	MHD	1.62	0.43
tblVehicleEF	MHD	2.52	1.00
tblVehicleEF	MHD	0.01	1.1000e-003
tblVehicleEF	MHD	9.5610e-003	0.01
tblVehicleEF	MHD	0.00	0.11
tblVehicleEF	MHD	3.30	0.16
tblVehicleEF	MHD	2.93	3.72
tblVehicleEF	MHD	25.46	17.63
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	6.73	0.16
tblVehicleEF	MHD	4.25	4.01
tblVehicleEF	MHD	1.91	0.91
tblVehicleEF	MHD	0.09	2.4000e-003
tblVehicleEF	MHD	0.10	0.01
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	0.12	0.14
tblVehicleEF	MHD	9.7780e-003	1.7000e-003

tblVehicleEF	MHD	0.08	2.4000e-003
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	2.7180e-003	0.01
tblVehicleEF	MHD	0.11	0.14
tblVehicleEF	MHD	7.7670e-003	1.7000e-003
tblVehicleEF	MHD	0.03	3.0000e-004
tblVehicleEF	MHD	0.87	0.05
tblVehicleEF	MHD	0.32	0.02
tblVehicleEF	MHD	0.02	1.0000e-004
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tblVehicleEF	MHD	5.3060e-003	1.0000e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	1.2710e-003	6.0000e-004
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tblVehicleEF	MHD	0.36	0.02
tblVehicleEF	MHD	0.02	1.0000e-004
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tblVehicleEF	MHD	1.87	0.45
tblVehicleEF	MHD	2.52	1.92
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tblVehicleEF	OBUS	2.9480e-003	0.02
tblVehicleEF	OBUS	0.00	0.05
tblVehicleEF	OBUS	2.24	0.18
tblVehicleEF	OBUS	2.13	3.58
tblVehicleEF	OBUS	14.81	15.02

tblVehicleEF	OBUS	3.9530e-003	1.7350e-003
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tblVehicleEF	OBUS	4.62	3.64
tblVehicleEF	OBUS	1.77	1.81
tblVehicleEF	OBUS	0.02	1.3000e-003
tblVehicleEF	OBUS	0.09	0.01
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	0.06	0.11
tblVehicleEF	OBUS	2.3860e-003	2.3000e-003
tblVehicleEF	OBUS	0.02	1.3000e-003
tblVehicleEF	OBUS	0.04	0.01
tblVehicleEF	OBUS	2.5450e-003	0.01
tblVehicleEF	OBUS	0.05	0.11
tblVehicleEF	OBUS	1.8930e-003	2.3000e-003
tblVehicleEF	OBUS	1.4710e-003	6.0000e-004
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tblVehicleEF	OBUS	0.21	0.23
tblVehicleEF	OBUS	0.46	0.23
tblVehicleEF	OBUS	1.18	0.97
tblVehicleEF	OBUS	5.6380e-003	1.0000e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	6.9500e-004	5.0000e-004
tblVehicleEF	OBUS	1.4710e-003	6.0000e-004
tblVehicleEF	OBUS	0.04	0.02
tblVehicleEF	OBUS	0.45	0.03
tblVehicleEF	OBUS	5.9200e-004	2.0000e-004

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tblVehicleEF	OBUS	0.46	0.23
tblVehicleEF	OBUS	1.27	1.03
tblVehicleEF	OBUS	0.02	1.3000e-003
tblVehicleEF	OBUS	2.9480e-003	0.02
tblVehicleEF	OBUS	0.00	0.04
tblVehicleEF	OBUS	1.63	0.18
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tblVehicleEF	OBUS	10.93	9.17
tblVehicleEF	OBUS	3.9530e-003	1.7350e-003
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tblVehicleEF	OBUS	0.02	1.3000e-003
tblVehicleEF	OBUS	0.09	0.01
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	0.06	0.11
tblVehicleEF	OBUS	2.3860e-003	2.3000e-003
tblVehicleEF	OBUS	0.02	1.3000e-003
tblVehicleEF	OBUS	0.04	0.01
tblVehicleEF	OBUS	2.5450e-003	0.01
tblVehicleEF	OBUS	0.05	0.11
tblVehicleEF	OBUS	1.8930e-003	2.3000e-003
tblVehicleEF	OBUS	3.1470e-003	2.0000e-003
tblVehicleEF	OBUS	0.05	0.02
tblVehicleEF	OBUS	0.37	0.03
tblVehicleEF	OBUS	8.9000e-004	6.0000e-004
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tblVehicleEF	OBUS	0.91	0.69
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tblVehicleEF	OBUS	0.06	0.11
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tblVehicleEF	OBUS	0.92	1.11
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tblVehicleEF	SBUS	7.1220e-003	0.04
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tblVehicleEF	SBUS	59.28	13.08
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tblVehicleEF	SBUS	3.94	0.88
tblVehicleEF	SBUS	0.03	0.11
tblVehicleEF	SBUS	0.53	0.01
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tblVehicleEF	SBUS	0.03	0.11
tblVehicleEF	SBUS	0.23	0.01
tblVehicleEF	SBUS	2.7010e-003	0.01
tblVehicleEF	SBUS	0.08	0.31
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tblVehicleEF	SBUS	4.55	0.97
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tblVehicleEF	SBUS	3.14	0.07

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tblVehicleEF	SBUS	0.03	0.11
tblVehicleEF	SBUS	0.23	0.01

tblVehicleEF	SBUS	2.7010e-003	0.01
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tblVehicleEF	SBUS	0.14	1.13
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tblVehicleEF	UBUS	6.02	6.17
tblVehicleEF	UBUS	27.32	35.83
tblVehicleEF	UBUS	1.1840e-003	1.5730e-003
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tblVehicleEF	UBUS	3.82	4.52
tblVehicleEF	UBUS	0.54	0.01

tblVehicleEF	UBUS	8.0000e-003	0.01
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	9.5100e-004	7.1000e-003
tblVehicleEF	UBUS	0.23	0.01
tblVehicleEF	UBUS	2.0000e-003	0.01
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	8.8200e-004	7.1000e-003
tblVehicleEF	UBUS	0.01	7.4000e-003
tblVehicleEF	UBUS	0.19	0.14
tblVehicleEF	UBUS	6.4420e-003	3.0000e-003
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tblVehicleEF	UBUS	0.92	0.03
tblVehicleEF	UBUS	2.02	2.54
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	1.0500e-003	1.4000e-003
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tblVehicleEF	UBUS	2.16	2.71
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tblVehicleEF	UBUS	6.20	6.45
tblVehicleEF	UBUS	20.27	23.17
tblVehicleEF	UBUS	1.1840e-003	1.5730e-003
tblVehicleEF	UBUS	3.70	3.91
tblVehicleEF	UBUS	3.54	4.04

tblVehicleEF	UBUS	0.54	0.01
tblVehicleEF	UBUS	8.0000e-003	0.01
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	9.5100e-004	7.1000e-003
tblVehicleEF	UBUS	0.23	0.01
tblVehicleEF	UBUS	2.0000e-003	0.01
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	8.8200e-004	7.1000e-003
tblVehicleEF	UBUS	0.03	0.02
tblVehicleEF	UBUS	0.22	0.19
tblVehicleEF	UBUS	0.01	9.5000e-003
tblVehicleEF	UBUS	0.47	0.50
tblVehicleEF	UBUS	0.84	0.02
tblVehicleEF	UBUS	1.71	2.00
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	9.3000e-004	1.2000e-003
tblVehicleEF	UBUS	0.03	0.02
tblVehicleEF	UBUS	0.22	0.19
tblVehicleEF	UBUS	0.01	9.5000e-003
tblVehicleEF	UBUS	0.52	0.56
tblVehicleEF	UBUS	0.84	0.02
tblVehicleEF	UBUS	1.83	2.13
tblVehicleEF	UBUS	0.00	0.03
tblVehicleEF	UBUS	0.00	0.15
tblVehicleEF	UBUS	6.20	6.03
tblVehicleEF	UBUS	20.35	42.00
tblVehicleEF	UBUS	1.1840e-003	1.5730e-003
tblVehicleEF	UBUS	3.80	4.49

tblVehicleEF	UBUS	3.54	4.77
tblVehicleEF	UBUS	0.54	0.01
tblVehicleEF	UBUS	8.0000e-003	0.01
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	9.5100e-004	7.1000e-003
tblVehicleEF	UBUS	0.23	0.01
tblVehicleEF	UBUS	2.0000e-003	0.01
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	8.8200e-004	7.1000e-003
tblVehicleEF	UBUS	0.04	1.8000e-003
tblVehicleEF	UBUS	0.42	0.14
tblVehicleEF	UBUS	0.02	1.2000e-003
tblVehicleEF	UBUS	0.47	0.47
tblVehicleEF	UBUS	1.22	0.03
tblVehicleEF	UBUS	1.72	2.81
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	9.3200e-004	1.5000e-003
tblVehicleEF	UBUS	0.04	1.8000e-003
tblVehicleEF	UBUS	0.42	0.14
tblVehicleEF	UBUS	0.02	1.2000e-003
tblVehicleEF	UBUS	0.52	0.53
tblVehicleEF	UBUS	1.22	0.03
tblVehicleEF	UBUS	1.83	3.00
tblWater	AerobicPercent	87.46	84.69
tblWater	AnaDigestCombDigestGasPercent	100.00	3.17
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	2.14
tblWater	SepticTankPercent	10.33	10.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2014	56.9126	660.9021	331.9614	0.6490	441.0474	27.4528	468.5002	52.1715	25.2565	77.4280			68,774.3978	20.2629	0.0000	69,199.9179
Total	**56.9126**	**660.9021**	**331.9614**	**0.6490**	**441.0474**	**27.4528**	**468.5002**	**52.1715**	**25.2565**	**77.4280**			**68,774.3978**	**20.2629**	**0.0000**	**69,199.9179**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2014	56.9126	660.9021	331.9614	0.6490	258.8262	27.4528	286.2790	26.3546	25.2565	51.6111			68,774.3978	20.2629	0.0000	69,199.9179
Total	**56.9126**	**660.9021**	**331.9614**	**0.6490**	**258.8262**	**27.4528**	**286.2790**	**26.3546**	**25.2565**	**51.6111**			**68,774.3978**	**20.2629**	**0.0000**	**69,199.9179**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	41.32	0.00	38.89	49.48	0.00	33.34	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000			2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Total	**1.0000e-005**	**0.0000**	**1.1000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**			**2.2000e-004**	**0.0000**	**0.0000**	**2.3000e-004**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000			2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Total	**1.0000e-005**	**0.0000**	**1.1000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**			**2.2000e-004**	**0.0000**	**0.0000**	**2.3000e-004**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site preparation	Site Preparation	2/1/2014	2/7/2014	5	5	
2	Distribute straw bales on sand dunes	Site Preparation	2/8/2014	8/8/2014	5	130	
3	Planting and watering	Site Preparation	8/9/2014	11/28/2014	5	80	
4	Clean up and restoration	Site Preparation	11/29/2014	12/12/2014	5	10	

Acres of Grading (Site Preparation Phase): 5.6

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site preparation	Graders	2	8.00	162	0.61
Site preparation	Off-Highway Trucks	4	8.00	381	0.57
Site preparation	Rubber Tired Dozers	0	8.00	358	0.59
Site preparation	Tractors/Loaders/Backhoes	0	8.00	75	0.55
Distribute straw bales on sand dunes	Cranes	0	7.00	208	0.43
Distribute straw bales on sand dunes	Forklifts	0	8.00	149	0.30
Distribute straw bales on sand dunes	Generator Sets	0	8.00	84	0.74
Distribute straw bales on sand dunes	Off-Highway Trucks	6	8.00	381	0.57
Distribute straw bales on sand dunes	Rubber Tired Dozers	2	8.00	358	0.59
Distribute straw bales on sand dunes	Rubber Tired Loaders	2	8.00	87	0.54
Distribute straw bales on sand dunes	Tractors/Loaders/Backhoes	2	8.00	75	0.55
Distribute straw bales on sand dunes	Welders	0	8.00	46	0.45
Planting and watering	Cranes	0	7.00	208	0.43
Planting and watering	Forklifts	0	8.00	149	0.30
Planting and watering	Generator Sets	0	8.00	84	0.74
Planting and watering	Off-Highway Trucks	30	8.00	381	0.57
Planting and watering	Rubber Tired Dozers	3	8.00	358	0.59
Planting and watering	Rubber Tired Loaders	2	8.00	87	0.54
Planting and watering	Tractors/Loaders/Backhoes	5	8.00	75	0.55
Planting and watering	Welders	0	8.00	46	0.45
Clean up and restoration	Off-Highway Trucks	7	8.00	381	0.57
Clean up and restoration	Rubber Tired Dozers	2	8.00	358	0.59
Clean up and restoration	Rubber Tired Loaders	2	8.00	87	0.54
Clean up and restoration	Tractors/Loaders/Backhoes	2	8.00	75	0.55

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site preparation	6	10.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Distribute straw bales on sand dunes	12	10.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Planting and watering	40	20.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Clean up and restoration	13	10.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Site preparation - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.1878	0.0000	1.1878	0.1283	0.0000	0.1283			0.0000			0.0000
Off-Road	8.9798	102.1234	45.5654	0.0926		4.4531	4.4531		4.0968	4.0968			9,822.9713	2.9028		9,883.9300
Total	**8.9798**	**102.1234**	**45.5654**	**0.0926**	**1.1878**	**4.4531**	**5.6408**	**0.1283**	**4.0968**	**4.2251**			**9,822.9713**	**2.9028**		**9,883.9300**

3.2 Site preparation - 2014

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	0.1225	0.1525	1.8094	1.6500e-003	210.2047	1.7200e-003	210.2064	20.9816	1.5400e-003	20.9831			145.0071	0.0125		145.2693
Total	**0.1225**	**0.1525**	**1.8094**	**1.6500e-003**	**210.2047**	**1.7200e-003**	**210.2064**	**20.9816**	**1.5400e-003**	**20.9831**			**145.0071**	**0.0125**		**145.2693**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0802	0.0000	0.0802	8.6600e-003	0.0000	8.6600e-003			0.0000			0.0000
Off-Road	8.9798	102.1234	45.5654	0.0926		4.4531	4.4531		4.0968	4.0968			9,822.9713	2.9028		9,883.9300
Total	**8.9798**	**102.1234**	**45.5654**	**0.0926**	**0.0802**	**4.4531**	**4.5332**	**8.6600e-003**	**4.0968**	**4.1055**			**9,822.9713**	**2.9028**		**9,883.9300**

3.2 Site preparation - 2014

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	0.1225	0.1525	1.8094	1.6500e-003	128.7166	1.7200e-003	128.7183	12.8328	1.5400e-003	12.8343			145.0071	0.0125		145.2693
Total	**0.1225**	**0.1525**	**1.8094**	**1.6500e-003**	**128.7166**	**1.7200e-003**	**128.7183**	**12.8328**	**1.5400e-003**	**12.8343**			**145.0071**	**0.0125**		**145.2693**

3.3 Distribute straw bales on sand dunes - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					13.6268	0.0000	13.6268	6.7913	0.0000	6.7913			0.0000			0.0000
Off-Road	16.5961	187.6578	106.2621	0.1649		8.5889	8.5889		7.9017	7.9017			17,489.9157	5.1685		17,598.4533
Total	**16.5961**	**187.6578**	**106.2621**	**0.1649**	**13.6268**	**8.5889**	**22.2156**	**6.7913**	**7.9017**	**14.6931**			**17,489.9157**	**5.1685**		**17,598.4533**

3.3 Distribute straw bales on sand dunes - 2014

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	0.1225	0.1525	1.8094	1.6500e-003	210.2047	1.7200e-003	210.2064	20.9816	1.5400e-003	20.9831			145.0071	0.0125		145.2693
Total	**0.1225**	**0.1525**	**1.8094**	**1.6500e-003**	**210.2047**	**1.7200e-003**	**210.2064**	**20.9816**	**1.5400e-003**	**20.9831**			**145.0071**	**0.0125**		**145.2693**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.9198	0.0000	0.9198	0.4584	0.0000	0.4584			0.0000			0.0000
Off-Road	16.5961	187.6578	106.2621	0.1649		8.5889	8.5889		7.9017	7.9017			17,489.9156	5.1685		17,598.4533
Total	**16.5961**	**187.6578**	**106.2621**	**0.1649**	**0.9198**	**8.5889**	**9.5087**	**0.4584**	**7.9017**	**8.3602**			**17,489.9156**	**5.1685**		**17,598.4533**

3.3 Distribute straw bales on sand dunes - 2014

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	0.1225	0.1525	1.8094	1.6500e-003	128.7166	1.7200e-003	128.7183	12.8328	1.5400e-003	12.8343			145.0071	0.0125		145.2693
Total	**0.1225**	**0.1525**	**1.8094**	**1.6500e-003**	**128.7166**	**1.7200e-003**	**128.7183**	**12.8328**	**1.5400e-003**	**12.8343**			**145.0071**	**0.0125**		**145.2693**

3.4 Planting and watering - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					20.6380	0.0000	20.6380	10.2084	0.0000	10.2084			0.0000			0.0000
Off-Road	56.6676	660.5971	328.3427	0.6457		27.4494	27.4494		25.2534	25.2534			68,484.3837	20.2379		68,909.3792
Total	**56.6676**	**660.5971**	**328.3427**	**0.6457**	**20.6380**	**27.4494**	**48.0874**	**10.2084**	**25.2534**	**35.4618**			**68,484.3837**	**20.2379**		**68,909.3792**

3.4 Planting and watering - 2014

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	0.2450	0.3050	3.6187	3.3000e-003	420.4094	3.4300e-003	420.4129	41.9632	3.0800e-003	41.9662			290.0141	0.0250		290.5387
Total	**0.2450**	**0.3050**	**3.6187**	**3.3000e-003**	**420.4094**	**3.4300e-003**	**420.4129**	**41.9632**	**3.0800e-003**	**41.9662**			**290.0141**	**0.0250**		**290.5387**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.3931	0.0000	1.3931	0.6891	0.0000	0.6891			0.0000			0.0000
Off-Road	56.6676	660.5971	328.3427	0.6457		27.4494	27.4494		25.2534	25.2534			68,484.3837	20.2379		68,909.3792
Total	**56.6676**	**660.5971**	**328.3427**	**0.6457**	**1.3931**	**27.4494**	**28.8424**	**0.6891**	**25.2534**	**25.9425**			**68,484.3837**	**20.2379**		**68,909.3792**

3.4 Planting and watering - 2014

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	0.2450	0.3050	3.6187	3.3000e-003	257.4331	3.4300e-003	257.4366	25.6655	3.0800e-003	25.6686			290.0141	0.0250		290.5387
Total	**0.2450**	**0.3050**	**3.6187**	**3.3000e-003**	**257.4331**	**3.4300e-003**	**257.4366**	**25.6655**	**3.0800e-003**	**25.6686**			**290.0141**	**0.0250**		**290.5387**

3.5 Clean up and restoration - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					12.6381	0.0000	12.6381	6.6846	0.0000	6.6846			0.0000			0.0000
Off-Road	18.1031	205.6053	114.2105	0.1837		9.2765	9.2765		8.5344	8.5344			19,485.6814	5.7582		19,606.6043
Total	**18.1031**	**205.6053**	**114.2105**	**0.1837**	**12.6381**	**9.2765**	**21.9146**	**6.6846**	**8.5344**	**15.2190**			**19,485.6814**	**5.7582**		**19,606.6043**

3.5 Clean up and restoration - 2014

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	0.1225	0.1525	1.8094	1.6500e-003	210.2047	1.7200e-003	210.2064	20.9816	1.5400e-003	20.9831			145.0071	0.0125		145.2693
Total	**0.1225**	**0.1525**	**1.8094**	**1.6500e-003**	**210.2047**	**1.7200e-003**	**210.2064**	**20.9816**	**1.5400e-003**	**20.9831**			**145.0071**	**0.0125**		**145.2693**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.8531	0.0000	0.8531	0.4512	0.0000	0.4512			0.0000			0.0000
Off-Road	18.1031	205.6053	114.2105	0.1837		9.2765	9.2765		8.5344	8.5344			19,485.6814	5.7582		19,606.6043
Total	**18.1031**	**205.6053**	**114.2105**	**0.1837**	**0.8531**	**9.2765**	**10.1296**	**0.4512**	**8.5344**	**8.9856**			**19,485.6814**	**5.7582**		**19,606.6043**

3.5 Clean up and restoration - 2014

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	0.1225	0.1525	1.8094	1.6500e-003	128.7166	1.7200e-003	128.7183	12.8328	1.5400e-003	12.8343			145.0071	0.0125		145.2693
Total	**0.1225**	**0.1525**	**1.8094**	**1.6500e-003**	**128.7166**	**1.7200e-003**	**128.7183**	**12.8328**	**1.5400e-003**	**12.8343**			**145.0071**	**0.0125**		**145.2693**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Recreational	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Recreational	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.298929	0.238852	0.201373	0.075588	0.027827	0.015800	0.016059	0.098716	0.001735	0.001573	0.014785	0.002226	0.006537

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**			**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**			**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.0000e-005	0.0000	1.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000			2.2000e-004	0.0000		2.3000e-004
Unmitigated	1.0000e-005	0.0000	1.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000			2.2000e-004	0.0000		2.3000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000			2.2000e-004	0.0000		2.3000e-004
Total	**1.0000e-005**	**0.0000**	**1.1000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**			**2.2000e-004**	**0.0000**		**2.3000e-004**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000			2.2000e-004	0.0000		2.3000e-004
Total	**1.0000e-005**	**0.0000**	**1.1000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**			**2.2000e-004**	**0.0000**		**2.3000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

Keeler Dunes

Inyo County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Recreational	1.00	User Defined Unit	194.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.8	**Precipitation Freq (Days)**	34
Climate Zone	9			**Operational Year**	2015
Utility Company	Statewide Average				
CO2 Intensity (lb/MWhr)	958.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.011

1.3 User Entered Comments & Non-Default Data

Project Characteristics - The average wind speed, as recorded at the Bishop Airport Monitoring Station from 1992 to 2002, was approximately 8.4 miles per hour, which is 3.8 m/s.

Land Use - The proposed project site is 194 acres

Construction Phase - User-defined scenario

Off-road Equipment - user-defined

Off-road Equipment - User-defined scenario

Off-road Equipment - User-defined scenario

Off-road Equipment - User-defined scenario

Off-road Equipment - User-defined scenario

Off-road Equipment - User-defined scenario

Off-road Equipment - user-defined

Trips and VMT - User-defined scenario

On-road Fugitive Dust - Assumed 95 percent of travel on unpaved roads

Vehicle Trips - User-defined scenario

Energy Use - User-defined scenario

Construction Off-road Equipment Mitigation - Vehicle speeds limited to 15 mph. Exposed areas watered two times per day.

Grading - User-defined

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	120.00	5.00
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tblConstructionPhase	NumDays	120.00	80.00
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tblConstructionPhase	NumDays	120.00	782.00
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tblConstructionPhase	NumDays	120.00	782.00
tblConstructionPhase	PhaseEndDate	12/12/2017	12/31/2017
tblConstructionPhase	PhaseEndDate	12/29/2020	12/31/2017
tblConstructionPhase	PhaseEndDate	12/29/2020	12/31/2017

tblConstructionPhase	PhaseStartDate	12/13/2014	1/1/2015
tblConstructionPhase	PhaseStartDate	1/1/2018	1/1/2015
tblConstructionPhase	PhaseStartDate	1/1/2018	1/1/2015
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tblGrading	AcresOfGrading	0.00	194.00
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tblGrading	AcresOfGrading	0.00	194.00
tblGrading	AcresOfGrading	0.00	194.00
tblGrading	AcresOfGrading	0.00	194.00
tblLandUse	LotAcreage	0.00	194.00
tblOffRoadEquipment	HorsePower	255.00	358.00
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tblProjectCharacteristics	CO2IntensityFactor	1001.57	958.49
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.011
tblProjectCharacteristics	OperationalYear	2014	2015
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblProjectCharacteristics	WindSpeed	2.2	3.8
tblTripsAndVMT	WorkerTripLength	16.80	2.80
tblTripsAndVMT	WorkerTripLength	16.80	2.80
tblTripsAndVMT	WorkerTripLength	16.80	2.20
tblTripsAndVMT	WorkerTripNumber	20.00	5.00
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tblTripsAndVMT	WorkerTripNumber	13.00	6.00

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tblVehicleEF	HHD	0.01	0.03
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tblVehicleEF	HHD	4.03	16.83
tblVehicleEF	HHD	2.06	3.76
tblVehicleEF	HHD	85.27	33.46
tblVehicleEF	HHD	0.10	0.10
tblVehicleEF	HHD	4.91	29.45
tblVehicleEF	HHD	5.85	10.35
tblVehicleEF	HHD	4.86	1.52

tblVehicleEF	HHD	0.03	0.39
tblVehicleEF	HHD	0.06	0.02
tblVehicleEF	HHD	0.04	0.03
tblVehicleEF	HHD	0.11	0.37
tblVehicleEF	HHD	0.01	1.2000e-003
tblVehicleEF	HHD	0.02	0.39
tblVehicleEF	HHD	0.03	0.02
tblVehicleEF	HHD	8.7890e-003	0.03
tblVehicleEF	HHD	0.10	0.37
tblVehicleEF	HHD	8.2710e-003	1.2000e-003
tblVehicleEF	HHD	0.03	1.0000e-004
tblVehicleEF	HHD	0.94	0.03
tblVehicleEF	HHD	0.58	3.03
tblVehicleEF	HHD	0.02	1.0000e-004
tblVehicleEF	HHD	0.29	0.76
tblVehicleEF	HHD	2.01	0.02
tblVehicleEF	HHD	4.17	2.40
tblVehicleEF	HHD	5.1360e-003	0.01
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	2.3170e-003	7.0000e-004
tblVehicleEF	HHD	0.03	1.0000e-004
tblVehicleEF	HHD	0.94	0.03
tblVehicleEF	HHD	0.66	3.45
tblVehicleEF	HHD	0.02	1.0000e-004
tblVehicleEF	HHD	0.33	0.86
tblVehicleEF	HHD	2.01	0.02
tblVehicleEF	HHD	4.49	2.58
tblVehicleEF	LDA	0.02	0.02

tblVehicleEF	LDA	0.02	0.03
tblVehicleEF	LDA	2.00	2.16
tblVehicleEF	LDA	4.40	6.72
tblVehicleEF	LDA	0.31	0.30
tblVehicleEF	LDA	0.21	0.26
tblVehicleEF	LDA	0.28	0.38
tblVehicleEF	LDA	0.04	0.01
tblVehicleEF	LDA	2.7110e-003	0.01
tblVehicleEF	LDA	3.9660e-003	7.0000e-003
tblVehicleEF	LDA	0.02	0.01
tblVehicleEF	LDA	2.0000e-003	8.0000e-003
tblVehicleEF	LDA	2.4660e-003	0.01
tblVehicleEF	LDA	3.6060e-003	7.0000e-003
tblVehicleEF	LDA	0.11	0.09
tblVehicleEF	LDA	0.23	0.21
tblVehicleEF	LDA	0.09	0.04
tblVehicleEF	LDA	0.08	0.08
tblVehicleEF	LDA	0.54	0.09
tblVehicleEF	LDA	0.36	0.52
tblVehicleEF	LDA	3.5900e-003	3.5000e-003
tblVehicleEF	LDA	8.1600e-004	8.0000e-004
tblVehicleEF	LDA	0.11	0.09
tblVehicleEF	LDA	0.23	0.21
tblVehicleEF	LDA	0.09	0.04
tblVehicleEF	LDA	0.10	0.10
tblVehicleEF	LDA	0.54	0.09
tblVehicleEF	LDA	0.39	0.56
tblVehicleEF	LDA	0.02	0.02

tblVehicleEF	LDA	0.02	0.01
tblVehicleEF	LDA	2.20	2.53
tblVehicleEF	LDA	2.96	3.93
tblVehicleEF	LDA	0.31	0.30
tblVehicleEF	LDA	0.18	0.22
tblVehicleEF	LDA	0.25	0.32
tblVehicleEF	LDA	0.04	0.01
tblVehicleEF	LDA	2.7110e-003	0.01
tblVehicleEF	LDA	3.9660e-003	7.0000e-003
tblVehicleEF	LDA	0.02	0.01
tblVehicleEF	LDA	2.0000e-003	8.0000e-003
tblVehicleEF	LDA	2.4660e-003	0.01
tblVehicleEF	LDA	3.6060e-003	7.0000e-003
tblVehicleEF	LDA	0.24	0.33
tblVehicleEF	LDA	0.27	0.28
tblVehicleEF	LDA	0.15	0.17
tblVehicleEF	LDA	0.08	0.09
tblVehicleEF	LDA	0.52	0.09
tblVehicleEF	LDA	0.27	0.34
tblVehicleEF	LDA	3.8450e-003	3.9000e-003
tblVehicleEF	LDA	7.9100e-004	8.0000e-004
tblVehicleEF	LDA	0.24	0.33
tblVehicleEF	LDA	0.27	0.28
tblVehicleEF	LDA	0.15	0.17
tblVehicleEF	LDA	0.10	0.11
tblVehicleEF	LDA	0.52	0.09
tblVehicleEF	LDA	0.28	0.37
tblVehicleEF	LDA	0.02	0.02

tblVehicleEF	LDA	0.02	0.03
tblVehicleEF	LDA	2.20	2.14
tblVehicleEF	LDA	3.00	8.16
tblVehicleEF	LDA	0.31	0.30
tblVehicleEF	LDA	0.19	0.29
tblVehicleEF	LDA	0.25	0.41
tblVehicleEF	LDA	0.04	0.01
tblVehicleEF	LDA	2.7110e-003	0.01
tblVehicleEF	LDA	3.9660e-003	7.0000e-003
tblVehicleEF	LDA	0.02	0.01
tblVehicleEF	LDA	2.0000e-003	8.0000e-003
tblVehicleEF	LDA	2.4660e-003	0.01
tblVehicleEF	LDA	3.6060e-003	7.0000e-003
tblVehicleEF	LDA	0.37	0.01
tblVehicleEF	LDA	0.47	0.21
tblVehicleEF	LDA	0.25	0.01
tblVehicleEF	LDA	0.08	0.08
tblVehicleEF	LDA	0.63	0.10
tblVehicleEF	LDA	0.27	0.61
tblVehicleEF	LDA	3.8290e-003	3.4000e-003
tblVehicleEF	LDA	7.9100e-004	8.0000e-004
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tblVehicleEF	LDA	0.47	0.21
tblVehicleEF	LDA	0.25	0.01
tblVehicleEF	LDA	0.10	0.10
tblVehicleEF	LDA	0.63	0.10
tblVehicleEF	LDA	0.29	0.65
tblVehicleEF	LDT1	0.04	0.05

tblVehicleEF	LDT1	0.05	0.06
tblVehicleEF	LDT1	7.39	7.97
tblVehicleEF	LDT1	11.80	15.55
tblVehicleEF	LDT1	0.12	0.24
tblVehicleEF	LDT1	0.71	0.99
tblVehicleEF	LDT1	0.52	0.67
tblVehicleEF	LDT1	0.04	0.01
tblVehicleEF	LDT1	6.7850e-003	0.01
tblVehicleEF	LDT1	8.8680e-003	0.01
tblVehicleEF	LDT1	0.02	0.01
tblVehicleEF	LDT1	2.0000e-003	8.0000e-003
tblVehicleEF	LDT1	6.0870e-003	0.01
tblVehicleEF	LDT1	7.9660e-003	0.01
tblVehicleEF	LDT1	0.33	0.23
tblVehicleEF	LDT1	0.54	0.44
tblVehicleEF	LDT1	0.24	0.11
tblVehicleEF	LDT1	0.30	0.33
tblVehicleEF	LDT1	1.82	0.38
tblVehicleEF	LDT1	0.92	1.17
tblVehicleEF	LDT1	4.2510e-003	4.3000e-003
tblVehicleEF	LDT1	1.0880e-003	1.1000e-003
tblVehicleEF	LDT1	0.33	0.23
tblVehicleEF	LDT1	0.54	0.44
tblVehicleEF	LDT1	0.24	0.11
tblVehicleEF	LDT1	0.35	0.38
tblVehicleEF	LDT1	1.82	0.38
tblVehicleEF	LDT1	0.99	1.25
tblVehicleEF	LDT1	0.04	0.05

tblVehicleEF	LDT1	0.05	0.04
tblVehicleEF	LDT1	7.77	8.71
tblVehicleEF	LDT1	7.93	9.13
tblVehicleEF	LDT1	0.12	0.24
tblVehicleEF	LDT1	0.61	0.85
tblVehicleEF	LDT1	0.46	0.57
tblVehicleEF	LDT1	0.04	0.01
tblVehicleEF	LDT1	6.7850e-003	0.01
tblVehicleEF	LDT1	8.8680e-003	0.01
tblVehicleEF	LDT1	0.02	0.01
tblVehicleEF	LDT1	2.0000e-003	8.0000e-003
tblVehicleEF	LDT1	6.0870e-003	0.01
tblVehicleEF	LDT1	7.9660e-003	0.01
tblVehicleEF	LDT1	0.70	0.82
tblVehicleEF	LDT1	0.63	0.59
tblVehicleEF	LDT1	0.43	0.43
tblVehicleEF	LDT1	0.30	0.34
tblVehicleEF	LDT1	1.70	0.36
tblVehicleEF	LDT1	0.67	0.75
tblVehicleEF	LDT1	4.5200e-003	4.8000e-003
tblVehicleEF	LDT1	1.0190e-003	1.0000e-003
tblVehicleEF	LDT1	0.70	0.82
tblVehicleEF	LDT1	0.63	0.59
tblVehicleEF	LDT1	0.43	0.43
tblVehicleEF	LDT1	0.35	0.39
tblVehicleEF	LDT1	1.70	0.36
tblVehicleEF	LDT1	0.71	0.80
tblVehicleEF	LDT1	0.04	0.05

tblVehicleEF	LDT1	0.05	0.07
tblVehicleEF	LDT1	7.79	8.14
tblVehicleEF	LDT1	8.05	18.88
tblVehicleEF	LDT1	0.12	0.24
tblVehicleEF	LDT1	0.63	1.09
tblVehicleEF	LDT1	0.46	0.73
tblVehicleEF	LDT1	0.04	0.01
tblVehicleEF	LDT1	6.7850e-003	0.01
tblVehicleEF	LDT1	8.8680e-003	0.01
tblVehicleEF	LDT1	0.02	0.01
tblVehicleEF	LDT1	2.0000e-003	8.0000e-003
tblVehicleEF	LDT1	6.0870e-003	0.01
tblVehicleEF	LDT1	7.9660e-003	0.01
tblVehicleEF	LDT1	1.09	0.04
tblVehicleEF	LDT1	1.17	0.46
tblVehicleEF	LDT1	0.73	0.02
tblVehicleEF	LDT1	0.31	0.34
tblVehicleEF	LDT1	2.29	0.44
tblVehicleEF	LDT1	0.68	1.38
tblVehicleEF	LDT1	4.5030e-003	4.3000e-003
tblVehicleEF	LDT1	1.0220e-003	1.1000e-003
tblVehicleEF	LDT1	1.09	0.04
tblVehicleEF	LDT1	1.17	0.46
tblVehicleEF	LDT1	0.73	0.02
tblVehicleEF	LDT1	0.36	0.39
tblVehicleEF	LDT1	2.29	0.44
tblVehicleEF	LDT1	0.72	1.48
tblVehicleEF	LDT2	0.03	0.03

tblVehicleEF	LDT2	0.03	0.03
tblVehicleEF	LDT2	3.32	3.29
tblVehicleEF	LDT2	6.72	9.01
tblVehicleEF	LDT2	0.18	0.20
tblVehicleEF	LDT2	0.44	0.53
tblVehicleEF	LDT2	0.58	0.73
tblVehicleEF	LDT2	0.04	0.01
tblVehicleEF	LDT2	3.0560e-003	0.02
tblVehicleEF	LDT2	4.3330e-003	0.01
tblVehicleEF	LDT2	0.02	0.01
tblVehicleEF	LDT2	2.0000e-003	8.0000e-003
tblVehicleEF	LDT2	2.7600e-003	0.02
tblVehicleEF	LDT2	3.9230e-003	0.01
tblVehicleEF	LDT2	0.15	0.10
tblVehicleEF	LDT2	0.28	0.21
tblVehicleEF	LDT2	0.11	0.05
tblVehicleEF	LDT2	0.13	0.12
tblVehicleEF	LDT2	0.99	0.18
tblVehicleEF	LDT2	0.52	0.67
tblVehicleEF	LDT2	4.9000e-003	4.3000e-003
tblVehicleEF	LDT2	1.1320e-003	1.0000e-003
tblVehicleEF	LDT2	0.15	0.10
tblVehicleEF	LDT2	0.28	0.21
tblVehicleEF	LDT2	0.11	0.05
tblVehicleEF	LDT2	0.16	0.15
tblVehicleEF	LDT2	0.99	0.18
tblVehicleEF	LDT2	0.56	0.72
tblVehicleEF	LDT2	0.03	0.03

tblVehicleEF	LDT2	0.03	0.02
tblVehicleEF	LDT2	3.59	3.76
tblVehicleEF	LDT2	4.50	5.26
tblVehicleEF	LDT2	0.18	0.20
tblVehicleEF	LDT2	0.38	0.46
tblVehicleEF	LDT2	0.51	0.62
tblVehicleEF	LDT2	0.04	0.01
tblVehicleEF	LDT2	3.0560e-003	0.02
tblVehicleEF	LDT2	4.3330e-003	0.01
tblVehicleEF	LDT2	0.02	0.01
tblVehicleEF	LDT2	2.0000e-003	8.0000e-003
tblVehicleEF	LDT2	2.7600e-003	0.02
tblVehicleEF	LDT2	3.9230e-003	0.01
tblVehicleEF	LDT2	0.32	0.36
tblVehicleEF	LDT2	0.32	0.29
tblVehicleEF	LDT2	0.20	0.19
tblVehicleEF	LDT2	0.13	0.13
tblVehicleEF	LDT2	0.93	0.17
tblVehicleEF	LDT2	0.39	0.44
tblVehicleEF	LDT2	5.2330e-003	4.9000e-003
tblVehicleEF	LDT2	1.0930e-003	1.0000e-003
tblVehicleEF	LDT2	0.32	0.36
tblVehicleEF	LDT2	0.32	0.29
tblVehicleEF	LDT2	0.20	0.19
tblVehicleEF	LDT2	0.16	0.16
tblVehicleEF	LDT2	0.93	0.17
tblVehicleEF	LDT2	0.41	0.47
tblVehicleEF	LDT2	0.03	0.03

tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	3.59	3.29
tblVehicleEF	LDT2	4.57	10.93
tblVehicleEF	LDT2	0.18	0.20
tblVehicleEF	LDT2	0.39	0.59
tblVehicleEF	LDT2	0.51	0.79
tblVehicleEF	LDT2	0.04	0.01
tblVehicleEF	LDT2	3.0560e-003	0.02
tblVehicleEF	LDT2	4.3330e-003	0.01
tblVehicleEF	LDT2	0.02	0.01
tblVehicleEF	LDT2	2.0000e-003	8.0000e-003
tblVehicleEF	LDT2	2.7600e-003	0.02
tblVehicleEF	LDT2	3.9230e-003	0.01
tblVehicleEF	LDT2	0.48	0.02
tblVehicleEF	LDT2	0.58	0.22
tblVehicleEF	LDT2	0.34	0.01
tblVehicleEF	LDT2	0.13	0.12
tblVehicleEF	LDT2	1.26	0.21
tblVehicleEF	LDT2	0.39	0.79
tblVehicleEF	LDT2	5.2120e-003	4.3000e-003
tblVehicleEF	LDT2	1.0940e-003	1.1000e-003
tblVehicleEF	LDT2	0.48	0.02
tblVehicleEF	LDT2	0.58	0.22
tblVehicleEF	LDT2	0.34	0.01
tblVehicleEF	LDT2	0.16	0.15
tblVehicleEF	LDT2	1.26	0.21
tblVehicleEF	LDT2	0.42	0.84
tblVehicleEF	LHD1	1.1760e-003	1.6000e-003

tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	0.17	0.22
tblVehicleEF	LHD1	4.11	1.02
tblVehicleEF	LHD1	7.76	4.01
tblVehicleEF	LHD1	0.10	0.03
tblVehicleEF	LHD1	0.09	0.02
tblVehicleEF	LHD1	2.62	0.99
tblVehicleEF	LHD1	1.29	1.48
tblVehicleEF	LHD1	1.0240e-003	3.0000e-004
tblVehicleEF	LHD1	0.06	0.01
tblVehicleEF	LHD1	9.9260e-003	0.01
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	1.7330e-003	1.1000e-003
tblVehicleEF	LHD1	9.4200e-004	3.0000e-004
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	2.4820e-003	0.01
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	1.5880e-003	1.1000e-003
tblVehicleEF	LHD1	5.0000e-003	6.0000e-004
tblVehicleEF	LHD1	0.14	0.01
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.2100e-003	2.0000e-004
tblVehicleEF	LHD1	0.39	0.10
tblVehicleEF	LHD1	1.17	0.18
tblVehicleEF	LHD1	0.59	0.26
tblVehicleEF	LHD1	9.4000e-005	1.0000e-004
tblVehicleEF	LHD1	7.4900e-003	8.2000e-003

tblVehicleEF	LHD1	4.6400e-004	4.0000e-004
tblVehicleEF	LHD1	5.0000e-003	6.0000e-004
tblVehicleEF	LHD1	0.14	0.01
tblVehicleEF	LHD1	0.03	0.04
tblVehicleEF	LHD1	2.2100e-003	2.0000e-004
tblVehicleEF	LHD1	0.44	0.12
tblVehicleEF	LHD1	1.17	0.18
tblVehicleEF	LHD1	0.63	0.28
tblVehicleEF	LHD1	1.1760e-003	1.6000e-003
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	0.17	0.22
tblVehicleEF	LHD1	4.22	1.04
tblVehicleEF	LHD1	5.09	2.17
tblVehicleEF	LHD1	0.10	0.03
tblVehicleEF	LHD1	0.09	0.02
tblVehicleEF	LHD1	2.46	0.94
tblVehicleEF	LHD1	1.20	1.34
tblVehicleEF	LHD1	1.0240e-003	3.0000e-004
tblVehicleEF	LHD1	0.06	0.01
tblVehicleEF	LHD1	9.9260e-003	0.01
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	1.7330e-003	1.1000e-003
tblVehicleEF	LHD1	9.4200e-004	3.0000e-004
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	2.4820e-003	0.01
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	1.5880e-003	1.1000e-003

tblVehicleEF	LHD1	0.01	1.9000e-003
tblVehicleEF	LHD1	0.15	0.02
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	3.6790e-003	5.0000e-004
tblVehicleEF	LHD1	0.40	0.11
tblVehicleEF	LHD1	1.14	0.17
tblVehicleEF	LHD1	0.46	0.18
tblVehicleEF	LHD1	9.4000e-005	1.0000e-004
tblVehicleEF	LHD1	7.4930e-003	8.2000e-003
tblVehicleEF	LHD1	4.1800e-004	4.0000e-004
tblVehicleEF	LHD1	0.01	1.9000e-003
tblVehicleEF	LHD1	0.15	0.02
tblVehicleEF	LHD1	0.03	0.04
tblVehicleEF	LHD1	3.6790e-003	5.0000e-004
tblVehicleEF	LHD1	0.45	0.13
tblVehicleEF	LHD1	1.14	0.17
tblVehicleEF	LHD1	0.49	0.19
tblVehicleEF	LHD1	1.1760e-003	1.6000e-003
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	0.17	0.22
tblVehicleEF	LHD1	4.22	1.02
tblVehicleEF	LHD1	5.09	4.88
tblVehicleEF	LHD1	0.10	0.03
tblVehicleEF	LHD1	0.09	0.02
tblVehicleEF	LHD1	2.51	1.02
tblVehicleEF	LHD1	1.20	1.55
tblVehicleEF	LHD1	1.0240e-003	3.0000e-004

tblVehicleEF	LHD1	0.06	0.01
tblVehicleEF	LHD1	9.9260e-003	0.01
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	1.7330e-003	1.1000e-003
tblVehicleEF	LHD1	9.4200e-004	3.0000e-004
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	2.4820e-003	0.01
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	1.5880e-003	1.1000e-003
tblVehicleEF	LHD1	0.02	2.0000e-004
tblVehicleEF	LHD1	0.30	0.02
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	6.7900e-003	1.0000e-004
tblVehicleEF	LHD1	0.40	0.10
tblVehicleEF	LHD1	1.32	0.19
tblVehicleEF	LHD1	0.46	0.30
tblVehicleEF	LHD1	9.4000e-005	1.0000e-004
tblVehicleEF	LHD1	7.4930e-003	8.2000e-003
tblVehicleEF	LHD1	4.1800e-004	5.0000e-004
tblVehicleEF	LHD1	0.02	2.0000e-004
tblVehicleEF	LHD1	0.30	0.02
tblVehicleEF	LHD1	0.03	0.04
tblVehicleEF	LHD1	6.7900e-003	1.0000e-004
tblVehicleEF	LHD1	0.45	0.12
tblVehicleEF	LHD1	1.32	0.19
tblVehicleEF	LHD1	0.49	0.32
tblVehicleEF	LHD2	7.0600e-004	1.4000e-003
tblVehicleEF	LHD2	0.02	0.02

tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	0.11	0.19
tblVehicleEF	LHD2	1.86	2.77
tblVehicleEF	LHD2	2.56	7.84
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	0.16	0.05
tblVehicleEF	LHD2	3.25	2.02
tblVehicleEF	LHD2	0.45	1.44
tblVehicleEF	LHD2	1.7880e-003	7.0000e-004
tblVehicleEF	LHD2	0.08	0.01
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.04	0.02
tblVehicleEF	LHD2	5.5700e-004	1.5000e-003
tblVehicleEF	LHD2	1.6450e-003	7.0000e-004
tblVehicleEF	LHD2	0.03	0.01
tblVehicleEF	LHD2	2.8070e-003	0.01
tblVehicleEF	LHD2	0.04	0.02
tblVehicleEF	LHD2	4.9200e-004	1.5000e-003
tblVehicleEF	LHD2	1.5460e-003	1.9000e-003
tblVehicleEF	LHD2	0.04	0.05
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	7.5500e-004	4.0000e-004
tblVehicleEF	LHD2	0.24	0.30
tblVehicleEF	LHD2	0.25	0.63
tblVehicleEF	LHD2	0.20	0.50
tblVehicleEF	LHD2	1.0200e-004	1.0000e-004
tblVehicleEF	LHD2	5.9130e-003	7.3000e-003
tblVehicleEF	LHD2	1.7800e-004	4.0000e-004

tblVehicleEF	LHD2	1.5460e-003	1.9000e-003
tblVehicleEF	LHD2	0.04	0.05
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	7.5500e-004	4.0000e-004
tblVehicleEF	LHD2	0.27	0.33
tblVehicleEF	LHD2	0.25	0.63
tblVehicleEF	LHD2	0.21	0.53
tblVehicleEF	LHD2	7.0600e-004	1.4000e-003
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.11	0.19
tblVehicleEF	LHD2	1.88	2.87
tblVehicleEF	LHD2	1.63	4.09
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	0.16	0.05
tblVehicleEF	LHD2	3.09	1.91
tblVehicleEF	LHD2	0.42	1.30
tblVehicleEF	LHD2	1.7880e-003	7.0000e-004
tblVehicleEF	LHD2	0.08	0.01
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.04	0.02
tblVehicleEF	LHD2	5.5700e-004	1.5000e-003
tblVehicleEF	LHD2	1.6450e-003	7.0000e-004
tblVehicleEF	LHD2	0.03	0.01
tblVehicleEF	LHD2	2.8070e-003	0.01
tblVehicleEF	LHD2	0.04	0.02
tblVehicleEF	LHD2	4.9200e-004	1.5000e-003
tblVehicleEF	LHD2	3.2640e-003	6.1000e-003

tblVehicleEF	LHD2	0.05	0.07
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	1.2830e-003	1.2000e-003
tblVehicleEF	LHD2	0.24	0.31
tblVehicleEF	LHD2	0.24	0.62
tblVehicleEF	LHD2	0.15	0.33
tblVehicleEF	LHD2	1.0200e-004	1.0000e-004
tblVehicleEF	LHD2	5.9130e-003	7.3000e-003
tblVehicleEF	LHD2	1.6200e-004	4.0000e-004
tblVehicleEF	LHD2	3.2640e-003	6.1000e-003
tblVehicleEF	LHD2	0.05	0.07
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	1.2830e-003	1.2000e-003
tblVehicleEF	LHD2	0.27	0.35
tblVehicleEF	LHD2	0.24	0.62
tblVehicleEF	LHD2	0.16	0.36
tblVehicleEF	LHD2	7.0600e-004	1.4000e-003
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	0.01	0.03
tblVehicleEF	LHD2	0.11	0.19
tblVehicleEF	LHD2	1.88	2.72
tblVehicleEF	LHD2	1.63	9.57
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	0.16	0.05
tblVehicleEF	LHD2	3.15	2.08
tblVehicleEF	LHD2	0.42	1.51
tblVehicleEF	LHD2	1.7880e-003	7.0000e-004
tblVehicleEF	LHD2	0.08	0.01

tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.04	0.02
tblVehicleEF	LHD2	5.5700e-004	1.5000e-003
tblVehicleEF	LHD2	1.6450e-003	7.0000e-004
tblVehicleEF	LHD2	0.03	0.01
tblVehicleEF	LHD2	2.8070e-003	0.01
tblVehicleEF	LHD2	0.04	0.02
tblVehicleEF	LHD2	4.9200e-004	1.5000e-003
tblVehicleEF	LHD2	5.1450e-003	4.0000e-004
tblVehicleEF	LHD2	0.09	0.06
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	2.4490e-003	1.0000e-004
tblVehicleEF	LHD2	0.24	0.29
tblVehicleEF	LHD2	0.28	0.68
tblVehicleEF	LHD2	0.15	0.58
tblVehicleEF	LHD2	1.0200e-004	1.0000e-004
tblVehicleEF	LHD2	5.9130e-003	7.3000e-003
tblVehicleEF	LHD2	1.6200e-004	5.0000e-004
tblVehicleEF	LHD2	5.1450e-003	4.0000e-004
tblVehicleEF	LHD2	0.09	0.06
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	2.4490e-003	1.0000e-004
tblVehicleEF	LHD2	0.27	0.33
tblVehicleEF	LHD2	0.28	0.68
tblVehicleEF	LHD2	0.16	0.62
tblVehicleEF	MCY	0.00	0.22
tblVehicleEF	MCY	0.00	0.16
tblVehicleEF	MCY	32.11	32.39

tblVehicleEF	MCY	10.95	12.41
tblVehicleEF	MCY	7.3920e-003	0.01
tblVehicleEF	MCY	1.31	1.37
tblVehicleEF	MCY	0.32	0.32
tblVehicleEF	MCY	0.04	6.3000e-003
tblVehicleEF	MCY	8.0000e-003	4.0000e-003
tblVehicleEF	MCY	8.0500e-004	0.02
tblVehicleEF	MCY	2.3350e-003	0.01
tblVehicleEF	MCY	0.02	6.3000e-003
tblVehicleEF	MCY	2.0000e-003	4.0000e-003
tblVehicleEF	MCY	6.4500e-004	0.02
tblVehicleEF	MCY	1.8350e-003	0.01
tblVehicleEF	MCY	1.12	0.64
tblVehicleEF	MCY	0.57	0.28
tblVehicleEF	MCY	0.72	0.23
tblVehicleEF	MCY	3.00	3.04
tblVehicleEF	MCY	1.99	0.34
tblVehicleEF	MCY	2.40	2.62
tblVehicleEF	MCY	2.1750e-003	2.1000e-003
tblVehicleEF	MCY	7.0800e-004	7.0000e-004
tblVehicleEF	MCY	1.12	0.64
tblVehicleEF	MCY	0.57	0.28
tblVehicleEF	MCY	0.72	0.23
tblVehicleEF	MCY	3.27	3.31
tblVehicleEF	MCY	1.99	0.34
tblVehicleEF	MCY	2.58	2.82
tblVehicleEF	MCY	0.00	0.21
tblVehicleEF	MCY	0.00	0.11

tblVehicleEF	MCY	29.81	29.27
tblVehicleEF	MCY	8.78	8.78
tblVehicleEF	MCY	7.3920e-003	0.01
tblVehicleEF	MCY	1.12	1.15
tblVehicleEF	MCY	0.29	0.28
tblVehicleEF	MCY	0.04	6.3000e-003
tblVehicleEF	MCY	8.0000e-003	4.0000e-003
tblVehicleEF	MCY	8.0500e-004	0.02
tblVehicleEF	MCY	2.3350e-003	0.01
tblVehicleEF	MCY	0.02	6.3000e-003
tblVehicleEF	MCY	2.0000e-003	4.0000e-003
tblVehicleEF	MCY	6.4500e-004	0.02
tblVehicleEF	MCY	1.8350e-003	0.01
tblVehicleEF	MCY	2.49	2.47
tblVehicleEF	MCY	0.75	0.51
tblVehicleEF	MCY	1.40	1.21
tblVehicleEF	MCY	2.83	2.81
tblVehicleEF	MCY	1.87	0.33
tblVehicleEF	MCY	1.87	1.83
tblVehicleEF	MCY	2.1340e-003	2.1000e-003
tblVehicleEF	MCY	6.5700e-004	6.0000e-004
tblVehicleEF	MCY	2.49	2.47
tblVehicleEF	MCY	0.75	0.51
tblVehicleEF	MCY	1.40	1.21
tblVehicleEF	MCY	3.09	3.07
tblVehicleEF	MCY	1.87	0.33
tblVehicleEF	MCY	2.01	1.97
tblVehicleEF	MCY	0.00	0.23

tblVehicleEF	MCY	0.00	0.19
tblVehicleEF	MCY	30.06	35.29
tblVehicleEF	MCY	8.82	14.27
tblVehicleEF	MCY	7.3920e-003	0.01
tblVehicleEF	MCY	1.17	1.48
tblVehicleEF	MCY	0.29	0.35
tblVehicleEF	MCY	0.04	6.3000e-003
tblVehicleEF	MCY	8.0000e-003	4.0000e-003
tblVehicleEF	MCY	8.0500e-004	0.02
tblVehicleEF	MCY	2.3350e-003	0.01
tblVehicleEF	MCY	0.02	6.3000e-003
tblVehicleEF	MCY	2.0000e-003	4.0000e-003
tblVehicleEF	MCY	6.4500e-004	0.02
tblVehicleEF	MCY	1.8350e-003	0.01
tblVehicleEF	MCY	4.38	0.05
tblVehicleEF	MCY	1.78	0.28
tblVehicleEF	MCY	2.91	0.02
tblVehicleEF	MCY	2.84	3.19
tblVehicleEF	MCY	2.45	0.40
tblVehicleEF	MCY	1.88	3.04
tblVehicleEF	MCY	2.1380e-003	2.2000e-003
tblVehicleEF	MCY	6.5800e-004	7.0000e-004
tblVehicleEF	MCY	4.38	0.05
tblVehicleEF	MCY	1.78	0.28
tblVehicleEF	MCY	2.91	0.02
tblVehicleEF	MCY	3.10	3.47
tblVehicleEF	MCY	2.45	0.40
tblVehicleEF	MCY	2.02	3.26

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tblVehicleEF	MDV	0.05	0.04
tblVehicleEF	MDV	4.37	3.65
tblVehicleEF	MDV	10.31	10.27
tblVehicleEF	MDV	0.15	0.08
tblVehicleEF	MDV	0.77	0.65
tblVehicleEF	MDV	0.97	0.93
tblVehicleEF	MDV	0.04	0.01
tblVehicleEF	MDV	3.4880e-003	0.02
tblVehicleEF	MDV	5.1450e-003	0.01
tblVehicleEF	MDV	0.02	0.01
tblVehicleEF	MDV	2.0000e-003	8.0000e-003
tblVehicleEF	MDV	3.1920e-003	0.02
tblVehicleEF	MDV	4.7220e-003	0.01
tblVehicleEF	MDV	0.18	0.09
tblVehicleEF	MDV	0.35	0.21
tblVehicleEF	MDV	0.13	0.05
tblVehicleEF	MDV	0.18	0.14
tblVehicleEF	MDV	1.34	0.18
tblVehicleEF	MDV	0.91	0.85
tblVehicleEF	MDV	6.1930e-003	5.9000e-003
tblVehicleEF	MDV	1.4490e-003	1.4000e-003
tblVehicleEF	MDV	0.18	0.09
tblVehicleEF	MDV	0.35	0.21
tblVehicleEF	MDV	0.13	0.05
tblVehicleEF	MDV	0.23	0.18
tblVehicleEF	MDV	1.34	0.18
tblVehicleEF	MDV	0.97	0.91

tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	0.05	0.03
tblVehicleEF	MDV	4.78	4.15
tblVehicleEF	MDV	6.91	6.04
tblVehicleEF	MDV	0.15	0.08
tblVehicleEF	MDV	0.66	0.56
tblVehicleEF	MDV	0.85	0.79
tblVehicleEF	MDV	0.04	0.01
tblVehicleEF	MDV	3.4880e-003	0.02
tblVehicleEF	MDV	5.1450e-003	0.01
tblVehicleEF	MDV	0.02	0.01
tblVehicleEF	MDV	2.0000e-003	8.0000e-003
tblVehicleEF	MDV	3.1920e-003	0.02
tblVehicleEF	MDV	4.7220e-003	0.01
tblVehicleEF	MDV	0.38	0.32
tblVehicleEF	MDV	0.41	0.27
tblVehicleEF	MDV	0.24	0.18
tblVehicleEF	MDV	0.19	0.15
tblVehicleEF	MDV	1.25	0.17
tblVehicleEF	MDV	0.67	0.56
tblVehicleEF	MDV	6.6080e-003	6.7000e-003
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tblVehicleEF	MDV	0.38	0.32
tblVehicleEF	MDV	0.41	0.27
tblVehicleEF	MDV	0.24	0.18
tblVehicleEF	MDV	0.24	0.19
tblVehicleEF	MDV	1.25	0.17
tblVehicleEF	MDV	0.72	0.60

tblVehicleEF	MDV	0.04	0.03
tblVehicleEF	MDV	0.05	0.05
tblVehicleEF	MDV	4.77	3.69
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tblVehicleEF	MDV	0.15	0.08
tblVehicleEF	MDV	0.69	0.72
tblVehicleEF	MDV	0.86	1.01
tblVehicleEF	MDV	0.04	0.01
tblVehicleEF	MDV	3.4880e-003	0.02
tblVehicleEF	MDV	5.1450e-003	0.01
tblVehicleEF	MDV	0.02	0.01
tblVehicleEF	MDV	2.0000e-003	8.0000e-003
tblVehicleEF	MDV	3.1920e-003	0.02
tblVehicleEF	MDV	4.7220e-003	0.01
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tblVehicleEF	MDV	0.72	0.21
tblVehicleEF	MDV	0.38	0.01
tblVehicleEF	MDV	0.19	0.14
tblVehicleEF	MDV	1.71	0.21
tblVehicleEF	MDV	0.68	0.99
tblVehicleEF	MDV	6.5810e-003	5.8000e-003
tblVehicleEF	MDV	1.3900e-003	1.4000e-003
tblVehicleEF	MDV	0.55	0.01
tblVehicleEF	MDV	0.72	0.21
tblVehicleEF	MDV	0.38	0.01
tblVehicleEF	MDV	0.24	0.18
tblVehicleEF	MDV	1.71	0.21
tblVehicleEF	MDV	0.72	1.06

tblVehicleEF	MH	0.00	0.07
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tblVehicleEF	MH	2.27	3.29
tblVehicleEF	MH	1.39	1.85
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tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.5670e-003	1.2000e-003
tblVehicleEF	MH	0.02	0.01
tblVehicleEF	MH	2.1170e-003	0.01
tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.2270e-003	1.2000e-003
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tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.69	0.46
tblVehicleEF	MH	0.35	0.61
tblVehicleEF	MH	3.06	0.04
tblVehicleEF	MH	1.06	1.73
tblVehicleEF	MH	7.5500e-003	7.8000e-003
tblVehicleEF	MH	6.5500e-004	8.0000e-004
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tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.69	0.46
tblVehicleEF	MH	0.40	0.69
tblVehicleEF	MH	3.06	0.04

tblVehicleEF	MH	1.14	1.85
tblVehicleEF	MH	0.00	0.07
tblVehicleEF	MH	0.00	0.06
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tblVehicleEF	MH	10.76	14.48
tblVehicleEF	MH	6.0920e-003	6.5370e-003
tblVehicleEF	MH	2.04	2.92
tblVehicleEF	MH	1.30	1.68
tblVehicleEF	MH	0.05	0.01
tblVehicleEF	MH	8.4670e-003	0.01
tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.5670e-003	1.2000e-003
tblVehicleEF	MH	0.02	0.01
tblVehicleEF	MH	2.1170e-003	0.01
tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.2270e-003	1.2000e-003
tblVehicleEF	MH	4.33	6.30
tblVehicleEF	MH	0.15	0.18
tblVehicleEF	MH	1.00	1.39
tblVehicleEF	MH	0.35	0.63
tblVehicleEF	MH	2.99	0.04
tblVehicleEF	MH	0.75	1.01
tblVehicleEF	MH	7.5520e-003	7.8000e-003
tblVehicleEF	MH	5.4300e-004	6.0000e-004
tblVehicleEF	MH	4.33	6.30
tblVehicleEF	MH	0.15	0.18
tblVehicleEF	MH	1.00	1.39
tblVehicleEF	MH	0.40	0.72

tblVehicleEF	MH	2.99	0.04
tblVehicleEF	MH	0.80	1.08
tblVehicleEF	MH	0.00	0.07
tblVehicleEF	MH	0.00	0.12
tblVehicleEF	MH	9.92	15.79
tblVehicleEF	MH	10.77	35.84
tblVehicleEF	MH	6.0920e-003	6.5370e-003
tblVehicleEF	MH	2.10	3.49
tblVehicleEF	MH	1.30	1.95
tblVehicleEF	MH	0.05	0.01
tblVehicleEF	MH	8.4670e-003	0.01
tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.5670e-003	1.2000e-003
tblVehicleEF	MH	0.02	0.01
tblVehicleEF	MH	2.1170e-003	0.01
tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.2270e-003	1.2000e-003
tblVehicleEF	MH	6.84	0.35
tblVehicleEF	MH	0.29	0.15
tblVehicleEF	MH	2.17	0.16
tblVehicleEF	MH	0.35	0.60
tblVehicleEF	MH	3.30	0.04
tblVehicleEF	MH	0.75	2.07
tblVehicleEF	MH	7.5530e-003	7.8000e-003
tblVehicleEF	MH	5.4300e-004	1.0000e-003
tblVehicleEF	MH	6.84	0.35
tblVehicleEF	MH	0.29	0.15
tblVehicleEF	MH	2.17	0.16

tblVehicleEF	MH	0.40	0.69
tblVehicleEF	MH	3.30	0.04
tblVehicleEF	MH	0.80	2.22
tblVehicleEF	MHD	0.01	1.1000e-003
tblVehicleEF	MHD	9.5610e-003	0.01
tblVehicleEF	MHD	0.00	0.09
tblVehicleEF	MHD	2.40	0.16
tblVehicleEF	MHD	3.00	3.60
tblVehicleEF	MHD	34.03	15.11
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	7.04	0.16
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tblVehicleEF	MHD	2.05	0.86
tblVehicleEF	MHD	0.07	2.4000e-003
tblVehicleEF	MHD	0.10	0.01
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	0.12	0.14
tblVehicleEF	MHD	9.7780e-003	1.7000e-003
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tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	2.7180e-003	0.01
tblVehicleEF	MHD	0.11	0.14
tblVehicleEF	MHD	7.7670e-003	1.7000e-003
tblVehicleEF	MHD	8.7340e-003	1.6000e-003
tblVehicleEF	MHD	0.40	0.04
tblVehicleEF	MHD	0.29	0.02
tblVehicleEF	MHD	4.2500e-003	4.0000e-004
tblVehicleEF	MHD	0.32	0.23

tblVehicleEF	MHD	1.66	0.43
tblVehicleEF	MHD	3.22	1.49
tblVehicleEF	MHD	5.7810e-003	1.0000e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	1.4330e-003	5.0000e-004
tblVehicleEF	MHD	8.7340e-003	1.6000e-003
tblVehicleEF	MHD	0.40	0.04
tblVehicleEF	MHD	0.33	0.02
tblVehicleEF	MHD	4.2500e-003	4.0000e-004
tblVehicleEF	MHD	0.36	0.26
tblVehicleEF	MHD	1.66	0.43
tblVehicleEF	MHD	3.46	1.61
tblVehicleEF	MHD	0.01	1.1000e-003
tblVehicleEF	MHD	9.5610e-003	0.01
tblVehicleEF	MHD	0.00	0.06
tblVehicleEF	MHD	1.74	0.16
tblVehicleEF	MHD	2.92	3.52
tblVehicleEF	MHD	25.39	9.88
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	7.27	0.16
tblVehicleEF	MHD	4.17	3.72
tblVehicleEF	MHD	1.91	0.78
tblVehicleEF	MHD	0.06	2.4000e-003
tblVehicleEF	MHD	0.10	0.01
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	0.12	0.14
tblVehicleEF	MHD	9.7780e-003	1.7000e-003
tblVehicleEF	MHD	0.06	2.4000e-003

tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	2.7180e-003	0.01
tblVehicleEF	MHD	0.11	0.14
tblVehicleEF	MHD	7.7670e-003	1.7000e-003
tblVehicleEF	MHD	0.02	5.3000e-003
tblVehicleEF	MHD	0.45	0.06
tblVehicleEF	MHD	0.28	0.02
tblVehicleEF	MHD	7.3470e-003	1.3000e-003
tblVehicleEF	MHD	0.32	0.23
tblVehicleEF	MHD	1.62	0.43
tblVehicleEF	MHD	2.34	0.93
tblVehicleEF	MHD	6.1240e-003	1.0000e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	1.2700e-003	4.0000e-004
tblVehicleEF	MHD	0.02	5.3000e-003
tblVehicleEF	MHD	0.45	0.06
tblVehicleEF	MHD	0.31	0.02
tblVehicleEF	MHD	7.3470e-003	1.3000e-003
tblVehicleEF	MHD	0.36	0.26
tblVehicleEF	MHD	1.62	0.43
tblVehicleEF	MHD	2.52	1.00
tblVehicleEF	MHD	0.01	1.1000e-003
tblVehicleEF	MHD	9.5610e-003	0.01
tblVehicleEF	MHD	0.00	0.11
tblVehicleEF	MHD	3.30	0.16
tblVehicleEF	MHD	2.93	3.72
tblVehicleEF	MHD	25.46	17.63
tblVehicleEF	MHD	0.02	0.02

tblVehicleEF	MHD	6.73	0.16
tblVehicleEF	MHD	4.25	4.01
tblVehicleEF	MHD	1.91	0.91
tblVehicleEF	MHD	0.09	2.4000e-003
tblVehicleEF	MHD	0.10	0.01
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	0.12	0.14
tblVehicleEF	MHD	9.7780e-003	1.7000e-003
tblVehicleEF	MHD	0.08	2.4000e-003
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	2.7180e-003	0.01
tblVehicleEF	MHD	0.11	0.14
tblVehicleEF	MHD	7.7670e-003	1.7000e-003
tblVehicleEF	MHD	0.03	3.0000e-004
tblVehicleEF	MHD	0.87	0.05
tblVehicleEF	MHD	0.32	0.02
tblVehicleEF	MHD	0.02	1.0000e-004
tblVehicleEF	MHD	0.32	0.24
tblVehicleEF	MHD	1.87	0.45
tblVehicleEF	MHD	2.35	1.78
tblVehicleEF	MHD	5.3060e-003	1.0000e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	1.2710e-003	6.0000e-004
tblVehicleEF	MHD	0.03	3.0000e-004
tblVehicleEF	MHD	0.87	0.05
tblVehicleEF	MHD	0.36	0.02
tblVehicleEF	MHD	0.02	1.0000e-004
tblVehicleEF	MHD	0.36	0.26

tblVehicleEF	MHD	1.87	0.45
tblVehicleEF	MHD	2.52	1.92
tblVehicleEF	OBUS	0.02	1.3000e-003
tblVehicleEF	OBUS	2.9480e-003	0.02
tblVehicleEF	OBUS	0.00	0.05
tblVehicleEF	OBUS	2.24	0.18
tblVehicleEF	OBUS	2.13	3.58
tblVehicleEF	OBUS	14.81	15.02
tblVehicleEF	OBUS	3.9530e-003	1.7350e-003
tblVehicleEF	OBUS	6.46	0.12
tblVehicleEF	OBUS	4.62	3.64
tblVehicleEF	OBUS	1.77	1.81
tblVehicleEF	OBUS	0.02	1.3000e-003
tblVehicleEF	OBUS	0.09	0.01
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	0.06	0.11
tblVehicleEF	OBUS	2.3860e-003	2.3000e-003
tblVehicleEF	OBUS	0.02	1.3000e-003
tblVehicleEF	OBUS	0.04	0.01
tblVehicleEF	OBUS	2.5450e-003	0.01
tblVehicleEF	OBUS	0.05	0.11
tblVehicleEF	OBUS	1.8930e-003	2.3000e-003
tblVehicleEF	OBUS	1.4710e-003	6.0000e-004
tblVehicleEF	OBUS	0.04	0.02
tblVehicleEF	OBUS	0.40	0.03
tblVehicleEF	OBUS	5.9200e-004	2.0000e-004
tblVehicleEF	OBUS	0.21	0.23
tblVehicleEF	OBUS	0.46	0.23

tblVehicleEF	OBUS	1.18	0.97
tblVehicleEF	OBUS	5.6380e-003	1.0000e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	6.9500e-004	5.0000e-004
tblVehicleEF	OBUS	1.4710e-003	6.0000e-004
tblVehicleEF	OBUS	0.04	0.02
tblVehicleEF	OBUS	0.45	0.03
tblVehicleEF	OBUS	5.9200e-004	2.0000e-004
tblVehicleEF	OBUS	0.25	0.26
tblVehicleEF	OBUS	0.46	0.23
tblVehicleEF	OBUS	1.27	1.03
tblVehicleEF	OBUS	0.02	1.3000e-003
tblVehicleEF	OBUS	2.9480e-003	0.02
tblVehicleEF	OBUS	0.00	0.04
tblVehicleEF	OBUS	1.63	0.18
tblVehicleEF	OBUS	2.12	3.66
tblVehicleEF	OBUS	10.93	9.17
tblVehicleEF	OBUS	3.9530e-003	1.7350e-003
tblVehicleEF	OBUS	6.67	0.12
tblVehicleEF	OBUS	4.37	3.40
tblVehicleEF	OBUS	1.65	1.64
tblVehicleEF	OBUS	0.02	1.3000e-003
tblVehicleEF	OBUS	0.09	0.01
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	0.06	0.11
tblVehicleEF	OBUS	2.3860e-003	2.3000e-003
tblVehicleEF	OBUS	0.02	1.3000e-003
tblVehicleEF	OBUS	0.04	0.01

tblVehicleEF	OBUS	2.5450e-003	0.01
tblVehicleEF	OBUS	0.05	0.11
tblVehicleEF	OBUS	1.8930e-003	2.3000e-003
tblVehicleEF	OBUS	3.1470e-003	2.0000e-003
tblVehicleEF	OBUS	0.05	0.02
tblVehicleEF	OBUS	0.37	0.03
tblVehicleEF	OBUS	8.9000e-004	6.0000e-004
tblVehicleEF	OBUS	0.21	0.23
tblVehicleEF	OBUS	0.45	0.22
tblVehicleEF	OBUS	0.91	0.69
tblVehicleEF	OBUS	5.9730e-003	1.0000e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	6.2600e-004	4.0000e-004
tblVehicleEF	OBUS	3.1470e-003	2.0000e-003
tblVehicleEF	OBUS	0.05	0.02
tblVehicleEF	OBUS	0.43	0.03
tblVehicleEF	OBUS	8.9000e-004	6.0000e-004
tblVehicleEF	OBUS	0.25	0.27
tblVehicleEF	OBUS	0.45	0.22
tblVehicleEF	OBUS	0.98	0.74
tblVehicleEF	OBUS	0.02	1.3000e-003
tblVehicleEF	OBUS	2.9480e-003	0.02
tblVehicleEF	OBUS	0.00	0.06
tblVehicleEF	OBUS	3.09	0.18
tblVehicleEF	OBUS	2.13	3.56
tblVehicleEF	OBUS	10.94	17.94
tblVehicleEF	OBUS	3.9530e-003	1.7350e-003
tblVehicleEF	OBUS	6.17	0.12

tblVehicleEF	OBUS	4.46	3.77
tblVehicleEF	OBUS	1.65	1.90
tblVehicleEF	OBUS	0.03	1.3000e-003
tblVehicleEF	OBUS	0.09	0.01
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	0.06	0.11
tblVehicleEF	OBUS	2.3860e-003	2.3000e-003
tblVehicleEF	OBUS	0.02	1.3000e-003
tblVehicleEF	OBUS	0.04	0.01
tblVehicleEF	OBUS	2.5450e-003	0.01
tblVehicleEF	OBUS	0.05	0.11
tblVehicleEF	OBUS	1.8930e-003	2.3000e-003
tblVehicleEF	OBUS	4.7640e-003	2.0000e-004
tblVehicleEF	OBUS	0.09	0.02
tblVehicleEF	OBUS	0.43	0.03
tblVehicleEF	OBUS	1.9520e-003	1.0000e-004
tblVehicleEF	OBUS	0.21	0.22
tblVehicleEF	OBUS	0.51	0.24
tblVehicleEF	OBUS	0.92	1.11
tblVehicleEF	OBUS	5.1760e-003	1.0000e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	6.2600e-004	5.0000e-004
tblVehicleEF	OBUS	4.7640e-003	2.0000e-004
tblVehicleEF	OBUS	0.09	0.02
tblVehicleEF	OBUS	0.49	0.03
tblVehicleEF	OBUS	1.9520e-003	1.0000e-004
tblVehicleEF	OBUS	0.25	0.26
tblVehicleEF	OBUS	0.51	0.24

tblVehicleEF	OBUS	0.98	1.19
tblVehicleEF	SBUS	5.4240e-003	0.04
tblVehicleEF	SBUS	7.1220e-003	0.04
tblVehicleEF	SBUS	0.00	0.05
tblVehicleEF	SBUS	1.05	6.93
tblVehicleEF	SBUS	11.09	8.37
tblVehicleEF	SBUS	59.28	13.08
tblVehicleEF	SBUS	1.6690e-003	2.2260e-003
tblVehicleEF	SBUS	8.14	7.87
tblVehicleEF	SBUS	8.51	7.78
tblVehicleEF	SBUS	3.94	0.88
tblVehicleEF	SBUS	0.03	0.11
tblVehicleEF	SBUS	0.53	0.01
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.08	0.31
tblVehicleEF	SBUS	0.01	1.8000e-003
tblVehicleEF	SBUS	0.03	0.11
tblVehicleEF	SBUS	0.23	0.01
tblVehicleEF	SBUS	2.7010e-003	0.01
tblVehicleEF	SBUS	0.08	0.31
tblVehicleEF	SBUS	9.4640e-003	1.8000e-003
tblVehicleEF	SBUS	0.07	8.7000e-003
tblVehicleEF	SBUS	0.46	0.07
tblVehicleEF	SBUS	0.12	1.05
tblVehicleEF	SBUS	0.02	2.2000e-003
tblVehicleEF	SBUS	0.79	0.64
tblVehicleEF	SBUS	3.57	0.08
tblVehicleEF	SBUS	4.55	0.97

tblVehicleEF	SBUS	5.6380e-003	5.5000e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	2.4760e-003	5.0000e-004
tblVehicleEF	SBUS	0.07	8.7000e-003
tblVehicleEF	SBUS	0.46	0.07
tblVehicleEF	SBUS	0.13	1.13
tblVehicleEF	SBUS	0.02	2.2000e-003
tblVehicleEF	SBUS	0.87	0.71
tblVehicleEF	SBUS	3.57	0.08
tblVehicleEF	SBUS	4.88	1.04
tblVehicleEF	SBUS	5.1110e-003	0.04
tblVehicleEF	SBUS	7.1220e-003	0.04
tblVehicleEF	SBUS	0.00	0.04
tblVehicleEF	SBUS	0.77	6.93
tblVehicleEF	SBUS	10.69	8.19
tblVehicleEF	SBUS	45.07	9.02
tblVehicleEF	SBUS	1.6690e-003	2.2260e-003
tblVehicleEF	SBUS	8.40	7.87
tblVehicleEF	SBUS	7.99	7.40
tblVehicleEF	SBUS	3.59	0.78
tblVehicleEF	SBUS	0.02	0.11
tblVehicleEF	SBUS	0.53	0.01
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.08	0.31
tblVehicleEF	SBUS	0.01	1.8000e-003
tblVehicleEF	SBUS	0.02	0.11
tblVehicleEF	SBUS	0.23	0.01
tblVehicleEF	SBUS	2.7010e-003	0.01

tblVehicleEF	SBUS	0.08	0.31
tblVehicleEF	SBUS	9.4640e-003	1.8000e-003
tblVehicleEF	SBUS	0.14	0.02
tblVehicleEF	SBUS	0.51	0.09
tblVehicleEF	SBUS	0.11	1.05
tblVehicleEF	SBUS	0.04	6.8000e-003
tblVehicleEF	SBUS	0.78	0.64
tblVehicleEF	SBUS	3.14	0.07
tblVehicleEF	SBUS	3.59	0.73
tblVehicleEF	SBUS	5.9730e-003	5.5000e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	2.2230e-003	4.0000e-004
tblVehicleEF	SBUS	0.14	0.02
tblVehicleEF	SBUS	0.51	0.09
tblVehicleEF	SBUS	0.13	1.13
tblVehicleEF	SBUS	0.04	6.8000e-003
tblVehicleEF	SBUS	0.86	0.71
tblVehicleEF	SBUS	3.14	0.07
tblVehicleEF	SBUS	3.85	0.78
tblVehicleEF	SBUS	5.8550e-003	0.04
tblVehicleEF	SBUS	7.1220e-003	0.04
tblVehicleEF	SBUS	0.00	0.06
tblVehicleEF	SBUS	1.45	6.93
tblVehicleEF	SBUS	10.75	8.60
tblVehicleEF	SBUS	45.53	15.34
tblVehicleEF	SBUS	1.6690e-003	2.2260e-003
tblVehicleEF	SBUS	7.78	7.87
tblVehicleEF	SBUS	8.18	8.01

tblVehicleEF	SBUS	3.62	0.94
tblVehicleEF	SBUS	0.03	0.11
tblVehicleEF	SBUS	0.53	0.01
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.08	0.31
tblVehicleEF	SBUS	0.01	1.8000e-003
tblVehicleEF	SBUS	0.03	0.11
tblVehicleEF	SBUS	0.23	0.01
tblVehicleEF	SBUS	2.7010e-003	0.01
tblVehicleEF	SBUS	0.08	0.31
tblVehicleEF	SBUS	9.4640e-003	1.8000e-003
tblVehicleEF	SBUS	0.23	1.6000e-003
tblVehicleEF	SBUS	0.88	0.08
tblVehicleEF	SBUS	0.13	1.05
tblVehicleEF	SBUS	0.08	8.0000e-004
tblVehicleEF	SBUS	0.78	0.64
tblVehicleEF	SBUS	4.31	0.09
tblVehicleEF	SBUS	3.64	1.11
tblVehicleEF	SBUS	5.1750e-003	5.5000e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	2.2310e-003	5.0000e-004
tblVehicleEF	SBUS	0.23	1.6000e-003
tblVehicleEF	SBUS	0.88	0.08
tblVehicleEF	SBUS	0.14	1.13
tblVehicleEF	SBUS	0.08	8.0000e-004
tblVehicleEF	SBUS	0.86	0.71
tblVehicleEF	SBUS	4.31	0.09
tblVehicleEF	SBUS	3.90	1.19

tblVehicleEF	UBUS	0.00	0.03
tblVehicleEF	UBUS	0.00	0.14
tblVehicleEF	UBUS	6.02	6.17
tblVehicleEF	UBUS	27.32	35.83
tblVehicleEF	UBUS	1.1840e-003	1.5730e-003
tblVehicleEF	UBUS	4.05	4.29
tblVehicleEF	UBUS	3.82	4.52
tblVehicleEF	UBUS	0.54	0.01
tblVehicleEF	UBUS	8.0000e-003	0.01
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	9.5100e-004	7.1000e-003
tblVehicleEF	UBUS	0.23	0.01
tblVehicleEF	UBUS	2.0000e-003	0.01
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	8.8200e-004	7.1000e-003
tblVehicleEF	UBUS	0.01	7.4000e-003
tblVehicleEF	UBUS	0.19	0.14
tblVehicleEF	UBUS	6.4420e-003	3.0000e-003
tblVehicleEF	UBUS	0.45	0.48
tblVehicleEF	UBUS	0.92	0.03
tblVehicleEF	UBUS	2.02	2.54
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	1.0500e-003	1.4000e-003
tblVehicleEF	UBUS	0.01	7.4000e-003
tblVehicleEF	UBUS	0.19	0.14
tblVehicleEF	UBUS	6.4420e-003	3.0000e-003
tblVehicleEF	UBUS	0.51	0.54
tblVehicleEF	UBUS	0.92	0.03

tblVehicleEF	UBUS	2.16	2.71
tblVehicleEF	UBUS	0.00	0.04
tblVehicleEF	UBUS	0.00	0.11
tblVehicleEF	UBUS	6.20	6.45
tblVehicleEF	UBUS	20.27	23.17
tblVehicleEF	UBUS	1.1840e-003	1.5730e-003
tblVehicleEF	UBUS	3.70	3.91
tblVehicleEF	UBUS	3.54	4.04
tblVehicleEF	UBUS	0.54	0.01
tblVehicleEF	UBUS	8.0000e-003	0.01
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	9.5100e-004	7.1000e-003
tblVehicleEF	UBUS	0.23	0.01
tblVehicleEF	UBUS	2.0000e-003	0.01
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	8.8200e-004	7.1000e-003
tblVehicleEF	UBUS	0.03	0.02
tblVehicleEF	UBUS	0.22	0.19
tblVehicleEF	UBUS	0.01	9.5000e-003
tblVehicleEF	UBUS	0.47	0.50
tblVehicleEF	UBUS	0.84	0.02
tblVehicleEF	UBUS	1.71	2.00
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	9.3000e-004	1.2000e-003
tblVehicleEF	UBUS	0.03	0.02
tblVehicleEF	UBUS	0.22	0.19
tblVehicleEF	UBUS	0.01	9.5000e-003
tblVehicleEF	UBUS	0.52	0.56

tblVehicleEF	UBUS	0.84	0.02
tblVehicleEF	UBUS	1.83	2.13
tblVehicleEF	UBUS	0.00	0.03
tblVehicleEF	UBUS	0.00	0.15
tblVehicleEF	UBUS	6.20	6.03
tblVehicleEF	UBUS	20.35	42.00
tblVehicleEF	UBUS	1.1840e-003	1.5730e-003
tblVehicleEF	UBUS	3.80	4.49
tblVehicleEF	UBUS	3.54	4.77
tblVehicleEF	UBUS	0.54	0.01
tblVehicleEF	UBUS	8.0000e-003	0.01
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	9.5100e-004	7.1000e-003
tblVehicleEF	UBUS	0.23	0.01
tblVehicleEF	UBUS	2.0000e-003	0.01
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	8.8200e-004	7.1000e-003
tblVehicleEF	UBUS	0.04	1.8000e-003
tblVehicleEF	UBUS	0.42	0.14
tblVehicleEF	UBUS	0.02	1.2000e-003
tblVehicleEF	UBUS	0.47	0.47
tblVehicleEF	UBUS	1.22	0.03
tblVehicleEF	UBUS	1.72	2.81
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	9.3200e-004	1.5000e-003
tblVehicleEF	UBUS	0.04	1.8000e-003
tblVehicleEF	UBUS	0.42	0.14
tblVehicleEF	UBUS	0.02	1.2000e-003

tblVehicleEF	UBUS	0.52	0.53
tblVehicleEF	UBUS	1.22	0.03
tblVehicleEF	UBUS	1.83	3.00
tblWater	AerobicPercent	87.46	84.69
tblWater	AnaDigestCombDigestGasPercent	100.00	3.17
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	2.14
tblWater	SepticTankPercent	10.33	10.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2014	3.5313	40.0142	21.8084	0.0387	132.8495	1.7148	134.5643	13.9654	1.5776	15.5430			3,703.0217	1.0788	0.0000	3,725.6770
2015	2.6819	30.9101	17.6597	0.0282	11.5819	1.2791	12.8610	4.3361	1.1767	5.5129			2,680.9606	0.7992	0.0000	2,697.7443
2016	2.5112	28.4513	16.6049	0.0281	11.5819	1.1721	12.7541	4.3361	1.0784	5.4145			2,649.9707	0.7982	0.0000	2,666.7318
2017	2.3509	26.1873	15.5080	0.0280	11.5658	1.0714	12.6372	4.3345	0.9857	5.3202			2,597.4166	0.7947	0.0000	2,614.1042
Total	**11.0752**	**125.5628**	**71.5810**	**0.1230**	**167.5792**	**5.2374**	**172.8165**	**26.9722**	**4.8184**	**31.7906**			**11,631.3696**	**3.4708**	**0.0000**	**11,704.2574**

2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2014	3.5313	40.0142	21.8084	0.0387	80.3777	1.7148	82.0926	8.0601	1.5776	9.6377			3,703.0174	1.0788	0.0000	3,725.6726
2015	2.6819	30.9100	17.6597	0.0282	4.6635	1.2791	5.9426	0.6799	1.1767	1.8566			2,680.9574	0.7992	0.0000	2,697.7411
2016	2.5112	28.4512	16.6048	0.0281	4.6635	1.1721	5.8356	0.6799	1.0784	1.7583			2,649.9676	0.7982	0.0000	2,666.7287
2017	2.3509	26.1872	15.5080	0.0280	4.6475	1.0714	5.7189	0.6783	0.9857	1.6640			2,597.4135	0.7947	0.0000	2,614.1011
Total	**11.0752**	**125.5626**	**71.5809**	**0.1230**	**94.3523**	**5.2374**	**99.5897**	**10.0982**	**4.8184**	**14.9166**			**11,631.3559**	**3.4708**	**0.0000**	**11,704.2436**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**43.70**	**0.00**	**42.37**	**62.56**	**0.00**	**53.08**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000			2.0000e-005	0.0000	0.0000	2.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**			**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000			2.0000e-005	0.0000	0.0000	2.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**			**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.3 Vegetation

Vegetation

	CO2e
Category	MT
Vegetation Land Change	836.1400
Total	**836.1400**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site preparation	Site Preparation	2/1/2014	2/7/2014	5	5	
2	Distribute straw bales on sand dunes	Site Preparation	2/8/2014	8/8/2014	5	130	
3	Planting and watering	Site Preparation	8/9/2014	11/28/2014	5	80	
4	Clean up and restoration	Site Preparation	11/29/2014	12/12/2014	5	10	
5	Operation and maintenance	Site Preparation	1/1/2015	12/31/2017	5	782	
6	ATVs	Site Preparation	1/1/2015	12/31/2017	5	782	
7	Water Trucks	Site Preparation	1/1/2015	12/31/2017	5	782	

Acres of Grading (Site Preparation Phase): 5.6

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site preparation	Graders	2	8.00	162	0.61
Site preparation	Off-Highway Trucks	4	8.00	381	0.57
Site preparation	Rubber Tired Dozers	0	8.00	358	0.59
Site preparation	Tractors/Loaders/Backhoes	0	8.00	75	0.55
Distribute straw bales on sand dunes	Cranes	0	7.00	208	0.43
Distribute straw bales on sand dunes	Forklifts	0	8.00	149	0.30
Distribute straw bales on sand dunes	Generator Sets	0	8.00	84	0.74
Distribute straw bales on sand dunes	Off-Highway Trucks	6	8.00	381	0.57
Distribute straw bales on sand dunes	Rubber Tired Dozers	2	8.00	358	0.59
Distribute straw bales on sand dunes	Rubber Tired Loaders	2	8.00	87	0.54
Distribute straw bales on sand dunes	Tractors/Loaders/Backhoes	2	8.00	75	0.55
Distribute straw bales on sand dunes	Welders	0	8.00	46	0.45
Planting and watering	Cranes	0	7.00	208	0.43
Planting and watering	Forklifts	0	8.00	149	0.30
Planting and watering	Generator Sets	0	8.00	84	0.74
Planting and watering	Off-Highway Trucks	30	8.00	381	0.57
Planting and watering	Rubber Tired Dozers	3	8.00	358	0.59
Planting and watering	Rubber Tired Loaders	2	8.00	87	0.54
Planting and watering	Tractors/Loaders/Backhoes	5	8.00	75	0.55
Planting and watering	Welders	0	8.00	46	0.45
Clean up and restoration	Off-Highway Trucks	7	8.00	381	0.57
Clean up and restoration	Rubber Tired Dozers	2	8.00	358	0.59
Clean up and restoration	Rubber Tired Loaders	2	8.00	87	0.54
Clean up and restoration	Tractors/Loaders/Backhoes	2	8.00	75	0.55

Operation and maintenance	Cranes	0	7.00	208	0.43
Operation and maintenance	Forklifts	0	8.00	149	0.30
Operation and maintenance	Generator Sets	0	8.00	84	0.74
Operation and maintenance	Off-Highway Trucks	5	8.00	381	0.57
Operation and maintenance	Rubber Tired Dozers	3	8.00	358	0.59
Operation and maintenance	Rubber Tired Loaders	0	8.00	87	0.54
Operation and maintenance	Tractors/Loaders/Backhoes	0	8.00	75	0.55
Operation and maintenance	Welders	0	8.00	46	0.45
ATVs	Off-Highway Trucks	10	8.00	50	0.38
ATVs	Rubber Tired Dozers	0	8.00	255	0.40
ATVs	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Water Trucks	Off-Highway Trucks	5	8.00	400	0.38
Water Trucks	Rubber Tired Dozers	0	8.00	255	0.40
Water Trucks	Tractors/Loaders/Backhoes	0	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site preparation	6	15.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Distribute straw bales on sand dunes	12	30.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Planting and watering	40	100.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Clean up and restoration	13	33.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Operation and maintenance	8	5.00	0.00	0.00	2.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
ATVs	10	11.25	0.00	0.00	2.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Water Trucks	5	6.00	0.00	0.00	2.20	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Site preparation - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.9700e-003	0.0000	2.9700e-003	3.2000e-004	0.0000	3.2000e-004			0.0000	0.0000	0.0000	0.0000
Off-Road	0.0225	0.2553	0.1139	2.3000e-004		0.0111	0.0111		0.0102	0.0102			22.2781	6.5800e-003	0.0000	22.4164
Total	**0.0225**	**0.2553**	**0.1139**	**2.3000e-004**	**2.9700e-003**	**0.0111**	**0.0141**	**3.2000e-004**	**0.0102**	**0.0106**			**22.2781**	**6.5800e-003**	**0.0000**	**22.4164**

3.2 Site preparation - 2014

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	4.4000e-004	6.7000e-004	6.6000e-003	1.0000e-005	0.7989	1.0000e-005	0.7989	0.0797	1.0000e-005	0.0797			0.4627	4.0000e-005	0.0000	0.4636
Total	**4.4000e-004**	**6.7000e-004**	**6.6000e-003**	**1.0000e-005**	**0.7989**	**1.0000e-005**	**0.7989**	**0.0797**	**1.0000e-005**	**0.0797**			**0.4627**	**4.0000e-005**	**0.0000**	**0.4636**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.0000e-004	0.0000	2.0000e-004	2.0000e-005	0.0000	2.0000e-005			0.0000	0.0000	0.0000	0.0000
Off-Road	0.0225	0.2553	0.1139	2.3000e-004		0.0111	0.0111		0.0102	0.0102			22.2781	6.5800e-003	0.0000	22.4164
Total	**0.0225**	**0.2553**	**0.1139**	**2.3000e-004**	**2.0000e-004**	**0.0111**	**0.0113**	**2.0000e-005**	**0.0102**	**0.0103**			**22.2781**	**6.5800e-003**	**0.0000**	**22.4164**

3.2 Site preparation - 2014

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	4.4000e-004	6.7000e-004	6.6000e-003	1.0000e-005	0.4892	1.0000e-005	0.4892	0.0488	1.0000e-005	0.0488			0.4627	4.0000e-005	0.0000	0.4636
Total	**4.4000e-004**	**6.7000e-004**	**6.6000e-003**	**1.0000e-005**	**0.4892**	**1.0000e-005**	**0.4892**	**0.0488**	**1.0000e-005**	**0.0488**			**0.4627**	**4.0000e-005**	**0.0000**	**0.4636**

3.3 Distribute straw bales on sand dunes - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.8857	0.0000	0.8857	0.4414	0.0000	0.4414			0.0000	0.0000	0.0000	0.0000
Off-Road	1.0788	12.1978	6.9070	0.0107		0.5583	0.5583		0.5136	0.5136			1,031.3280	0.3048	0.0000	1,037.7281
Total	**1.0788**	**12.1978**	**6.9070**	**0.0107**	**0.8857**	**0.5583**	**1.4440**	**0.4414**	**0.5136**	**0.9551**			**1,031.3280**	**0.3048**	**0.0000**	**1,037.7281**

3.3 Distribute straw bales on sand dunes - 2014

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	0.0231	0.0346	0.3432	3.0000e-004	41.5425	3.3000e-004	41.5429	4.1462	3.0000e-004	4.1465			24.0594	2.2100e-003	0.0000	24.1058
Total	**0.0231**	**0.0346**	**0.3432**	**3.0000e-004**	**41.5425**	**3.3000e-004**	**41.5429**	**4.1462**	**3.0000e-004**	**4.1465**			**24.0594**	**2.2100e-003**	**0.0000**	**24.1058**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0598	0.0000	0.0598	0.0298	0.0000	0.0298			0.0000	0.0000	0.0000	0.0000
Off-Road	1.0788	12.1978	6.9070	0.0107		0.5583	0.5583		0.5136	0.5136			1,031.3268	0.3048	0.0000	1,037.7269
Total	**1.0788**	**12.1978**	**6.9070**	**0.0107**	**0.0598**	**0.5583**	**0.6181**	**0.0298**	**0.5136**	**0.5434**			**1,031.3268**	**0.3048**	**0.0000**	**1,037.7269**

3.3 Distribute straw bales on sand dunes - 2014

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	0.0231	0.0346	0.3432	3.0000e-004	25.4372	3.3000e-004	25.4376	2.5357	3.0000e-004	2.5360			24.0594	2.2100e-003	0.0000	24.1058
Total	**0.0231**	**0.0346**	**0.3432**	**3.0000e-004**	**25.4372**	**3.3000e-004**	**25.4376**	**2.5357**	**3.0000e-004**	**2.5360**			**24.0594**	**2.2100e-003**	**0.0000**	**24.1058**

3.4 Planting and watering - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.8255	0.0000	0.8255	0.4083	0.0000	0.4083			0.0000	0.0000	0.0000	0.0000
Off-Road	2.2667	26.4239	13.1337	0.0258		1.0980	1.0980		1.0101	1.0101			2,485.1195	0.7344	0.0000	2,500.5415
Total	**2.2667**	**26.4239**	**13.1337**	**0.0258**	**0.8255**	**1.0980**	**1.9235**	**0.4083**	**1.0101**	**1.4185**			**2,485.1195**	**0.7344**	**0.0000**	**2,500.5415**

3.4 Planting and watering - 2014

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	0.0474	0.0710	0.7039	6.2000e-004	85.2155	6.9000e-004	85.2162	8.5051	6.2000e-004	8.5057			49.3526	4.5300e-003	0.0000	49.4478
Total	**0.0474**	**0.0710**	**0.7039**	**6.2000e-004**	**85.2155**	**6.9000e-004**	**85.2162**	**8.5051**	**6.2000e-004**	**8.5057**			**49.3526**	**4.5300e-003**	**0.0000**	**49.4478**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0557	0.0000	0.0557	0.0276	0.0000	0.0276			0.0000	0.0000	0.0000	0.0000
Off-Road	2.2667	26.4239	13.1337	0.0258		1.0980	1.0980		1.0101	1.0101			2,485.116 6	0.7344	0.0000	2,500.538 5
Total	**2.2667**	**26.4239**	**13.1337**	**0.0258**	**0.0557**	**1.0980**	**1.1537**	**0.0276**	**1.0101**	**1.0377**			**2,485.116 6**	**0.7344**	**0.0000**	**2,500.538 5**

3.4 Planting and watering - 2014

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	0.0474	0.0710	0.7039	6.2000e-004	52.1790	6.9000e-004	52.1796	5.2014	6.2000e-004	5.2021			49.3526	4.5300e-003	0.0000	49.4478
Total	**0.0474**	**0.0710**	**0.7039**	**6.2000e-004**	**52.1790**	**6.9000e-004**	**52.1796**	**5.2014**	**6.2000e-004**	**5.2021**			**49.3526**	**4.5300e-003**	**0.0000**	**49.4478**

3.5 Clean up and restoration - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0632	0.0000	0.0632	0.0334	0.0000	0.0334			0.0000	0.0000	0.0000	0.0000
Off-Road	0.0905	1.0280	0.5711	9.2000e-004		0.0464	0.0464		0.0427	0.0427			88.3856	0.0261	0.0000	88.9341
Total	**0.0905**	**1.0280**	**0.5711**	**9.2000e-004**	**0.0632**	**0.0464**	**0.1096**	**0.0334**	**0.0427**	**0.0761**			**88.3856**	**0.0261**	**0.0000**	**88.9341**

3.5 Clean up and restoration - 2014

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	1.9500e-003	2.9300e-003	0.0290	3.0000e-005	3.5151	3.0000e-005	3.5152	0.3508	3.0000e-005	0.3509			2.0358	1.9000e-004	0.0000	2.0397
Total	**1.9500e-003**	**2.9300e-003**	**0.0290**	**3.0000e-005**	**3.5151**	**3.0000e-005**	**3.5152**	**0.3508**	**3.0000e-005**	**0.3509**			**2.0358**	**1.9000e-004**	**0.0000**	**2.0397**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					4.2700e-003	0.0000	4.2700e-003	2.2600e-003	0.0000	2.2600e-003			0.0000	0.0000	0.0000	0.0000
Off-Road	0.0905	1.0280	0.5711	9.2000e-004		0.0464	0.0464		0.0427	0.0427			88.3855	0.0261	0.0000	88.9340
Total	**0.0905**	**1.0280**	**0.5711**	**9.2000e-004**	**4.2700e-003**	**0.0464**	**0.0507**	**2.2600e-003**	**0.0427**	**0.0449**			**88.3855**	**0.0261**	**0.0000**	**88.9340**

3.5 Clean up and restoration - 2014

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	1.9500e-003	2.9300e-003	0.0290	3.0000e-005	2.1524	3.0000e-005	2.1524	0.2146	3.0000e-005	0.2146			2.0358	1.9000e-004	0.0000	2.0397
Total	**1.9500e-003**	**2.9300e-003**	**0.0290**	**3.0000e-005**	**2.1524**	**3.0000e-005**	**2.1524**	**0.2146**	**3.0000e-005**	**0.2146**			**2.0358**	**1.9000e-004**	**0.0000**	**2.0397**

3.6 Operation and maintenance - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.1668	0.0000	7.1668	3.8940	0.0000	3.8940			0.0000	0.0000	0.0000	0.0000
Off-Road	1.9930	22.9801	13.9889	0.0195		0.9764	0.9764		0.8983	0.8983			1,856.4194	0.5542	0.0000	1,868.0580
Total	**1.9930**	**22.9801**	**13.9889**	**0.0195**	**7.1668**	**0.9764**	**8.1432**	**3.8940**	**0.8983**	**4.7923**			**1,856.4194**	**0.5542**	**0.0000**	**1,868.0580**

3.6 Operation and maintenance - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	3.6900e-003	2.2300e-003	0.0252	2.0000e-005	1.1948	2.0000e-005	1.1949	0.1191	2.0000e-005	0.1192			1.4132	1.5000e-004	0.0000	1.4163
Total	**3.6900e-003**	**2.2300e-003**	**0.0252**	**2.0000e-005**	**1.1948**	**2.0000e-005**	**1.1949**	**0.1191**	**2.0000e-005**	**0.1192**			**1.4132**	**1.5000e-004**	**0.0000**	**1.4163**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4838	0.0000	0.4838	0.2629	0.0000	0.2629			0.0000	0.0000	0.0000	0.0000
Off-Road	1.9930	22.9801	13.9889	0.0195		0.9764	0.9764		0.8983	0.8983			1,856.4172	0.5542	0.0000	1,868.0558
Total	**1.9930**	**22.9801**	**13.9889**	**0.0195**	**0.4838**	**0.9764**	**1.4602**	**0.2629**	**0.8983**	**1.1612**			**1,856.4172**	**0.5542**	**0.0000**	**1,868.0558**

3.6 Operation and maintenance - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	3.6900e-003	2.2300e-003	0.0252	2.0000e-005	1.1948	2.0000e-005	1.1949	0.1191	2.0000e-005	0.1192			1.4132	1.5000e-004	0.0000	1.4163
Total	**3.6900e-003**	**2.2300e-003**	**0.0252**	**2.0000e-005**	**1.1948**	**2.0000e-005**	**1.1949**	**0.1191**	**2.0000e-005**	**0.1192**			**1.4132**	**1.5000e-004**	**0.0000**	**1.4163**

3.6 Operation and maintenance - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.1668	0.0000	7.1668	3.8940	0.0000	3.8940			0.0000	0.0000	0.0000	0.0000
Off-Road	1.8820	21.3619	13.2119	0.0195		0.9049	0.9049		0.8325	0.8325			1,835.1360	0.5535	0.0000	1,846.7603
Total	**1.8820**	**21.3619**	**13.2119**	**0.0195**	**7.1668**	**0.9049**	**8.0717**	**3.8940**	**0.8325**	**4.7265**			**1,835.1360**	**0.5535**	**0.0000**	**1,846.7603**

3.6 Operation and maintenance - 2016

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	3.3100e-003	1.9800e-003	0.0222	2.0000e-005	1.1948	2.0000e-005	1.1949	0.1191	2.0000e-005	0.1192			1.3623	1.3000e-004	0.0000	1.3651
Total	**3.3100e-003**	**1.9800e-003**	**0.0222**	**2.0000e-005**	**1.1948**	**2.0000e-005**	**1.1949**	**0.1191**	**2.0000e-005**	**0.1192**			**1.3623**	**1.3000e-004**	**0.0000**	**1.3651**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4838	0.0000	0.4838	0.2629	0.0000	0.2629			0.0000	0.0000	0.0000	0.0000
Off-Road	1.8820	21.3619	13.2119	0.0195		0.9049	0.9049		0.8325	0.8325			1,835.1338	0.5535	0.0000	1,846.7581
Total	**1.8820**	**21.3619**	**13.2119**	**0.0195**	**0.4838**	**0.9049**	**1.3887**	**0.2629**	**0.8325**	**1.0954**			**1,835.1338**	**0.5535**	**0.0000**	**1,846.7581**

3.6 Operation and maintenance - 2016

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	3.3100e-003	1.9800e-003	0.0222	2.0000e-005	1.1948	2.0000e-005	1.1949	0.1191	2.0000e-005	0.1192			1.3623	1.3000e-004	0.0000	1.3651
Total	**3.3100e-003**	**1.9800e-003**	**0.0222**	**2.0000e-005**	**1.1948**	**2.0000e-005**	**1.1949**	**0.1191**	**2.0000e-005**	**0.1192**			**1.3623**	**1.3000e-004**	**0.0000**	**1.3651**

3.6 Operation and maintenance - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.1668	0.0000	7.1668	3.8940	0.0000	3.8940			0.0000	0.0000	0.0000	0.0000
Off-Road	1.7711	19.7875	12.3793	0.0194		0.8340	0.8340		0.7673	0.7673			1,799.2450	0.5513	0.0000	1,810.8220
Total	**1.7711**	**19.7875**	**12.3793**	**0.0194**	**7.1668**	**0.8340**	**8.0008**	**3.8940**	**0.7673**	**4.6613**			**1,799.2450**	**0.5513**	**0.0000**	**1,810.8220**

3.6 Operation and maintenance - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	2.9300e-003	1.7400e-003	0.0194	2.0000e-005	1.1903	2.0000e-005	1.1903	0.1187	2.0000e-005	0.1187			1.3037	1.2000e-004	0.0000	1.3062
Total	**2.9300e-003**	**1.7400e-003**	**0.0194**	**2.0000e-005**	**1.1903**	**2.0000e-005**	**1.1903**	**0.1187**	**2.0000e-005**	**0.1187**			**1.3037**	**1.2000e-004**	**0.0000**	**1.3062**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4838	0.0000	0.4838	0.2629	0.0000	0.2629			0.0000	0.0000	0.0000	0.0000
Off-Road	1.7711	19.7875	12.3793	0.0194		0.8340	0.8340		0.7673	0.7673			1,799.2429	0.5513	0.0000	1,810.8199
Total	**1.7711**	**19.7875**	**12.3793**	**0.0194**	**0.4838**	**0.8340**	**1.3177**	**0.2629**	**0.7673**	**1.0301**			**1,799.2429**	**0.5513**	**0.0000**	**1,810.8199**

3.6 Operation and maintenance - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	2.9300e-003	1.7400e-003	0.0194	2.0000e-005	1.1903	2.0000e-005	1.1903	0.1187	2.0000e-005	0.1187			1.3037	1.2000e-004	0.0000	1.3062
Total	**2.9300e-003**	**1.7400e-003**	**0.0194**	**2.0000e-005**	**1.1903**	**2.0000e-005**	**1.1903**	**0.1187**	**2.0000e-005**	**0.1187**			**1.3037**	**1.2000e-004**	**0.0000**	**1.3062**

3.7 ATVs - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1029	0.0000	0.1029	0.0111	0.0000	0.0111			0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.1029**	**0.0000**	**0.1029**	**0.0111**	**0.0000**	**0.0111**			**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.7 ATVs - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	8.3100e-003	5.0300e-003	0.0566	4.0000e-005	2.6884	5.0000e-005	2.6885	0.2681	5.0000e-005	0.2681			3.1797	3.3000e-004	0.0000	3.1866
Total	**8.3100e-003**	**5.0300e-003**	**0.0566**	**4.0000e-005**	**2.6884**	**5.0000e-005**	**2.6885**	**0.2681**	**5.0000e-005**	**0.2681**			**3.1797**	**3.3000e-004**	**0.0000**	**3.1866**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					6.9400e-003	0.0000	6.9400e-003	7.5000e-004	0.0000	7.5000e-004			0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**6.9400e-003**	**0.0000**	**6.9400e-003**	**7.5000e-004**	**0.0000**	**7.5000e-004**			**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.7 ATVs - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	8.3100e-003	5.0300e-003	0.0566	4.0000e-005	2.6884	5.0000e-005	2.6885	0.2681	5.0000e-005	0.2681			3.1797	3.3000e-004	0.0000	3.1866
Total	**8.3100e-003**	**5.0300e-003**	**0.0566**	**4.0000e-005**	**2.6884**	**5.0000e-005**	**2.6885**	**0.2681**	**5.0000e-005**	**0.2681**			**3.1797**	**3.3000e-004**	**0.0000**	**3.1866**

3.7 ATVs - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1029	0.0000	0.1029	0.0111	0.0000	0.0111			0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.1029**	**0.0000**	**0.1029**	**0.0111**	**0.0000**	**0.0111**			**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.7 ATVs - 2016

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	7.4400e-003	4.4500e-003	0.0499	4.0000e-005	2.6884	5.0000e-005	2.6885	0.2681	4.0000e-005	0.2681			3.0653	2.9000e-004	0.0000	3.0714
Total	**7.4400e-003**	**4.4500e-003**	**0.0499**	**4.0000e-005**	**2.6884**	**5.0000e-005**	**2.6885**	**0.2681**	**4.0000e-005**	**0.2681**			**3.0653**	**2.9000e-004**	**0.0000**	**3.0714**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					6.9400e-003	0.0000	6.9400e-003	7.5000e-004	0.0000	7.5000e-004			0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**6.9400e-003**	**0.0000**	**6.9400e-003**	**7.5000e-004**	**0.0000**	**7.5000e-004**			**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.7 ATVs - 2016

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	7.4400e-003	4.4500e-003	0.0499	4.0000e-005	2.6884	5.0000e-005	2.6885	0.2681	4.0000e-005	0.2681			3.0653	2.9000e-004	0.0000	3.0714
Total	**7.4400e-003**	**4.4500e-003**	**0.0499**	**4.0000e-005**	**2.6884**	**5.0000e-005**	**2.6885**	**0.2681**	**4.0000e-005**	**0.2681**			**3.0653**	**2.9000e-004**	**0.0000**	**3.0714**

3.7 ATVs - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1029	0.0000	0.1029	0.0111	0.0000	0.0111			0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.1029**	**0.0000**	**0.1029**	**0.0111**	**0.0000**	**0.0111**			**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.7 ATVs - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	6.5900e-003	3.9200e-003	0.0435	4.0000e-005	2.6781	5.0000e-005	2.6781	0.2671	4.0000e-005	0.2671			2.9334	2.6000e-004	0.0000	2.9388
Total	**6.5900e-003**	**3.9200e-003**	**0.0435**	**4.0000e-005**	**2.6781**	**5.0000e-005**	**2.6781**	**0.2671**	**4.0000e-005**	**0.2671**			**2.9334**	**2.6000e-004**	**0.0000**	**2.9388**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					6.9400e-003	0.0000	6.9400e-003	7.5000e-004	0.0000	7.5000e-004			0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**6.9400e-003**	**0.0000**	**6.9400e-003**	**7.5000e-004**	**0.0000**	**7.5000e-004**			**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.7 ATVs - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	6.5900e-003	3.9200e-003	0.0435	4.0000e-005	2.6781	5.0000e-005	2.6781	0.2671	4.0000e-005	0.2671			2.9334	2.6000e-004	0.0000	2.9388
Total	**6.5900e-003**	**3.9200e-003**	**0.0435**	**4.0000e-005**	**2.6781**	**5.0000e-005**	**2.6781**	**0.2671**	**4.0000e-005**	**0.2671**			**2.9334**	**2.6000e-004**	**0.0000**	**2.9388**

3.8 Water Trucks - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1029	0.0000	0.1029	0.0111	0.0000	0.0111			0.0000	0.0000	0.0000	0.0000
Off-Road	0.6725	7.9204	3.5627	8.6000e-003		0.3025	0.3025		0.2783	0.2783			818.5792	0.2444	0.0000	823.7112
Total	**0.6725**	**7.9204**	**3.5627**	**8.6000e-003**	**0.1029**	**0.3025**	**0.4054**	**0.0111**	**0.2783**	**0.2894**			**818.5792**	**0.2444**	**0.0000**	**823.7112**

3.8 Water Trucks - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	4.2800e-003	2.2700e-003	0.0264	2.0000e-005	0.3262	2.0000e-005	0.3262	0.0327	2.0000e-005	0.0327			1.3691	1.5000e-004	0.0000	1.3723
Total	**4.2800e-003**	**2.2700e-003**	**0.0264**	**2.0000e-005**	**0.3262**	**2.0000e-005**	**0.3262**	**0.0327**	**2.0000e-005**	**0.0327**			**1.3691**	**1.5000e-004**	**0.0000**	**1.3723**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					6.9400e-003	0.0000	6.9400e-003	7.5000e-004	0.0000	7.5000e-004			0.0000	0.0000	0.0000	0.0000
Off-Road	0.6725	7.9204	3.5627	8.6000e-003		0.3025	0.3025		0.2783	0.2783			818.5783	0.2444	0.0000	823.7103
Total	**0.6725**	**7.9204**	**3.5627**	**8.6000e-003**	**6.9400e-003**	**0.3025**	**0.3095**	**7.5000e-004**	**0.2783**	**0.2791**			**818.5783**	**0.2444**	**0.0000**	**823.7103**

3.8 Water Trucks - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	4.2800e-003	2.2700e-003	0.0264	2.0000e-005	0.2826	2.0000e-005	0.2826	0.0283	2.0000e-005	0.0284			1.3691	1.5000e-004	0.0000	1.3723
Total	**4.2800e-003**	**2.2700e-003**	**0.0264**	**2.0000e-005**	**0.2826**	**2.0000e-005**	**0.2826**	**0.0283**	**2.0000e-005**	**0.0284**			**1.3691**	**1.5000e-004**	**0.0000**	**1.3723**

3.8 Water Trucks - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1029	0.0000	0.1029	0.0111	0.0000	0.0111			0.0000	0.0000	0.0000	0.0000
Off-Road	0.6146	7.0809	3.2977	8.5900e-003		0.2671	0.2671		0.2458	0.2458			809.0873	0.2441	0.0000	814.2123
Total	**0.6146**	**7.0809**	**3.2977**	**8.5900e-003**	**0.1029**	**0.2671**	**0.3700**	**0.0111**	**0.2458**	**0.2569**			**809.0873**	**0.2441**	**0.0000**	**814.2123**

3.8 Water Trucks - 2016

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	3.8400e-003	2.0100e-003	0.0233	2.0000e-005	0.3262	2.0000e-005	0.3262	0.0327	2.0000e-005	0.0327			1.3199	1.3000e-004	0.0000	1.3227
Total	**3.8400e-003**	**2.0100e-003**	**0.0233**	**2.0000e-005**	**0.3262**	**2.0000e-005**	**0.3262**	**0.0327**	**2.0000e-005**	**0.0327**			**1.3199**	**1.3000e-004**	**0.0000**	**1.3227**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					6.9400e-003	0.0000	6.9400e-003	7.5000e-004	0.0000	7.5000e-004			0.0000	0.0000	0.0000	0.0000
Off-Road	0.6146	7.0809	3.2977	8.5900e-003		0.2671	0.2671		0.2458	0.2458			809.0863	0.2441	0.0000	814.2113
Total	**0.6146**	**7.0809**	**3.2977**	**8.5900e-003**	**6.9400e-003**	**0.2671**	**0.2741**	**7.5000e-004**	**0.2458**	**0.2465**			**809.0863**	**0.2441**	**0.0000**	**814.2113**

3.8 Water Trucks - 2016

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	3.8400e-003	2.0100e-003	0.0233	2.0000e-005	0.2826	2.0000e-005	0.2826	0.0283	2.0000e-005	0.0284			1.3199	1.3000e-004	0.0000	1.3227
Total	**3.8400e-003**	**2.0100e-003**	**0.0233**	**2.0000e-005**	**0.2826**	**2.0000e-005**	**0.2826**	**0.0283**	**2.0000e-005**	**0.0284**			**1.3199**	**1.3000e-004**	**0.0000**	**1.3227**

3.8 Water Trucks - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1029	0.0000	0.1029	0.0111	0.0000	0.0111			0.0000	0.0000	0.0000	0.0000
Off-Road	0.5668	6.3923	3.0455	8.5500e-003		0.2373	0.2373		0.2183	0.2183			792.6714	0.2429	0.0000	797.7717
Total	**0.5668**	**6.3923**	**3.0455**	**8.5500e-003**	**0.1029**	**0.2373**	**0.3402**	**0.0111**	**0.2183**	**0.2294**			**792.6714**	**0.2429**	**0.0000**	**797.7717**

3.8 Water Trucks - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	3.4100e-003	1.7700e-003	0.0204	2.0000e-005	0.3249	2.0000e-005	0.3250	0.0326	2.0000e-005	0.0326			1.2631	1.2000e-004	0.0000	1.2656
Total	**3.4100e-003**	**1.7700e-003**	**0.0204**	**2.0000e-005**	**0.3249**	**2.0000e-005**	**0.3250**	**0.0326**	**2.0000e-005**	**0.0326**			**1.2631**	**1.2000e-004**	**0.0000**	**1.2656**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					6.9400e-003	0.0000	6.9400e-003	7.5000e-004	0.0000	7.5000e-004			0.0000	0.0000	0.0000	0.0000
Off-Road	0.5668	6.3923	3.0455	8.5500e-003		0.2373	0.2373		0.2183	0.2183			792.6704	0.2429	0.0000	797.7707
Total	**0.5668**	**6.3923**	**3.0455**	**8.5500e-003**	**6.9400e-003**	**0.2373**	**0.2442**	**7.5000e-004**	**0.2183**	**0.2191**			**792.6704**	**0.2429**	**0.0000**	**797.7707**

3.8 Water Trucks - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Worker	3.4100e-003	1.7700e-003	0.0204	2.0000e-005	0.2815	2.0000e-005	0.2816	0.0282	2.0000e-005	0.0283			1.2631	1.2000e-004	0.0000	1.2656
Total	**3.4100e-003**	**1.7700e-003**	**0.0204**	**2.0000e-005**	**0.2815**	**2.0000e-005**	**0.2816**	**0.0282**	**2.0000e-005**	**0.0283**			**1.2631**	**1.2000e-004**	**0.0000**	**1.2656**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Recreational	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Recreational	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.298929	0.238852	0.201373	0.075588	0.027827	0.015800	0.016059	0.098716	0.001735	0.001573	0.014785	0.002226	0.006537

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**			**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**			**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000			2.0000e-005	0.0000	0.0000	2.0000e-005
Unmitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000			2.0000e-005	0.0000	0.0000	2.0000e-005

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000			2.0000e-005	0.0000	0.0000	2.0000e-005
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**			**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000			2.0000e-005	0.0000	0.0000	2.0000e-005
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**			**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Recreational	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Recreational	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

	Total CO2	CH4	N2O	CO2e
Category	MT			
Unmitigated	836.1400	0.0000	0.0000	836.1400

10.1 Vegetation Land Change

Vegetation Type

	Initial/Final	Total CO2	CH4	N2O	CO2e
	Acres	MT			
Grassland	0 / 194	836.1400	0.0000	0.0000	836.1400
Total		**836.1400**	**0.0000**	**0.0000**	**836.1400**

Keeler Dunes

Inyo County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Recreational	1.00	User Defined Unit	194.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	3.8	**Precipitation Freq (Days)**	34
Climate Zone	9			**Operational Year**	2015
Utility Company	Statewide Average				
CO2 Intensity (lb/MWhr)	958.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.011

1.3 User Entered Comments & Non-Default Data

Project Characteristics - The average wind speed, as recorded at the Bishop Airport Monitoring Station from 1992 to 2002, was approximately 8.4 miles per hour, which is 3.8 m/s.

Land Use - The proposed project site is 194 acres

Construction Phase - User-defined scenario

Off-road Equipment - user-defined

Off-road Equipment - User-defined scenario

Off-road Equipment - User-defined scenario

Off-road Equipment - User-defined scenario

Off-road Equipment - User-defined scenario

Off-road Equipment - User-defined scenario

Off-road Equipment - user-defined

Trips and VMT - User-defined scenario

On-road Fugitive Dust - Assumed 95 percent of travel on unpaved roads

Vehicle Trips - User-defined scenario

Energy Use - User-defined scenario

Construction Off-road Equipment Mitigation - Vehicle speeds limited to 15 mph. Exposed areas watered two times per day.

Grading - User-defined

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	120.00	5.00
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tblConstructionPhase	NumDays	120.00	80.00
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tblConstructionPhase	NumDays	120.00	782.00
tblConstructionPhase	NumDays	120.00	782.00
tblConstructionPhase	NumDays	120.00	782.00
tblConstructionPhase	PhaseEndDate	12/12/2017	12/31/2017
tblConstructionPhase	PhaseEndDate	12/29/2020	12/31/2017
tblConstructionPhase	PhaseEndDate	12/29/2020	12/31/2017

tblConstructionPhase	PhaseStartDate	12/13/2014	1/1/2015
tblConstructionPhase	PhaseStartDate	1/1/2018	1/1/2015
tblConstructionPhase	PhaseStartDate	1/1/2018	1/1/2015
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tblGrading	AcresOfGrading	0.00	194.00
tblGrading	AcresOfGrading	0.00	194.00
tblGrading	AcresOfGrading	0.00	5.60
tblGrading	AcresOfGrading	0.00	194.00
tblGrading	AcresOfGrading	0.00	194.00
tblGrading	AcresOfGrading	0.00	194.00
tblLandUse	LotAcreage	0.00	194.00
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tblOffRoadEquipment	HorsePower	255.00	358.00
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tblOnRoadDust	WorkerPercentPave	100.00	5.00
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tblProjectCharacteristics	CO2IntensityFactor	1001.57	958.49
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tblProjectCharacteristics	OperationalYear	2014	2015
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblProjectCharacteristics	WindSpeed	2.2	3.8
tblTripsAndVMT	WorkerTripLength	16.80	2.80
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tblTripsAndVMT	WorkerTripNumber	13.00	6.00

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tblVehicleEF	LDA	0.09	0.04
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tblVehicleEF	LDA	0.54	0.09
tblVehicleEF	LDA	0.39	0.56
tblVehicleEF	LDA	0.02	0.02

tblVehicleEF	LDA	0.02	0.01
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tblVehicleEF	LDA	0.15	0.17
tblVehicleEF	LDA	0.08	0.09
tblVehicleEF	LDA	0.52	0.09
tblVehicleEF	LDA	0.27	0.34
tblVehicleEF	LDA	3.8450e-003	3.9000e-003
tblVehicleEF	LDA	7.9100e-004	8.0000e-004
tblVehicleEF	LDA	0.24	0.33
tblVehicleEF	LDA	0.27	0.28
tblVehicleEF	LDA	0.15	0.17
tblVehicleEF	LDA	0.10	0.11
tblVehicleEF	LDA	0.52	0.09
tblVehicleEF	LDA	0.28	0.37
tblVehicleEF	LDA	0.02	0.02

tblVehicleEF	LDA	0.02	0.03
tblVehicleEF	LDA	2.20	2.14
tblVehicleEF	LDA	3.00	8.16
tblVehicleEF	LDA	0.31	0.30
tblVehicleEF	LDA	0.19	0.29
tblVehicleEF	LDA	0.25	0.41
tblVehicleEF	LDA	0.04	0.01
tblVehicleEF	LDA	2.7110e-003	0.01
tblVehicleEF	LDA	3.9660e-003	7.0000e-003
tblVehicleEF	LDA	0.02	0.01
tblVehicleEF	LDA	2.0000e-003	8.0000e-003
tblVehicleEF	LDA	2.4660e-003	0.01
tblVehicleEF	LDA	3.6060e-003	7.0000e-003
tblVehicleEF	LDA	0.37	0.01
tblVehicleEF	LDA	0.47	0.21
tblVehicleEF	LDA	0.25	0.01
tblVehicleEF	LDA	0.08	0.08
tblVehicleEF	LDA	0.63	0.10
tblVehicleEF	LDA	0.27	0.61
tblVehicleEF	LDA	3.8290e-003	3.4000e-003
tblVehicleEF	LDA	7.9100e-004	8.0000e-004
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tblVehicleEF	LDA	0.47	0.21
tblVehicleEF	LDA	0.25	0.01
tblVehicleEF	LDA	0.10	0.10
tblVehicleEF	LDA	0.63	0.10
tblVehicleEF	LDA	0.29	0.65
tblVehicleEF	LDT1	0.04	0.05

tblVehicleEF	LDT1	0.05	0.06
tblVehicleEF	LDT1	7.39	7.97
tblVehicleEF	LDT1	11.80	15.55
tblVehicleEF	LDT1	0.12	0.24
tblVehicleEF	LDT1	0.71	0.99
tblVehicleEF	LDT1	0.52	0.67
tblVehicleEF	LDT1	0.04	0.01
tblVehicleEF	LDT1	6.7850e-003	0.01
tblVehicleEF	LDT1	8.8680e-003	0.01
tblVehicleEF	LDT1	0.02	0.01
tblVehicleEF	LDT1	2.0000e-003	8.0000e-003
tblVehicleEF	LDT1	6.0870e-003	0.01
tblVehicleEF	LDT1	7.9660e-003	0.01
tblVehicleEF	LDT1	0.33	0.23
tblVehicleEF	LDT1	0.54	0.44
tblVehicleEF	LDT1	0.24	0.11
tblVehicleEF	LDT1	0.30	0.33
tblVehicleEF	LDT1	1.82	0.38
tblVehicleEF	LDT1	0.92	1.17
tblVehicleEF	LDT1	4.2510e-003	4.3000e-003
tblVehicleEF	LDT1	1.0880e-003	1.1000e-003
tblVehicleEF	LDT1	0.33	0.23
tblVehicleEF	LDT1	0.54	0.44
tblVehicleEF	LDT1	0.24	0.11
tblVehicleEF	LDT1	0.35	0.38
tblVehicleEF	LDT1	1.82	0.38
tblVehicleEF	LDT1	0.99	1.25
tblVehicleEF	LDT1	0.04	0.05

tblVehicleEF	LDT1	0.05	0.04
tblVehicleEF	LDT1	7.77	8.71
tblVehicleEF	LDT1	7.93	9.13
tblVehicleEF	LDT1	0.12	0.24
tblVehicleEF	LDT1	0.61	0.85
tblVehicleEF	LDT1	0.46	0.57
tblVehicleEF	LDT1	0.04	0.01
tblVehicleEF	LDT1	6.7850e-003	0.01
tblVehicleEF	LDT1	8.8680e-003	0.01
tblVehicleEF	LDT1	0.02	0.01
tblVehicleEF	LDT1	2.0000e-003	8.0000e-003
tblVehicleEF	LDT1	6.0870e-003	0.01
tblVehicleEF	LDT1	7.9660e-003	0.01
tblVehicleEF	LDT1	0.70	0.82
tblVehicleEF	LDT1	0.63	0.59
tblVehicleEF	LDT1	0.43	0.43
tblVehicleEF	LDT1	0.30	0.34
tblVehicleEF	LDT1	1.70	0.36
tblVehicleEF	LDT1	0.67	0.75
tblVehicleEF	LDT1	4.5200e-003	4.8000e-003
tblVehicleEF	LDT1	1.0190e-003	1.0000e-003
tblVehicleEF	LDT1	0.70	0.82
tblVehicleEF	LDT1	0.63	0.59
tblVehicleEF	LDT1	0.43	0.43
tblVehicleEF	LDT1	0.35	0.39
tblVehicleEF	LDT1	1.70	0.36
tblVehicleEF	LDT1	0.71	0.80
tblVehicleEF	LDT1	0.04	0.05

tblVehicleEF	LDT1	0.05	0.07
tblVehicleEF	LDT1	7.79	8.14
tblVehicleEF	LDT1	8.05	18.88
tblVehicleEF	LDT1	0.12	0.24
tblVehicleEF	LDT1	0.63	1.09
tblVehicleEF	LDT1	0.46	0.73
tblVehicleEF	LDT1	0.04	0.01
tblVehicleEF	LDT1	6.7850e-003	0.01
tblVehicleEF	LDT1	8.8680e-003	0.01
tblVehicleEF	LDT1	0.02	0.01
tblVehicleEF	LDT1	2.0000e-003	8.0000e-003
tblVehicleEF	LDT1	6.0870e-003	0.01
tblVehicleEF	LDT1	7.9660e-003	0.01
tblVehicleEF	LDT1	1.09	0.04
tblVehicleEF	LDT1	1.17	0.46
tblVehicleEF	LDT1	0.73	0.02
tblVehicleEF	LDT1	0.31	0.34
tblVehicleEF	LDT1	2.29	0.44
tblVehicleEF	LDT1	0.68	1.38
tblVehicleEF	LDT1	4.5030e-003	4.3000e-003
tblVehicleEF	LDT1	1.0220e-003	1.1000e-003
tblVehicleEF	LDT1	1.09	0.04
tblVehicleEF	LDT1	1.17	0.46
tblVehicleEF	LDT1	0.73	0.02
tblVehicleEF	LDT1	0.36	0.39
tblVehicleEF	LDT1	2.29	0.44
tblVehicleEF	LDT1	0.72	1.48
tblVehicleEF	LDT2	0.03	0.03

tblVehicleEF	LDT2	0.03	0.03
tblVehicleEF	LDT2	3.32	3.29
tblVehicleEF	LDT2	6.72	9.01
tblVehicleEF	LDT2	0.18	0.20
tblVehicleEF	LDT2	0.44	0.53
tblVehicleEF	LDT2	0.58	0.73
tblVehicleEF	LDT2	0.04	0.01
tblVehicleEF	LDT2	3.0560e-003	0.02
tblVehicleEF	LDT2	4.3330e-003	0.01
tblVehicleEF	LDT2	0.02	0.01
tblVehicleEF	LDT2	2.0000e-003	8.0000e-003
tblVehicleEF	LDT2	2.7600e-003	0.02
tblVehicleEF	LDT2	3.9230e-003	0.01
tblVehicleEF	LDT2	0.15	0.10
tblVehicleEF	LDT2	0.28	0.21
tblVehicleEF	LDT2	0.11	0.05
tblVehicleEF	LDT2	0.13	0.12
tblVehicleEF	LDT2	0.99	0.18
tblVehicleEF	LDT2	0.52	0.67
tblVehicleEF	LDT2	4.9000e-003	4.3000e-003
tblVehicleEF	LDT2	1.1320e-003	1.0000e-003
tblVehicleEF	LDT2	0.15	0.10
tblVehicleEF	LDT2	0.28	0.21
tblVehicleEF	LDT2	0.11	0.05
tblVehicleEF	LDT2	0.16	0.15
tblVehicleEF	LDT2	0.99	0.18
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tblVehicleEF	LDT2	0.03	0.03

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tblVehicleEF	LDT2	4.50	5.26
tblVehicleEF	LDT2	0.18	0.20
tblVehicleEF	LDT2	0.38	0.46
tblVehicleEF	LDT2	0.51	0.62
tblVehicleEF	LDT2	0.04	0.01
tblVehicleEF	LDT2	3.0560e-003	0.02
tblVehicleEF	LDT2	4.3330e-003	0.01
tblVehicleEF	LDT2	0.02	0.01
tblVehicleEF	LDT2	2.0000e-003	8.0000e-003
tblVehicleEF	LDT2	2.7600e-003	0.02
tblVehicleEF	LDT2	3.9230e-003	0.01
tblVehicleEF	LDT2	0.32	0.36
tblVehicleEF	LDT2	0.32	0.29
tblVehicleEF	LDT2	0.20	0.19
tblVehicleEF	LDT2	0.13	0.13
tblVehicleEF	LDT2	0.93	0.17
tblVehicleEF	LDT2	0.39	0.44
tblVehicleEF	LDT2	5.2330e-003	4.9000e-003
tblVehicleEF	LDT2	1.0930e-003	1.0000e-003
tblVehicleEF	LDT2	0.32	0.36
tblVehicleEF	LDT2	0.32	0.29
tblVehicleEF	LDT2	0.20	0.19
tblVehicleEF	LDT2	0.16	0.16
tblVehicleEF	LDT2	0.93	0.17
tblVehicleEF	LDT2	0.41	0.47
tblVehicleEF	LDT2	0.03	0.03

tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	3.59	3.29
tblVehicleEF	LDT2	4.57	10.93
tblVehicleEF	LDT2	0.18	0.20
tblVehicleEF	LDT2	0.39	0.59
tblVehicleEF	LDT2	0.51	0.79
tblVehicleEF	LDT2	0.04	0.01
tblVehicleEF	LDT2	3.0560e-003	0.02
tblVehicleEF	LDT2	4.3330e-003	0.01
tblVehicleEF	LDT2	0.02	0.01
tblVehicleEF	LDT2	2.0000e-003	8.0000e-003
tblVehicleEF	LDT2	2.7600e-003	0.02
tblVehicleEF	LDT2	3.9230e-003	0.01
tblVehicleEF	LDT2	0.48	0.02
tblVehicleEF	LDT2	0.58	0.22
tblVehicleEF	LDT2	0.34	0.01
tblVehicleEF	LDT2	0.13	0.12
tblVehicleEF	LDT2	1.26	0.21
tblVehicleEF	LDT2	0.39	0.79
tblVehicleEF	LDT2	5.2120e-003	4.3000e-003
tblVehicleEF	LDT2	1.0940e-003	1.1000e-003
tblVehicleEF	LDT2	0.48	0.02
tblVehicleEF	LDT2	0.58	0.22
tblVehicleEF	LDT2	0.34	0.01
tblVehicleEF	LDT2	0.16	0.15
tblVehicleEF	LDT2	1.26	0.21
tblVehicleEF	LDT2	0.42	0.84
tblVehicleEF	LHD1	1.1760e-003	1.6000e-003

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tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	0.17	0.22
tblVehicleEF	LHD1	4.11	1.02
tblVehicleEF	LHD1	7.76	4.01
tblVehicleEF	LHD1	0.10	0.03
tblVehicleEF	LHD1	0.09	0.02
tblVehicleEF	LHD1	2.62	0.99
tblVehicleEF	LHD1	1.29	1.48
tblVehicleEF	LHD1	1.0240e-003	3.0000e-004
tblVehicleEF	LHD1	0.06	0.01
tblVehicleEF	LHD1	9.9260e-003	0.01
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	1.7330e-003	1.1000e-003
tblVehicleEF	LHD1	9.4200e-004	3.0000e-004
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	2.4820e-003	0.01
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	1.5880e-003	1.1000e-003
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tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	2.2100e-003	2.0000e-004
tblVehicleEF	LHD1	0.39	0.10
tblVehicleEF	LHD1	1.17	0.18
tblVehicleEF	LHD1	0.59	0.26
tblVehicleEF	LHD1	9.4000e-005	1.0000e-004
tblVehicleEF	LHD1	7.4900e-003	8.2000e-003

tblVehicleEF	LHD1	4.6400e-004	4.0000e-004
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tblVehicleEF	LHD1	1.1760e-003	1.6000e-003
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	0.17	0.22
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tblVehicleEF	LHD1	0.10	0.03
tblVehicleEF	LHD1	0.09	0.02
tblVehicleEF	LHD1	2.46	0.94
tblVehicleEF	LHD1	1.20	1.34
tblVehicleEF	LHD1	1.0240e-003	3.0000e-004
tblVehicleEF	LHD1	0.06	0.01
tblVehicleEF	LHD1	9.9260e-003	0.01
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	1.7330e-003	1.1000e-003
tblVehicleEF	LHD1	9.4200e-004	3.0000e-004
tblVehicleEF	LHD1	0.02	0.01
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tblVehicleEF	LHD1	1.5880e-003	1.1000e-003

tblVehicleEF	LHD1	0.01	1.9000e-003
tblVehicleEF	LHD1	0.15	0.02
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	3.6790e-003	5.0000e-004
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tblVehicleEF	LHD1	1.14	0.17
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tblVehicleEF	LHD1	4.1800e-004	4.0000e-004
tblVehicleEF	LHD1	0.01	1.9000e-003
tblVehicleEF	LHD1	0.15	0.02
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tblVehicleEF	LHD1	3.6790e-003	5.0000e-004
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tblVehicleEF	LHD1	1.1760e-003	1.6000e-003
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	0.17	0.22
tblVehicleEF	LHD1	4.22	1.02
tblVehicleEF	LHD1	5.09	4.88
tblVehicleEF	LHD1	0.10	0.03
tblVehicleEF	LHD1	0.09	0.02
tblVehicleEF	LHD1	2.51	1.02
tblVehicleEF	LHD1	1.20	1.55
tblVehicleEF	LHD1	1.0240e-003	3.0000e-004

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tblVehicleEF	LHD1	9.9260e-003	0.01
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	1.7330e-003	1.1000e-003
tblVehicleEF	LHD1	9.4200e-004	3.0000e-004
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	2.4820e-003	0.01
tblVehicleEF	LHD1	0.03	0.01
tblVehicleEF	LHD1	1.5880e-003	1.1000e-003
tblVehicleEF	LHD1	0.02	2.0000e-004
tblVehicleEF	LHD1	0.30	0.02
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	6.7900e-003	1.0000e-004
tblVehicleEF	LHD1	0.40	0.10
tblVehicleEF	LHD1	1.32	0.19
tblVehicleEF	LHD1	0.46	0.30
tblVehicleEF	LHD1	9.4000e-005	1.0000e-004
tblVehicleEF	LHD1	7.4930e-003	8.2000e-003
tblVehicleEF	LHD1	4.1800e-004	5.0000e-004
tblVehicleEF	LHD1	0.02	2.0000e-004
tblVehicleEF	LHD1	0.30	0.02
tblVehicleEF	LHD1	0.03	0.04
tblVehicleEF	LHD1	6.7900e-003	1.0000e-004
tblVehicleEF	LHD1	0.45	0.12
tblVehicleEF	LHD1	1.32	0.19
tblVehicleEF	LHD1	0.49	0.32
tblVehicleEF	LHD2	7.0600e-004	1.4000e-003
tblVehicleEF	LHD2	0.02	0.02

tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	0.11	0.19
tblVehicleEF	LHD2	1.86	2.77
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tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	0.16	0.05
tblVehicleEF	LHD2	3.25	2.02
tblVehicleEF	LHD2	0.45	1.44
tblVehicleEF	LHD2	1.7880e-003	7.0000e-004
tblVehicleEF	LHD2	0.08	0.01
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.04	0.02
tblVehicleEF	LHD2	5.5700e-004	1.5000e-003
tblVehicleEF	LHD2	1.6450e-003	7.0000e-004
tblVehicleEF	LHD2	0.03	0.01
tblVehicleEF	LHD2	2.8070e-003	0.01
tblVehicleEF	LHD2	0.04	0.02
tblVehicleEF	LHD2	4.9200e-004	1.5000e-003
tblVehicleEF	LHD2	1.5460e-003	1.9000e-003
tblVehicleEF	LHD2	0.04	0.05
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	7.5500e-004	4.0000e-004
tblVehicleEF	LHD2	0.24	0.30
tblVehicleEF	LHD2	0.25	0.63
tblVehicleEF	LHD2	0.20	0.50
tblVehicleEF	LHD2	1.0200e-004	1.0000e-004
tblVehicleEF	LHD2	5.9130e-003	7.3000e-003
tblVehicleEF	LHD2	1.7800e-004	4.0000e-004

tblVehicleEF	LHD2	1.5460e-003	1.9000e-003
tblVehicleEF	LHD2	0.04	0.05
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	7.5500e-004	4.0000e-004
tblVehicleEF	LHD2	0.27	0.33
tblVehicleEF	LHD2	0.25	0.63
tblVehicleEF	LHD2	0.21	0.53
tblVehicleEF	LHD2	7.0600e-004	1.4000e-003
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.11	0.19
tblVehicleEF	LHD2	1.88	2.87
tblVehicleEF	LHD2	1.63	4.09
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	0.16	0.05
tblVehicleEF	LHD2	3.09	1.91
tblVehicleEF	LHD2	0.42	1.30
tblVehicleEF	LHD2	1.7880e-003	7.0000e-004
tblVehicleEF	LHD2	0.08	0.01
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.04	0.02
tblVehicleEF	LHD2	5.5700e-004	1.5000e-003
tblVehicleEF	LHD2	1.6450e-003	7.0000e-004
tblVehicleEF	LHD2	0.03	0.01
tblVehicleEF	LHD2	2.8070e-003	0.01
tblVehicleEF	LHD2	0.04	0.02
tblVehicleEF	LHD2	4.9200e-004	1.5000e-003
tblVehicleEF	LHD2	3.2640e-003	6.1000e-003

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tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	1.2830e-003	1.2000e-003
tblVehicleEF	LHD2	0.24	0.31
tblVehicleEF	LHD2	0.24	0.62
tblVehicleEF	LHD2	0.15	0.33
tblVehicleEF	LHD2	1.0200e-004	1.0000e-004
tblVehicleEF	LHD2	5.9130e-003	7.3000e-003
tblVehicleEF	LHD2	1.6200e-004	4.0000e-004
tblVehicleEF	LHD2	3.2640e-003	6.1000e-003
tblVehicleEF	LHD2	0.05	0.07
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	1.2830e-003	1.2000e-003
tblVehicleEF	LHD2	0.27	0.35
tblVehicleEF	LHD2	0.24	0.62
tblVehicleEF	LHD2	0.16	0.36
tblVehicleEF	LHD2	7.0600e-004	1.4000e-003
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	0.01	0.03
tblVehicleEF	LHD2	0.11	0.19
tblVehicleEF	LHD2	1.88	2.72
tblVehicleEF	LHD2	1.63	9.57
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	0.16	0.05
tblVehicleEF	LHD2	3.15	2.08
tblVehicleEF	LHD2	0.42	1.51
tblVehicleEF	LHD2	1.7880e-003	7.0000e-004
tblVehicleEF	LHD2	0.08	0.01

tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.04	0.02
tblVehicleEF	LHD2	5.5700e-004	1.5000e-003
tblVehicleEF	LHD2	1.6450e-003	7.0000e-004
tblVehicleEF	LHD2	0.03	0.01
tblVehicleEF	LHD2	2.8070e-003	0.01
tblVehicleEF	LHD2	0.04	0.02
tblVehicleEF	LHD2	4.9200e-004	1.5000e-003
tblVehicleEF	LHD2	5.1450e-003	4.0000e-004
tblVehicleEF	LHD2	0.09	0.06
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	2.4490e-003	1.0000e-004
tblVehicleEF	LHD2	0.24	0.29
tblVehicleEF	LHD2	0.28	0.68
tblVehicleEF	LHD2	0.15	0.58
tblVehicleEF	LHD2	1.0200e-004	1.0000e-004
tblVehicleEF	LHD2	5.9130e-003	7.3000e-003
tblVehicleEF	LHD2	1.6200e-004	5.0000e-004
tblVehicleEF	LHD2	5.1450e-003	4.0000e-004
tblVehicleEF	LHD2	0.09	0.06
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	2.4490e-003	1.0000e-004
tblVehicleEF	LHD2	0.27	0.33
tblVehicleEF	LHD2	0.28	0.68
tblVehicleEF	LHD2	0.16	0.62
tblVehicleEF	MCY	0.00	0.22
tblVehicleEF	MCY	0.00	0.16
tblVehicleEF	MCY	32.11	32.39

tblVehicleEF	MCY	10.95	12.41
tblVehicleEF	MCY	7.3920e-003	0.01
tblVehicleEF	MCY	1.31	1.37
tblVehicleEF	MCY	0.32	0.32
tblVehicleEF	MCY	0.04	6.3000e-003
tblVehicleEF	MCY	8.0000e-003	4.0000e-003
tblVehicleEF	MCY	8.0500e-004	0.02
tblVehicleEF	MCY	2.3350e-003	0.01
tblVehicleEF	MCY	0.02	6.3000e-003
tblVehicleEF	MCY	2.0000e-003	4.0000e-003
tblVehicleEF	MCY	6.4500e-004	0.02
tblVehicleEF	MCY	1.8350e-003	0.01
tblVehicleEF	MCY	1.12	0.64
tblVehicleEF	MCY	0.57	0.28
tblVehicleEF	MCY	0.72	0.23
tblVehicleEF	MCY	3.00	3.04
tblVehicleEF	MCY	1.99	0.34
tblVehicleEF	MCY	2.40	2.62
tblVehicleEF	MCY	2.1750e-003	2.1000e-003
tblVehicleEF	MCY	7.0800e-004	7.0000e-004
tblVehicleEF	MCY	1.12	0.64
tblVehicleEF	MCY	0.57	0.28
tblVehicleEF	MCY	0.72	0.23
tblVehicleEF	MCY	3.27	3.31
tblVehicleEF	MCY	1.99	0.34
tblVehicleEF	MCY	2.58	2.82
tblVehicleEF	MCY	0.00	0.21
tblVehicleEF	MCY	0.00	0.11

tblVehicleEF	MCY	29.81	29.27
tblVehicleEF	MCY	8.78	8.78
tblVehicleEF	MCY	7.3920e-003	0.01
tblVehicleEF	MCY	1.12	1.15
tblVehicleEF	MCY	0.29	0.28
tblVehicleEF	MCY	0.04	6.3000e-003
tblVehicleEF	MCY	8.0000e-003	4.0000e-003
tblVehicleEF	MCY	8.0500e-004	0.02
tblVehicleEF	MCY	2.3350e-003	0.01
tblVehicleEF	MCY	0.02	6.3000e-003
tblVehicleEF	MCY	2.0000e-003	4.0000e-003
tblVehicleEF	MCY	6.4500e-004	0.02
tblVehicleEF	MCY	1.8350e-003	0.01
tblVehicleEF	MCY	2.49	2.47
tblVehicleEF	MCY	0.75	0.51
tblVehicleEF	MCY	1.40	1.21
tblVehicleEF	MCY	2.83	2.81
tblVehicleEF	MCY	1.87	0.33
tblVehicleEF	MCY	1.87	1.83
tblVehicleEF	MCY	2.1340e-003	2.1000e-003
tblVehicleEF	MCY	6.5700e-004	6.0000e-004
tblVehicleEF	MCY	2.49	2.47
tblVehicleEF	MCY	0.75	0.51
tblVehicleEF	MCY	1.40	1.21
tblVehicleEF	MCY	3.09	3.07
tblVehicleEF	MCY	1.87	0.33
tblVehicleEF	MCY	2.01	1.97
tblVehicleEF	MCY	0.00	0.23

tblVehicleEF	MCY	0.00	0.19
tblVehicleEF	MCY	30.06	35.29
tblVehicleEF	MCY	8.82	14.27
tblVehicleEF	MCY	7.3920e-003	0.01
tblVehicleEF	MCY	1.17	1.48
tblVehicleEF	MCY	0.29	0.35
tblVehicleEF	MCY	0.04	6.3000e-003
tblVehicleEF	MCY	8.0000e-003	4.0000e-003
tblVehicleEF	MCY	8.0500e-004	0.02
tblVehicleEF	MCY	2.3350e-003	0.01
tblVehicleEF	MCY	0.02	6.3000e-003
tblVehicleEF	MCY	2.0000e-003	4.0000e-003
tblVehicleEF	MCY	6.4500e-004	0.02
tblVehicleEF	MCY	1.8350e-003	0.01
tblVehicleEF	MCY	4.38	0.05
tblVehicleEF	MCY	1.78	0.28
tblVehicleEF	MCY	2.91	0.02
tblVehicleEF	MCY	2.84	3.19
tblVehicleEF	MCY	2.45	0.40
tblVehicleEF	MCY	1.88	3.04
tblVehicleEF	MCY	2.1380e-003	2.2000e-003
tblVehicleEF	MCY	6.5800e-004	7.0000e-004
tblVehicleEF	MCY	4.38	0.05
tblVehicleEF	MCY	1.78	0.28
tblVehicleEF	MCY	2.91	0.02
tblVehicleEF	MCY	3.10	3.47
tblVehicleEF	MCY	2.45	0.40
tblVehicleEF	MCY	2.02	3.26

tblVehicleEF	MDV	0.04	0.03
tblVehicleEF	MDV	0.05	0.04
tblVehicleEF	MDV	4.37	3.65
tblVehicleEF	MDV	10.31	10.27
tblVehicleEF	MDV	0.15	0.08
tblVehicleEF	MDV	0.77	0.65
tblVehicleEF	MDV	0.97	0.93
tblVehicleEF	MDV	0.04	0.01
tblVehicleEF	MDV	3.4880e-003	0.02
tblVehicleEF	MDV	5.1450e-003	0.01
tblVehicleEF	MDV	0.02	0.01
tblVehicleEF	MDV	2.0000e-003	8.0000e-003
tblVehicleEF	MDV	3.1920e-003	0.02
tblVehicleEF	MDV	4.7220e-003	0.01
tblVehicleEF	MDV	0.18	0.09
tblVehicleEF	MDV	0.35	0.21
tblVehicleEF	MDV	0.13	0.05
tblVehicleEF	MDV	0.18	0.14
tblVehicleEF	MDV	1.34	0.18
tblVehicleEF	MDV	0.91	0.85
tblVehicleEF	MDV	6.1930e-003	5.9000e-003
tblVehicleEF	MDV	1.4490e-003	1.4000e-003
tblVehicleEF	MDV	0.18	0.09
tblVehicleEF	MDV	0.35	0.21
tblVehicleEF	MDV	0.13	0.05
tblVehicleEF	MDV	0.23	0.18
tblVehicleEF	MDV	1.34	0.18
tblVehicleEF	MDV	0.97	0.91

tblVehicleEF	MDV	0.04	0.04
tblVehicleEF	MDV	0.05	0.03
tblVehicleEF	MDV	4.78	4.15
tblVehicleEF	MDV	6.91	6.04
tblVehicleEF	MDV	0.15	0.08
tblVehicleEF	MDV	0.66	0.56
tblVehicleEF	MDV	0.85	0.79
tblVehicleEF	MDV	0.04	0.01
tblVehicleEF	MDV	3.4880e-003	0.02
tblVehicleEF	MDV	5.1450e-003	0.01
tblVehicleEF	MDV	0.02	0.01
tblVehicleEF	MDV	2.0000e-003	8.0000e-003
tblVehicleEF	MDV	3.1920e-003	0.02
tblVehicleEF	MDV	4.7220e-003	0.01
tblVehicleEF	MDV	0.38	0.32
tblVehicleEF	MDV	0.41	0.27
tblVehicleEF	MDV	0.24	0.18
tblVehicleEF	MDV	0.19	0.15
tblVehicleEF	MDV	1.25	0.17
tblVehicleEF	MDV	0.67	0.56
tblVehicleEF	MDV	6.6080e-003	6.7000e-003
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tblVehicleEF	MDV	0.38	0.32
tblVehicleEF	MDV	0.41	0.27
tblVehicleEF	MDV	0.24	0.18
tblVehicleEF	MDV	0.24	0.19
tblVehicleEF	MDV	1.25	0.17
tblVehicleEF	MDV	0.72	0.60

tblVehicleEF	MDV	0.04	0.03
tblVehicleEF	MDV	0.05	0.05
tblVehicleEF	MDV	4.77	3.69
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tblVehicleEF	MDV	0.15	0.08
tblVehicleEF	MDV	0.69	0.72
tblVehicleEF	MDV	0.86	1.01
tblVehicleEF	MDV	0.04	0.01
tblVehicleEF	MDV	3.4880e-003	0.02
tblVehicleEF	MDV	5.1450e-003	0.01
tblVehicleEF	MDV	0.02	0.01
tblVehicleEF	MDV	2.0000e-003	8.0000e-003
tblVehicleEF	MDV	3.1920e-003	0.02
tblVehicleEF	MDV	4.7220e-003	0.01
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tblVehicleEF	MDV	0.72	0.21
tblVehicleEF	MDV	0.38	0.01
tblVehicleEF	MDV	0.19	0.14
tblVehicleEF	MDV	1.71	0.21
tblVehicleEF	MDV	0.68	0.99
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tblVehicleEF	MDV	1.3900e-003	1.4000e-003
tblVehicleEF	MDV	0.55	0.01
tblVehicleEF	MDV	0.72	0.21
tblVehicleEF	MDV	0.38	0.01
tblVehicleEF	MDV	0.24	0.18
tblVehicleEF	MDV	1.71	0.21
tblVehicleEF	MDV	0.72	1.06

tblVehicleEF	MH	0.00	0.07
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tblVehicleEF	MH	17.22	29.19
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tblVehicleEF	MH	2.27	3.29
tblVehicleEF	MH	1.39	1.85
tblVehicleEF	MH	0.05	0.01
tblVehicleEF	MH	8.4670e-003	0.01
tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.5670e-003	1.2000e-003
tblVehicleEF	MH	0.02	0.01
tblVehicleEF	MH	2.1170e-003	0.01
tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.2270e-003	1.2000e-003
tblVehicleEF	MH	2.05	1.94
tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.69	0.46
tblVehicleEF	MH	0.35	0.61
tblVehicleEF	MH	3.06	0.04
tblVehicleEF	MH	1.06	1.73
tblVehicleEF	MH	7.5500e-003	7.8000e-003
tblVehicleEF	MH	6.5500e-004	8.0000e-004
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tblVehicleEF	MH	0.13	0.13
tblVehicleEF	MH	0.69	0.46
tblVehicleEF	MH	0.40	0.69
tblVehicleEF	MH	3.06	0.04

tblVehicleEF	MH	1.14	1.85
tblVehicleEF	MH	0.00	0.07
tblVehicleEF	MH	0.00	0.06
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tblVehicleEF	MH	10.76	14.48
tblVehicleEF	MH	6.0920e-003	6.5370e-003
tblVehicleEF	MH	2.04	2.92
tblVehicleEF	MH	1.30	1.68
tblVehicleEF	MH	0.05	0.01
tblVehicleEF	MH	8.4670e-003	0.01
tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.5670e-003	1.2000e-003
tblVehicleEF	MH	0.02	0.01
tblVehicleEF	MH	2.1170e-003	0.01
tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.2270e-003	1.2000e-003
tblVehicleEF	MH	4.33	6.30
tblVehicleEF	MH	0.15	0.18
tblVehicleEF	MH	1.00	1.39
tblVehicleEF	MH	0.35	0.63
tblVehicleEF	MH	2.99	0.04
tblVehicleEF	MH	0.75	1.01
tblVehicleEF	MH	7.5520e-003	7.8000e-003
tblVehicleEF	MH	5.4300e-004	6.0000e-004
tblVehicleEF	MH	4.33	6.30
tblVehicleEF	MH	0.15	0.18
tblVehicleEF	MH	1.00	1.39
tblVehicleEF	MH	0.40	0.72

tblVehicleEF	MH	2.99	0.04
tblVehicleEF	MH	0.80	1.08
tblVehicleEF	MH	0.00	0.07
tblVehicleEF	MH	0.00	0.12
tblVehicleEF	MH	9.92	15.79
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tblVehicleEF	MH	6.0920e-003	6.5370e-003
tblVehicleEF	MH	2.10	3.49
tblVehicleEF	MH	1.30	1.95
tblVehicleEF	MH	0.05	0.01
tblVehicleEF	MH	8.4670e-003	0.01
tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.5670e-003	1.2000e-003
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tblVehicleEF	MH	2.1170e-003	0.01
tblVehicleEF	MH	0.03	0.02
tblVehicleEF	MH	2.2270e-003	1.2000e-003
tblVehicleEF	MH	6.84	0.35
tblVehicleEF	MH	0.29	0.15
tblVehicleEF	MH	2.17	0.16
tblVehicleEF	MH	0.35	0.60
tblVehicleEF	MH	3.30	0.04
tblVehicleEF	MH	0.75	2.07
tblVehicleEF	MH	7.5530e-003	7.8000e-003
tblVehicleEF	MH	5.4300e-004	1.0000e-003
tblVehicleEF	MH	6.84	0.35
tblVehicleEF	MH	0.29	0.15
tblVehicleEF	MH	2.17	0.16

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tblVehicleEF	MHD	0.01	0.01
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tblVehicleEF	MHD	2.7180e-003	0.01
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tblVehicleEF	MHD	5.7810e-003	1.0000e-004
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tblVehicleEF	MHD	1.4330e-003	5.0000e-004
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tblVehicleEF	MHD	4.2500e-003	4.0000e-004
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tblVehicleEF	MHD	1.91	0.78
tblVehicleEF	MHD	0.06	2.4000e-003
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tblVehicleEF	MHD	0.01	0.01
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tblVehicleEF	MHD	7.3470e-003	1.3000e-003
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tblVehicleEF	MHD	1.62	0.43
tblVehicleEF	MHD	2.34	0.93
tblVehicleEF	MHD	6.1240e-003	1.0000e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	1.2700e-003	4.0000e-004
tblVehicleEF	MHD	0.02	5.3000e-003
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tblVehicleEF	MHD	7.3470e-003	1.3000e-003
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tblVehicleEF	MHD	1.62	0.43
tblVehicleEF	MHD	2.52	1.00
tblVehicleEF	MHD	0.01	1.1000e-003
tblVehicleEF	MHD	9.5610e-003	0.01
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tblVehicleEF	MHD	2.93	3.72
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tblVehicleEF	MHD	0.02	0.02

tblVehicleEF	MHD	6.73	0.16
tblVehicleEF	MHD	4.25	4.01
tblVehicleEF	MHD	1.91	0.91
tblVehicleEF	MHD	0.09	2.4000e-003
tblVehicleEF	MHD	0.10	0.01
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	0.12	0.14
tblVehicleEF	MHD	9.7780e-003	1.7000e-003
tblVehicleEF	MHD	0.08	2.4000e-003
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	2.7180e-003	0.01
tblVehicleEF	MHD	0.11	0.14
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tblVehicleEF	MHD	0.32	0.02
tblVehicleEF	MHD	0.02	1.0000e-004
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tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	1.2710e-003	6.0000e-004
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tblVehicleEF	MHD	0.87	0.05
tblVehicleEF	MHD	0.36	0.02
tblVehicleEF	MHD	0.02	1.0000e-004
tblVehicleEF	MHD	0.36	0.26

tblVehicleEF	MHD	1.87	0.45
tblVehicleEF	MHD	2.52	1.92
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tblVehicleEF	OBUS	2.9480e-003	0.02
tblVehicleEF	OBUS	0.00	0.05
tblVehicleEF	OBUS	2.24	0.18
tblVehicleEF	OBUS	2.13	3.58
tblVehicleEF	OBUS	14.81	15.02
tblVehicleEF	OBUS	3.9530e-003	1.7350e-003
tblVehicleEF	OBUS	6.46	0.12
tblVehicleEF	OBUS	4.62	3.64
tblVehicleEF	OBUS	1.77	1.81
tblVehicleEF	OBUS	0.02	1.3000e-003
tblVehicleEF	OBUS	0.09	0.01
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	0.06	0.11
tblVehicleEF	OBUS	2.3860e-003	2.3000e-003
tblVehicleEF	OBUS	0.02	1.3000e-003
tblVehicleEF	OBUS	0.04	0.01
tblVehicleEF	OBUS	2.5450e-003	0.01
tblVehicleEF	OBUS	0.05	0.11
tblVehicleEF	OBUS	1.8930e-003	2.3000e-003
tblVehicleEF	OBUS	1.4710e-003	6.0000e-004
tblVehicleEF	OBUS	0.04	0.02
tblVehicleEF	OBUS	0.40	0.03
tblVehicleEF	OBUS	5.9200e-004	2.0000e-004
tblVehicleEF	OBUS	0.21	0.23
tblVehicleEF	OBUS	0.46	0.23

tblVehicleEF	OBUS	1.18	0.97
tblVehicleEF	OBUS	5.6380e-003	1.0000e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	6.9500e-004	5.0000e-004
tblVehicleEF	OBUS	1.4710e-003	6.0000e-004
tblVehicleEF	OBUS	0.04	0.02
tblVehicleEF	OBUS	0.45	0.03
tblVehicleEF	OBUS	5.9200e-004	2.0000e-004
tblVehicleEF	OBUS	0.25	0.26
tblVehicleEF	OBUS	0.46	0.23
tblVehicleEF	OBUS	1.27	1.03
tblVehicleEF	OBUS	0.02	1.3000e-003
tblVehicleEF	OBUS	2.9480e-003	0.02
tblVehicleEF	OBUS	0.00	0.04
tblVehicleEF	OBUS	1.63	0.18
tblVehicleEF	OBUS	2.12	3.66
tblVehicleEF	OBUS	10.93	9.17
tblVehicleEF	OBUS	3.9530e-003	1.7350e-003
tblVehicleEF	OBUS	6.67	0.12
tblVehicleEF	OBUS	4.37	3.40
tblVehicleEF	OBUS	1.65	1.64
tblVehicleEF	OBUS	0.02	1.3000e-003
tblVehicleEF	OBUS	0.09	0.01
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	0.06	0.11
tblVehicleEF	OBUS	2.3860e-003	2.3000e-003
tblVehicleEF	OBUS	0.02	1.3000e-003
tblVehicleEF	OBUS	0.04	0.01

tblVehicleEF	OBUS	2.5450e-003	0.01
tblVehicleEF	OBUS	0.05	0.11
tblVehicleEF	OBUS	1.8930e-003	2.3000e-003
tblVehicleEF	OBUS	3.1470e-003	2.0000e-003
tblVehicleEF	OBUS	0.05	0.02
tblVehicleEF	OBUS	0.37	0.03
tblVehicleEF	OBUS	8.9000e-004	6.0000e-004
tblVehicleEF	OBUS	0.21	0.23
tblVehicleEF	OBUS	0.45	0.22
tblVehicleEF	OBUS	0.91	0.69
tblVehicleEF	OBUS	5.9730e-003	1.0000e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	6.2600e-004	4.0000e-004
tblVehicleEF	OBUS	3.1470e-003	2.0000e-003
tblVehicleEF	OBUS	0.05	0.02
tblVehicleEF	OBUS	0.43	0.03
tblVehicleEF	OBUS	8.9000e-004	6.0000e-004
tblVehicleEF	OBUS	0.25	0.27
tblVehicleEF	OBUS	0.45	0.22
tblVehicleEF	OBUS	0.98	0.74
tblVehicleEF	OBUS	0.02	1.3000e-003
tblVehicleEF	OBUS	2.9480e-003	0.02
tblVehicleEF	OBUS	0.00	0.06
tblVehicleEF	OBUS	3.09	0.18
tblVehicleEF	OBUS	2.13	3.56
tblVehicleEF	OBUS	10.94	17.94
tblVehicleEF	OBUS	3.9530e-003	1.7350e-003
tblVehicleEF	OBUS	6.17	0.12

tblVehicleEF	OBUS	4.46	3.77
tblVehicleEF	OBUS	1.65	1.90
tblVehicleEF	OBUS	0.03	1.3000e-003
tblVehicleEF	OBUS	0.09	0.01
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	0.06	0.11
tblVehicleEF	OBUS	2.3860e-003	2.3000e-003
tblVehicleEF	OBUS	0.02	1.3000e-003
tblVehicleEF	OBUS	0.04	0.01
tblVehicleEF	OBUS	2.5450e-003	0.01
tblVehicleEF	OBUS	0.05	0.11
tblVehicleEF	OBUS	1.8930e-003	2.3000e-003
tblVehicleEF	OBUS	4.7640e-003	2.0000e-004
tblVehicleEF	OBUS	0.09	0.02
tblVehicleEF	OBUS	0.43	0.03
tblVehicleEF	OBUS	1.9520e-003	1.0000e-004
tblVehicleEF	OBUS	0.21	0.22
tblVehicleEF	OBUS	0.51	0.24
tblVehicleEF	OBUS	0.92	1.11
tblVehicleEF	OBUS	5.1760e-003	1.0000e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	6.2600e-004	5.0000e-004
tblVehicleEF	OBUS	4.7640e-003	2.0000e-004
tblVehicleEF	OBUS	0.09	0.02
tblVehicleEF	OBUS	0.49	0.03
tblVehicleEF	OBUS	1.9520e-003	1.0000e-004
tblVehicleEF	OBUS	0.25	0.26
tblVehicleEF	OBUS	0.51	0.24

tblVehicleEF	OBUS	0.98	1.19
tblVehicleEF	SBUS	5.4240e-003	0.04
tblVehicleEF	SBUS	7.1220e-003	0.04
tblVehicleEF	SBUS	0.00	0.05
tblVehicleEF	SBUS	1.05	6.93
tblVehicleEF	SBUS	11.09	8.37
tblVehicleEF	SBUS	59.28	13.08
tblVehicleEF	SBUS	1.6690e-003	2.2260e-003
tblVehicleEF	SBUS	8.14	7.87
tblVehicleEF	SBUS	8.51	7.78
tblVehicleEF	SBUS	3.94	0.88
tblVehicleEF	SBUS	0.03	0.11
tblVehicleEF	SBUS	0.53	0.01
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.08	0.31
tblVehicleEF	SBUS	0.01	1.8000e-003
tblVehicleEF	SBUS	0.03	0.11
tblVehicleEF	SBUS	0.23	0.01
tblVehicleEF	SBUS	2.7010e-003	0.01
tblVehicleEF	SBUS	0.08	0.31
tblVehicleEF	SBUS	9.4640e-003	1.8000e-003
tblVehicleEF	SBUS	0.07	8.7000e-003
tblVehicleEF	SBUS	0.46	0.07
tblVehicleEF	SBUS	0.12	1.05
tblVehicleEF	SBUS	0.02	2.2000e-003
tblVehicleEF	SBUS	0.79	0.64
tblVehicleEF	SBUS	3.57	0.08
tblVehicleEF	SBUS	4.55	0.97

tblVehicleEF	SBUS	5.6380e-003	5.5000e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	2.4760e-003	5.0000e-004
tblVehicleEF	SBUS	0.07	8.7000e-003
tblVehicleEF	SBUS	0.46	0.07
tblVehicleEF	SBUS	0.13	1.13
tblVehicleEF	SBUS	0.02	2.2000e-003
tblVehicleEF	SBUS	0.87	0.71
tblVehicleEF	SBUS	3.57	0.08
tblVehicleEF	SBUS	4.88	1.04
tblVehicleEF	SBUS	5.1110e-003	0.04
tblVehicleEF	SBUS	7.1220e-003	0.04
tblVehicleEF	SBUS	0.00	0.04
tblVehicleEF	SBUS	0.77	6.93
tblVehicleEF	SBUS	10.69	8.19
tblVehicleEF	SBUS	45.07	9.02
tblVehicleEF	SBUS	1.6690e-003	2.2260e-003
tblVehicleEF	SBUS	8.40	7.87
tblVehicleEF	SBUS	7.99	7.40
tblVehicleEF	SBUS	3.59	0.78
tblVehicleEF	SBUS	0.02	0.11
tblVehicleEF	SBUS	0.53	0.01
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.08	0.31
tblVehicleEF	SBUS	0.01	1.8000e-003
tblVehicleEF	SBUS	0.02	0.11
tblVehicleEF	SBUS	0.23	0.01
tblVehicleEF	SBUS	2.7010e-003	0.01

tblVehicleEF	SBUS	0.08	0.31
tblVehicleEF	SBUS	9.4640e-003	1.8000e-003
tblVehicleEF	SBUS	0.14	0.02
tblVehicleEF	SBUS	0.51	0.09
tblVehicleEF	SBUS	0.11	1.05
tblVehicleEF	SBUS	0.04	6.8000e-003
tblVehicleEF	SBUS	0.78	0.64
tblVehicleEF	SBUS	3.14	0.07
tblVehicleEF	SBUS	3.59	0.73
tblVehicleEF	SBUS	5.9730e-003	5.5000e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	2.2230e-003	4.0000e-004
tblVehicleEF	SBUS	0.14	0.02
tblVehicleEF	SBUS	0.51	0.09
tblVehicleEF	SBUS	0.13	1.13
tblVehicleEF	SBUS	0.04	6.8000e-003
tblVehicleEF	SBUS	0.86	0.71
tblVehicleEF	SBUS	3.14	0.07
tblVehicleEF	SBUS	3.85	0.78
tblVehicleEF	SBUS	5.8550e-003	0.04
tblVehicleEF	SBUS	7.1220e-003	0.04
tblVehicleEF	SBUS	0.00	0.06
tblVehicleEF	SBUS	1.45	6.93
tblVehicleEF	SBUS	10.75	8.60
tblVehicleEF	SBUS	45.53	15.34
tblVehicleEF	SBUS	1.6690e-003	2.2260e-003
tblVehicleEF	SBUS	7.78	7.87
tblVehicleEF	SBUS	8.18	8.01

tblVehicleEF	SBUS	3.62	0.94
tblVehicleEF	SBUS	0.03	0.11
tblVehicleEF	SBUS	0.53	0.01
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.08	0.31
tblVehicleEF	SBUS	0.01	1.8000e-003
tblVehicleEF	SBUS	0.03	0.11
tblVehicleEF	SBUS	0.23	0.01
tblVehicleEF	SBUS	2.7010e-003	0.01
tblVehicleEF	SBUS	0.08	0.31
tblVehicleEF	SBUS	9.4640e-003	1.8000e-003
tblVehicleEF	SBUS	0.23	1.6000e-003
tblVehicleEF	SBUS	0.88	0.08
tblVehicleEF	SBUS	0.13	1.05
tblVehicleEF	SBUS	0.08	8.0000e-004
tblVehicleEF	SBUS	0.78	0.64
tblVehicleEF	SBUS	4.31	0.09
tblVehicleEF	SBUS	3.64	1.11
tblVehicleEF	SBUS	5.1750e-003	5.5000e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	2.2310e-003	5.0000e-004
tblVehicleEF	SBUS	0.23	1.6000e-003
tblVehicleEF	SBUS	0.88	0.08
tblVehicleEF	SBUS	0.14	1.13
tblVehicleEF	SBUS	0.08	8.0000e-004
tblVehicleEF	SBUS	0.86	0.71
tblVehicleEF	SBUS	4.31	0.09
tblVehicleEF	SBUS	3.90	1.19

tblVehicleEF	UBUS	0.00	0.03
tblVehicleEF	UBUS	0.00	0.14
tblVehicleEF	UBUS	6.02	6.17
tblVehicleEF	UBUS	27.32	35.83
tblVehicleEF	UBUS	1.1840e-003	1.5730e-003
tblVehicleEF	UBUS	4.05	4.29
tblVehicleEF	UBUS	3.82	4.52
tblVehicleEF	UBUS	0.54	0.01
tblVehicleEF	UBUS	8.0000e-003	0.01
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	9.5100e-004	7.1000e-003
tblVehicleEF	UBUS	0.23	0.01
tblVehicleEF	UBUS	2.0000e-003	0.01
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	8.8200e-004	7.1000e-003
tblVehicleEF	UBUS	0.01	7.4000e-003
tblVehicleEF	UBUS	0.19	0.14
tblVehicleEF	UBUS	6.4420e-003	3.0000e-003
tblVehicleEF	UBUS	0.45	0.48
tblVehicleEF	UBUS	0.92	0.03
tblVehicleEF	UBUS	2.02	2.54
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	1.0500e-003	1.4000e-003
tblVehicleEF	UBUS	0.01	7.4000e-003
tblVehicleEF	UBUS	0.19	0.14
tblVehicleEF	UBUS	6.4420e-003	3.0000e-003
tblVehicleEF	UBUS	0.51	0.54
tblVehicleEF	UBUS	0.92	0.03

tblVehicleEF	UBUS	2.16	2.71
tblVehicleEF	UBUS	0.00	0.04
tblVehicleEF	UBUS	0.00	0.11
tblVehicleEF	UBUS	6.20	6.45
tblVehicleEF	UBUS	20.27	23.17
tblVehicleEF	UBUS	1.1840e-003	1.5730e-003
tblVehicleEF	UBUS	3.70	3.91
tblVehicleEF	UBUS	3.54	4.04
tblVehicleEF	UBUS	0.54	0.01
tblVehicleEF	UBUS	8.0000e-003	0.01
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	9.5100e-004	7.1000e-003
tblVehicleEF	UBUS	0.23	0.01
tblVehicleEF	UBUS	2.0000e-003	0.01
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	8.8200e-004	7.1000e-003
tblVehicleEF	UBUS	0.03	0.02
tblVehicleEF	UBUS	0.22	0.19
tblVehicleEF	UBUS	0.01	9.5000e-003
tblVehicleEF	UBUS	0.47	0.50
tblVehicleEF	UBUS	0.84	0.02
tblVehicleEF	UBUS	1.71	2.00
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	9.3000e-004	1.2000e-003
tblVehicleEF	UBUS	0.03	0.02
tblVehicleEF	UBUS	0.22	0.19
tblVehicleEF	UBUS	0.01	9.5000e-003
tblVehicleEF	UBUS	0.52	0.56

tblVehicleEF	UBUS	0.84	0.02
tblVehicleEF	UBUS	1.83	2.13
tblVehicleEF	UBUS	0.00	0.03
tblVehicleEF	UBUS	0.00	0.15
tblVehicleEF	UBUS	6.20	6.03
tblVehicleEF	UBUS	20.35	42.00
tblVehicleEF	UBUS	1.1840e-003	1.5730e-003
tblVehicleEF	UBUS	3.80	4.49
tblVehicleEF	UBUS	3.54	4.77
tblVehicleEF	UBUS	0.54	0.01
tblVehicleEF	UBUS	8.0000e-003	0.01
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	9.5100e-004	7.1000e-003
tblVehicleEF	UBUS	0.23	0.01
tblVehicleEF	UBUS	2.0000e-003	0.01
tblVehicleEF	UBUS	0.02	0.05
tblVehicleEF	UBUS	8.8200e-004	7.1000e-003
tblVehicleEF	UBUS	0.04	1.8000e-003
tblVehicleEF	UBUS	0.42	0.14
tblVehicleEF	UBUS	0.02	1.2000e-003
tblVehicleEF	UBUS	0.47	0.47
tblVehicleEF	UBUS	1.22	0.03
tblVehicleEF	UBUS	1.72	2.81
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	9.3200e-004	1.5000e-003
tblVehicleEF	UBUS	0.04	1.8000e-003
tblVehicleEF	UBUS	0.42	0.14
tblVehicleEF	UBUS	0.02	1.2000e-003

tblVehicleEF	UBUS	0.52	0.53
tblVehicleEF	UBUS	1.22	0.03
tblVehicleEF	UBUS	1.83	3.00
tblWater	AerobicPercent	87.46	84.69
tblWater	AnaDigestCombDigestGasPercent	100.00	3.17
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	2.14
tblWater	SepticTankPercent	10.33	10.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2014	57.8927	662.1220	346.4363	0.6622	2,369.834 6	27.4666	2,397.301 1	244.6685	25.2689	269.9373			69,934.45 43	20.3628	0.0000	70,362.07 26
2015	20.5583	236.8487	135.2489	0.2158	54.4234	9.8013	64.2246	13.5637	9.0172	22.5809			22,648.76 78	6.7509	0.0000	22,790.53 69
2016	19.2501	218.0086	127.1749	0.2156	54.4234	8.9819	63.4053	13.5637	8.2634	21.8271			22,386.90 09	6.7418	0.0000	22,528.47 92
2017	18.0903	201.4328	119.2348	0.2155	54.4234	8.2413	62.6646	13.5637	7.5820	21.1457			22,027.26 13	6.7381	0.0000	22,168.76 15
Total	**115.7914**	**1,318.412 2**	**728.0949**	**1.3091**	**2,533.104 6**	**54.4910**	**2,587.595 6**	**285.3596**	**50.1313**	**335.4909**			**136,997.3 843**	**40.5936**	**0.0000**	**137,849.8 502**

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2014	57.8927	662.1220	346.4363	0.6622	1,439.8398	27.4666	1,467.3063	144.0742	25.2689	169.3430			69,934.4543	20.3628	0.0000	70,362.0725
2015	20.5583	236.8487	135.2489	0.2158	36.4724	9.8013	46.2737	4.1871	9.0172	13.2042			22,648.7677	6.7509	0.0000	22,790.5369
2016	19.2501	218.0086	127.1749	0.2156	36.4724	8.9819	45.4543	4.1871	8.2634	12.4504			22,386.9009	6.7418	0.0000	22,528.4792
2017	18.0903	201.4328	119.2348	0.2155	36.4724	8.2413	44.7136	4.1871	7.5820	11.7690			22,027.2613	6.7381	0.0000	22,168.7615
Total	**115.7914**	**1,318.4122**	**728.0949**	**1.3091**	**1,549.2569**	**54.4910**	**1,603.7479**	**156.6354**	**50.1313**	**206.7667**			**136,997.3842**	**40.5936**	**0.0000**	**137,849.8501**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**38.84**	**0.00**	**38.02**	**45.11**	**0.00**	**38.37**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000			2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Total	**1.0000e-005**	**0.0000**	**1.1000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**			**2.2000e-004**	**0.0000**	**0.0000**	**2.3000e-004**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000			2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Total	**1.0000e-005**	**0.0000**	**1.1000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**			**2.2000e-004**	**0.0000**	**0.0000**	**2.3000e-004**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site preparation	Site Preparation	2/1/2014	2/7/2014	5	5	
2	Distribute straw bales on sand dunes	Site Preparation	2/8/2014	8/8/2014	5	130	
3	Planting and watering	Site Preparation	8/9/2014	11/28/2014	5	80	
4	Clean up and restoration	Site Preparation	11/29/2014	12/12/2014	5	10	
5	Operation and maintenance	Site Preparation	1/1/2015	12/31/2017	5	782	
6	ATVs	Site Preparation	1/1/2015	12/31/2017	5	782	
7	Water Trucks	Site Preparation	1/1/2015	12/31/2017	5	782	

Acres of Grading (Site Preparation Phase): 5.6

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site preparation	Graders	2	8.00	162	0.61
Site preparation	Off-Highway Trucks	4	8.00	381	0.57
Site preparation	Rubber Tired Dozers	0	8.00	358	0.59
Site preparation	Tractors/Loaders/Backhoes	0	8.00	75	0.55

Distribute straw bales on sand dunes	Cranes	0	7.00	208	0.43
Distribute straw bales on sand dunes	Forklifts	0	8.00	149	0.30
Distribute straw bales on sand dunes	Generator Sets	0	8.00	84	0.74
Distribute straw bales on sand dunes	Off-Highway Trucks	6	8.00	381	0.57
Distribute straw bales on sand dunes	Rubber Tired Dozers	2	8.00	358	0.59
Distribute straw bales on sand dunes	Rubber Tired Loaders	2	8.00	87	0.54
Distribute straw bales on sand dunes	Tractors/Loaders/Backhoes	2	8.00	75	0.55
Distribute straw bales on sand dunes	Welders	0	8.00	46	0.45
Planting and watering	Cranes	0	7.00	208	0.43
Planting and watering	Forklifts	0	8.00	149	0.30
Planting and watering	Generator Sets	0	8.00	84	0.74
Planting and watering	Off-Highway Trucks	30	8.00	381	0.57
Planting and watering	Rubber Tired Dozers	3	8.00	358	0.59
Planting and watering	Rubber Tired Loaders	2	8.00	87	0.54
Planting and watering	Tractors/Loaders/Backhoes	5	8.00	75	0.55
Planting and watering	Welders	0	8.00	46	0.45
Clean up and restoration	Off-Highway Trucks	7	8.00	381	0.57
Clean up and restoration	Rubber Tired Dozers	2	8.00	358	0.59
Clean up and restoration	Rubber Tired Loaders	2	8.00	87	0.54
Clean up and restoration	Tractors/Loaders/Backhoes	2	8.00	75	0.55
Operation and maintenance	Cranes	0	7.00	208	0.43
Operation and maintenance	Forklifts	0	8.00	149	0.30
Operation and maintenance	Generator Sets	0	8.00	84	0.74
Operation and maintenance	Off-Highway Trucks	5	8.00	381	0.57
Operation and maintenance	Rubber Tired Dozers	3	8.00	358	0.59
Operation and maintenance	Rubber Tired Loaders	0	8.00	87	0.54
Operation and maintenance	Tractors/Loaders/Backhoes	0	8.00	75	0.55
Operation and maintenance	Welders	0	8.00	46	0.45

ATVs	Off-Highway Trucks	10	8.00	50	0.38
ATVs	Rubber Tired Dozers	0	8.00	255	0.40
ATVs	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Water Trucks	Off-Highway Trucks	5	8.00	400	0.38
Water Trucks	Rubber Tired Dozers	0	8.00	255	0.40
Water Trucks	Tractors/Loaders/Backhoes	0	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site preparation	6	15.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Distribute straw bales on sand dunes	12	30.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Planting and watering	40	100.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Clean up and restoration	13	33.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Operation and maintenance	8	5.00	0.00	0.00	2.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
ATVs	10	11.25	0.00	0.00	2.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Water Trucks	5	6.00	0.00	0.00	2.20	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Replace Ground Cover

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Site preparation - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.1878	0.0000	1.1878	0.1283	0.0000	0.1283			0.0000			0.0000
Off-Road	8.9798	102.1234	45.5654	0.0926		4.4531	4.4531		4.0968	4.0968			9,822.9713	2.9028		9,883.9300
Total	**8.9798**	**102.1234**	**45.5654**	**0.0926**	**1.1878**	**4.4531**	**5.6408**	**0.1283**	**4.0968**	**4.2251**			**9,822.9713**	**2.9028**		**9,883.9300**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	0.1838	0.2287	2.7140	2.4700e-003	352.3795	2.5800e-003	352.3821	35.1690	2.3100e-003	35.1713			217.5106	0.0187		217.9040
Total	**0.1838**	**0.2287**	**2.7140**	**2.4700e-003**	**352.3795**	**2.5800e-003**	**352.3821**	**35.1690**	**2.3100e-003**	**35.1713**			**217.5106**	**0.0187**		**217.9040**

3.2 Site preparation - 2014

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0802	0.0000	0.0802	8.6600e-003	0.0000	8.6600e-003			0.0000			0.0000
Off-Road	8.9798	102.1234	45.5654	0.0926		4.4531	4.4531		4.0968	4.0968			9,822.9713	2.9028		9,883.9300
Total	**8.9798**	**102.1234**	**45.5654**	**0.0926**	**0.0802**	**4.4531**	**4.5332**	**8.6600e-003**	**4.0968**	**4.1055**			**9,822.9713**	**2.9028**		**9,883.9300**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	0.1838	0.2287	2.7140	2.4700e-003	215.7670	2.5800e-003	215.7696	21.5078	2.3100e-003	21.5101			217.5106	0.0187		217.9040
Total	**0.1838**	**0.2287**	**2.7140**	**2.4700e-003**	**215.7670**	**2.5800e-003**	**215.7696**	**21.5078**	**2.3100e-003**	**21.5101**			**217.5106**	**0.0187**		**217.9040**

3.3 Distribute straw bales on sand dunes - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					13.6268	0.0000	13.6268	6.7913	0.0000	6.7913			0.0000			0.0000
Off-Road	16.5961	187.6578	106.2621	0.1649		8.5889	8.5889		7.9017	7.9017			17,489.9157	5.1685		17,598.4533
Total	**16.5961**	**187.6578**	**106.2621**	**0.1649**	**13.6268**	**8.5889**	**22.2156**	**6.7913**	**7.9017**	**14.6931**			**17,489.9157**	**5.1685**		**17,598.4533**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	0.3675	0.4575	5.4281	4.9500e-003	704.7590	5.1500e-003	704.7641	70.3380	4.6300e-003	70.3427			435.0212	0.0375		435.8080
Total	**0.3675**	**0.4575**	**5.4281**	**4.9500e-003**	**704.7590**	**5.1500e-003**	**704.7641**	**70.3380**	**4.6300e-003**	**70.3427**			**435.0212**	**0.0375**		**435.8080**

3.3 Distribute straw bales on sand dunes - 2014

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.9198	0.0000	0.9198	0.4584	0.0000	0.4584			0.0000			0.0000
Off-Road	16.5961	187.6578	106.2621	0.1649		8.5889	8.5889		7.9017	7.9017			17,489.91 56	5.1685		17,598.45 33
Total	**16.5961**	**187.6578**	**106.2621**	**0.1649**	**0.9198**	**8.5889**	**9.5087**	**0.4584**	**7.9017**	**8.3602**			**17,489.91 56**	**5.1685**		**17,598.45 33**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	0.3675	0.4575	5.4281	4.9500e-003	431.5340	5.1500e-003	431.5392	43.0155	4.6300e-003	43.0202			435.0212	0.0375		435.8080
Total	**0.3675**	**0.4575**	**5.4281**	**4.9500e-003**	**431.5340**	**5.1500e-003**	**431.5392**	**43.0155**	**4.6300e-003**	**43.0202**			**435.0212**	**0.0375**		**435.8080**

3.4 Planting and watering - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					20.6380	0.0000	20.6380	10.2084	0.0000	10.2084			0.0000			0.0000
Off-Road	56.6676	660.5971	328.3427	0.6457		27.4494	27.4494		25.2534	25.2534			68,484.3837	20.2379		68,909.3792
Total	**56.6676**	**660.5971**	**328.3427**	**0.6457**	**20.6380**	**27.4494**	**48.0874**	**10.2084**	**25.2534**	**35.4618**			**68,484.3837**	**20.2379**		**68,909.3792**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	1.2251	1.5249	18.0936	0.0165	2,349.1966	0.0172	2,349.2138	234.4601	0.0154	234.4755			1,450.0706	0.1249		1,452.6933
Total	**1.2251**	**1.5249**	**18.0936**	**0.0165**	**2,349.1966**	**0.0172**	**2,349.2138**	**234.4601**	**0.0154**	**234.4755**			**1,450.0706**	**0.1249**		**1,452.6933**

3.4 Planting and watering - 2014

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.3931	0.0000	1.3931	0.6891	0.0000	0.6891			0.0000			0.0000
Off-Road	56.6676	660.5971	328.3427	0.6457		27.4494	27.4494		25.2534	25.2534			68,484.3837	20.2379		68,909.3792
Total	**56.6676**	**660.5971**	**328.3427**	**0.6457**	**1.3931**	**27.4494**	**28.8424**	**0.6891**	**25.2534**	**25.9425**			**68,484.3837**	**20.2379**		**68,909.3792**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	1.2251	1.5249	18.0936	0.0165	1,438.4467	0.0172	1,438.4639	143.3851	0.0154	143.4005			1,450.0706	0.1249		1,452.6933
Total	**1.2251**	**1.5249**	**18.0936**	**0.0165**	**1,438.4467**	**0.0172**	**1,438.4639**	**143.3851**	**0.0154**	**143.4005**			**1,450.0706**	**0.1249**		**1,452.6933**

3.5 Clean up and restoration - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					12.6381	0.0000	12.6381	6.6846	0.0000	6.6846			0.0000			0.0000
Off-Road	18.1031	205.6053	114.2105	0.1837		9.2765	9.2765		8.5344	8.5344			19,485.6814	5.7582		19,606.6043
Total	**18.1031**	**205.6053**	**114.2105**	**0.1837**	**12.6381**	**9.2765**	**21.9146**	**6.6846**	**8.5344**	**15.2190**			**19,485.6814**	**5.7582**		**19,606.6043**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	0.4043	0.5032	5.9709	5.4400e-003	775.2349	5.6700e-003	775.2406	77.3718	5.0900e-003	77.3769			478.5233	0.0412		479.3888
Total	**0.4043**	**0.5032**	**5.9709**	**5.4400e-003**	**775.2349**	**5.6700e-003**	**775.2406**	**77.3718**	**5.0900e-003**	**77.3769**			**478.5233**	**0.0412**		**479.3888**

3.5 Clean up and restoration - 2014

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.8531	0.0000	0.8531	0.4512	0.0000	0.4512			0.0000			0.0000
Off-Road	18.1031	205.6053	114.2105	0.1837		9.2765	9.2765		8.5344	8.5344			19,485.6814	5.7582		19,606.6043
Total	**18.1031**	**205.6053**	**114.2105**	**0.1837**	**0.8531**	**9.2765**	**10.1296**	**0.4512**	**8.5344**	**8.9856**			**19,485.6814**	**5.7582**		**19,606.6043**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	0.4043	0.5032	5.9709	5.4400e-003	474.6874	5.6700e-003	474.6931	47.3171	5.0900e-003	47.3222			478.5233	0.0412		479.3888
Total	**0.4043**	**0.5032**	**5.9709**	**5.4400e-003**	**474.6874**	**5.6700e-003**	**474.6931**	**47.3171**	**5.0900e-003**	**47.3222**			**478.5233**	**0.0412**		**479.3888**

3.6 Operation and maintenance - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.3294	0.0000	18.3294	9.9591	0.0000	9.9591			0.0000			0.0000
Off-Road	15.2723	176.0925	107.1947	0.1493		7.4822	7.4822		6.8837	6.8837			15,680.8591	4.6814		15,779.1684
Total	**15.2723**	**176.0925**	**107.1947**	**0.1493**	**18.3294**	**7.4822**	**25.8116**	**9.9591**	**6.8837**	**16.8427**			**15,680.8591**	**4.6814**		**15,779.1684**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	0.0300	0.0148	0.1765	1.5000e-004	10.0961	1.8000e-004	10.0963	1.0067	1.6000e-004	1.0068			12.6864	1.2400e-003		12.7124
Total	**0.0300**	**0.0148**	**0.1765**	**1.5000e-004**	**10.0961**	**1.8000e-004**	**10.0963**	**1.0067**	**1.6000e-004**	**1.0068**			**12.6864**	**1.2400e-003**		**12.7124**

3.6 Operation and maintenance - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.2372	0.0000	1.2372	0.6722	0.0000	0.6722			0.0000			0.0000
Off-Road	15.2723	176.0925	107.1947	0.1493		7.4822	7.4822		6.8837	6.8837			15,680.8591	4.6814		15,779.1684
Total	**15.2723**	**176.0925**	**107.1947**	**0.1493**	**1.2372**	**7.4822**	**8.7195**	**0.6722**	**6.8837**	**7.5559**			**15,680.8591**	**4.6814**		**15,779.1684**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	0.0300	0.0148	0.1765	1.5000e-004	10.0961	1.8000e-004	10.0963	1.0067	1.6000e-004	1.0068			12.6864	1.2400e-003		12.7124
Total	**0.0300**	**0.0148**	**0.1765**	**1.5000e-004**	**10.0961**	**1.8000e-004**	**10.0963**	**1.0067**	**1.6000e-004**	**1.0068**			**12.6864**	**1.2400e-003**		**12.7124**

3.6 Operation and maintenance - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.3294	0.0000	18.3294	9.9591	0.0000	9.9591			0.0000			0.0000
Off-Road	14.4214	163.6931	101.2404	0.1492		6.9342	6.9342		6.3794	6.3794			15,501.0814	4.6757		15,599.2706
Total	**14.4214**	**163.6931**	**101.2404**	**0.1492**	**18.3294**	**6.9342**	**25.2635**	**9.9591**	**6.3794**	**16.3385**			**15,501.0814**	**4.6757**		**15,599.2706**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	0.0270	0.0131	0.1555	1.5000e-004	10.0961	1.7000e-004	10.0963	1.0067	1.5000e-004	1.0068			12.2330	1.1000e-003		12.2562
Total	**0.0270**	**0.0131**	**0.1555**	**1.5000e-004**	**10.0961**	**1.7000e-004**	**10.0963**	**1.0067**	**1.5000e-004**	**1.0068**			**12.2330**	**1.1000e-003**		**12.2562**

3.6 Operation and maintenance - 2016

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.2372	0.0000	1.2372	0.6722	0.0000	0.6722			0.0000			0.0000
Off-Road	14.4214	163.6931	101.2404	0.1492		6.9342	6.9342		6.3794	6.3794			15,501.0813	4.6757		15,599.2705
Total	**14.4214**	**163.6931**	**101.2404**	**0.1492**	**1.2372**	**6.9342**	**8.1714**	**0.6722**	**6.3794**	**7.0517**			**15,501.0813**	**4.6757**		**15,599.2705**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	0.0270	0.0131	0.1555	1.5000e-004	10.0961	1.7000e-004	10.0963	1.0067	1.5000e-004	1.0068			12.2330	1.1000e-003		12.2562
Total	**0.0270**	**0.0131**	**0.1555**	**1.5000e-004**	**10.0961**	**1.7000e-004**	**10.0963**	**1.0067**	**1.5000e-004**	**1.0068**			**12.2330**	**1.1000e-003**		**12.2562**

3.6 Operation and maintenance - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.3294	0.0000	18.3294	9.9591	0.0000	9.9591			0.0000			0.0000
Off-Road	13.6241	152.2116	95.2252	0.1491		6.4152	6.4152		5.9020	5.9020			15,256.3702	4.6745		15,354.5352
Total	**13.6241**	**152.2116**	**95.2252**	**0.1491**	**18.3294**	**6.4152**	**24.7446**	**9.9591**	**5.9020**	**15.8611**			**15,256.3702**	**4.6745**		**15,354.5352**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	0.0241	0.0116	0.1364	1.5000e-004	10.0961	1.6000e-004	10.0962	1.0067	1.4000e-004	1.0068			11.7546	9.8000e-004		11.7752
Total	**0.0241**	**0.0116**	**0.1364**	**1.5000e-004**	**10.0961**	**1.6000e-004**	**10.0962**	**1.0067**	**1.4000e-004**	**1.0068**			**11.7546**	**9.8000e-004**		**11.7752**

3.6 Operation and maintenance - 2017

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.2372	0.0000	1.2372	0.6722	0.0000	0.6722			0.0000			0.0000
Off-Road	13.6241	152.2116	95.2252	0.1491		6.4152	6.4152		5.9020	5.9020			15,256.3702	4.6745		15,354.5352
Total	**13.6241**	**152.2116**	**95.2252**	**0.1491**	**1.2372**	**6.4152**	**7.6525**	**0.6722**	**5.9020**	**6.5743**			**15,256.3702**	**4.6745**		**15,354.5352**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	0.0241	0.0116	0.1364	1.5000e-004	10.0961	1.6000e-004	10.0962	1.0067	1.4000e-004	1.0068			11.7546	9.8000e-004		11.7752
Total	**0.0241**	**0.0116**	**0.1364**	**1.5000e-004**	**10.0961**	**1.6000e-004**	**10.0962**	**1.0067**	**1.4000e-004**	**1.0068**			**11.7546**	**9.8000e-004**		**11.7752**

3.7 ATVs - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.2631	0.0000	0.2631	0.0284	0.0000	0.0284			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.2631**	**0.0000**	**0.2631**	**0.0284**	**0.0000**	**0.0284**			**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	0.0676	0.0333	0.3971	3.4000e-004	22.7162	4.1000e-004	22.7166	2.2650	3.7000e-004	2.2654			28.5444	2.7800e-003		28.6028
Total	**0.0676**	**0.0333**	**0.3971**	**3.4000e-004**	**22.7162**	**4.1000e-004**	**22.7166**	**2.2650**	**3.7000e-004**	**2.2654**			**28.5444**	**2.7800e-003**		**28.6028**

3.7 ATVs - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0178	0.0000	0.0178	1.9200e-003	0.0000	1.9200e-003			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0178**	**0.0000**	**0.0178**	**1.9200e-003**	**0.0000**	**1.9200e-003**			**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	0.0676	0.0333	0.3971	3.4000e-004	22.7162	4.1000e-004	22.7166	2.2650	3.7000e-004	2.2654			28.5444	2.7800e-003		28.6028
Total	**0.0676**	**0.0333**	**0.3971**	**3.4000e-004**	**22.7162**	**4.1000e-004**	**22.7166**	**2.2650**	**3.7000e-004**	**2.2654**			**28.5444**	**2.7800e-003**		**28.6028**

3.7 ATVs - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.2631	0.0000	0.2631	0.0284	0.0000	0.0284			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.2631**	**0.0000**	**0.2631**	**0.0284**	**0.0000**	**0.0284**			**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	0.0607	0.0295	0.3499	3.4000e-004	22.7162	3.7000e-004	22.7166	2.2650	3.4000e-004	2.2654			27.5243	2.4800e-003		27.5764
Total	**0.0607**	**0.0295**	**0.3499**	**3.4000e-004**	**22.7162**	**3.7000e-004**	**22.7166**	**2.2650**	**3.4000e-004**	**2.2654**			**27.5243**	**2.4800e-003**		**27.5764**

3.7 ATVs - 2016

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0178	0.0000	0.0178	1.9200e-003	0.0000	1.9200e-003			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0178**	**0.0000**	**0.0178**	**1.9200e-003**	**0.0000**	**1.9200e-003**			**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	0.0607	0.0295	0.3499	3.4000e-004	22.7162	3.7000e-004	22.7166	2.2650	3.4000e-004	2.2654			27.5243	2.4800e-003		27.5764
Total	**0.0607**	**0.0295**	**0.3499**	**3.4000e-004**	**22.7162**	**3.7000e-004**	**22.7166**	**2.2650**	**3.4000e-004**	**2.2654**			**27.5243**	**2.4800e-003**		**27.5764**

3.7 ATVs - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.2631	0.0000	0.2631	0.0284	0.0000	0.0284			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.2631**	**0.0000**	**0.2631**	**0.0284**	**0.0000**	**0.0284**			**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	0.0542	0.0261	0.3068	3.3000e-004	22.7162	3.5000e-004	22.7165	2.2650	3.2000e-004	2.2653			26.4479	2.2100e-003		26.4943
Total	**0.0542**	**0.0261**	**0.3068**	**3.3000e-004**	**22.7162**	**3.5000e-004**	**22.7165**	**2.2650**	**3.2000e-004**	**2.2653**			**26.4479**	**2.2100e-003**		**26.4943**

3.7 ATVs - 2017

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0178	0.0000	0.0178	1.9200e-003	0.0000	1.9200e-003			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0178**	**0.0000**	**0.0178**	**1.9200e-003**	**0.0000**	**1.9200e-003**			**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	0.0542	0.0261	0.3068	3.3000e-004	22.7162	3.5000e-004	22.7165	2.2650	3.2000e-004	2.2653			26.4479	2.2100e-003		26.4943
Total	**0.0542**	**0.0261**	**0.3068**	**3.3000e-004**	**22.7162**	**3.5000e-004**	**22.7165**	**2.2650**	**3.2000e-004**	**2.2653**			**26.4479**	**2.2100e-003**		**26.4943**

3.8 Water Trucks - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.2631	0.0000	0.2631	0.0284	0.0000	0.0284			0.0000			0.0000
Off-Road	5.1535	60.6930	27.3002	0.0659		2.3183	2.3183		2.1328	2.1328			6,914.399 7	2.0642		6,957.748 7
Total	**5.1535**	**60.6930**	**27.3002**	**0.0659**	**0.2631**	**2.3183**	**2.5814**	**0.0284**	**2.1328**	**2.1612**			**6,914.399 7**	**2.0642**		**6,957.748 7**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	0.0349	0.0151	0.1805	1.4000e-004	2.7555	1.9000e-004	2.7557	0.2761	1.7000e-004	0.2763			12.2782	1.2600e-003		12.3047
Total	**0.0349**	**0.0151**	**0.1805**	**1.4000e-004**	**2.7555**	**1.9000e-004**	**2.7557**	**0.2761**	**1.7000e-004**	**0.2763**			**12.2782**	**1.2600e-003**		**12.3047**

3.8 Water Trucks - 2015

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0178	0.0000	0.0178	1.9200e-003	0.0000	1.9200e-003			0.0000			0.0000
Off-Road	5.1535	60.6930	27.3002	0.0659		2.3183	2.3183		2.1328	2.1328			6,914.3997	2.0642		6,957.7487
Total	**5.1535**	**60.6930**	**27.3002**	**0.0659**	**0.0178**	**2.3183**	**2.3360**	**1.9200e-003**	**2.1328**	**2.1347**			**6,914.3997**	**2.0642**		**6,957.7487**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	0.0349	0.0151	0.1805	1.4000e-004	2.3874	1.9000e-004	2.3876	0.2393	1.7000e-004	0.2395			12.2782	1.2600e-003		12.3047
Total	**0.0349**	**0.0151**	**0.1805**	**1.4000e-004**	**2.3874**	**1.9000e-004**	**2.3876**	**0.2393**	**1.7000e-004**	**0.2395**			**12.2782**	**1.2600e-003**		**12.3047**

3.8 Water Trucks - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.2631	0.0000	0.2631	0.0284	0.0000	0.0284			0.0000			0.0000
Off-Road	4.7097	54.2596	25.2699	0.0658		2.0470	2.0470		1.8833	1.8833			6,834.2226	2.0614		6,877.5130
Total	**4.7097**	**54.2596**	**25.2699**	**0.0658**	**0.2631**	**2.0470**	**2.3101**	**0.0284**	**1.8833**	**1.9117**			**6,834.2226**	**2.0614**		**6,877.5130**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	0.0314	0.0134	0.1592	1.4000e-004	2.7555	1.7000e-004	2.7557	0.2761	1.6000e-004	0.2763			11.8396	1.1200e-003		11.8632
Total	**0.0314**	**0.0134**	**0.1592**	**1.4000e-004**	**2.7555**	**1.7000e-004**	**2.7557**	**0.2761**	**1.6000e-004**	**0.2763**			**11.8396**	**1.1200e-003**		**11.8632**

3.8 Water Trucks - 2016

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0178	0.0000	0.0178	1.9200e-003	0.0000	1.9200e-003			0.0000			0.0000
Off-Road	4.7097	54.2596	25.2699	0.0658		2.0470	2.0470		1.8833	1.8833			6,834.2226	2.0614		6,877.5130
Total	**4.7097**	**54.2596**	**25.2699**	**0.0658**	**0.0178**	**2.0470**	**2.0648**	**1.9200e-003**	**1.8833**	**1.8852**			**6,834.2226**	**2.0614**		**6,877.5130**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	0.0314	0.0134	0.1592	1.4000e-004	2.3874	1.7000e-004	2.3875	0.2393	1.6000e-004	0.2395			11.8396	1.1200e-003		11.8632
Total	**0.0314**	**0.0134**	**0.1592**	**1.4000e-004**	**2.3874**	**1.7000e-004**	**2.3875**	**0.2393**	**1.6000e-004**	**0.2395**			**11.8396**	**1.1200e-003**		**11.8632**

3.8 Water Trucks - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.2631	0.0000	0.2631	0.0284	0.0000	0.0284			0.0000			0.0000
Off-Road	4.3599	49.1717	23.4268	0.0657		1.8254	1.8254		1.6793	1.6793			6,721.3123	2.0594		6,764.5596
Total	**4.3599**	**49.1717**	**23.4268**	**0.0657**	**0.2631**	**1.8254**	**2.0885**	**0.0284**	**1.6793**	**1.7077**			**6,721.3123**	**2.0594**		**6,764.5596**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	0.0281	0.0118	0.1397	1.4000e-004	2.7555	1.6000e-004	2.7557	0.2761	1.5000e-004	0.2763			11.3763	1.0000e-003		11.3973
Total	**0.0281**	**0.0118**	**0.1397**	**1.4000e-004**	**2.7555**	**1.6000e-004**	**2.7557**	**0.2761**	**1.5000e-004**	**0.2763**			**11.3763**	**1.0000e-003**		**11.3973**

3.8 Water Trucks - 2017

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0178	0.0000	0.0178	1.9200e-003	0.0000	1.9200e-003			0.0000			0.0000
Off-Road	4.3599	49.1717	23.4268	0.0657		1.8254	1.8254		1.6793	1.6793			6,721.3123	2.0594		6,764.5596
Total	**4.3599**	**49.1717**	**23.4268**	**0.0657**	**0.0178**	**1.8254**	**1.8431**	**1.9200e-003**	**1.6793**	**1.6813**			**6,721.3123**	**2.0594**		**6,764.5596**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Worker	0.0281	0.0118	0.1397	1.4000e-004	2.3874	1.6000e-004	2.3875	0.2393	1.5000e-004	0.2395			11.3763	1.0000e-003		11.3973
Total	**0.0281**	**0.0118**	**0.1397**	**1.4000e-004**	**2.3874**	**1.6000e-004**	**2.3875**	**0.2393**	**1.5000e-004**	**0.2395**			**11.3763**	**1.0000e-003**		**11.3973**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Recreational	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Recreational	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.298929	0.238852	0.201373	0.075588	0.027827	0.015800	0.016059	0.098716	0.001735	0.001573	0.014785	0.002226	0.006537

4.4 Fleet Mix

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**			**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**			**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.0000e-005	0.0000	1.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000			2.2000e-004	0.0000		2.3000e-004
Unmitigated	1.0000e-005	0.0000	1.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000			2.2000e-004	0.0000		2.3000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000			2.2000e-004	0.0000		2.3000e-004
Total	**1.0000e-005**	**0.0000**	**1.1000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**			**2.2000e-004**	**0.0000**		**2.3000e-004**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000			2.2000e-004	0.0000		2.3000e-004
Total	**1.0000e-005**	**0.0000**	**1.1000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**			**2.2000e-004**	**0.0000**		**2.3000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

KEELER DUNES DUST CONTROL PROJECT

DRAFT ENVIRONMENTAL IMPACT REPORT / ENVIRONMENTAL ASSESSMENT

VOLUME III

Prepared for:

Bureau of Land Management, Bishop Field Office
351 Pacu Lane Suite 100
Bishop, California 93514

and

Great Basin Unified Air Pollution Control District
157 Short Street
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Prepared by:

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Pasadena, California 91107

March 21, 2014

APPENDIX D
BIOLOGICAL RESOURCES TECHNICAL REPORT

KEELER DUNES DUST CONTROL PROJECT
BIOLOGICAL RESOURCES TECHNICAL REPORT

PREPARED FOR:

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT
157 SHORT STREET, SUITE 6
BISHOP, CA 93514-3537

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MARCH 21, 2014

TABLE OF CONTENTS

SECTIONS **PAGE**

TABLE ***PAGE***

FIGURE ***FOLLOWS PAGE***

APPENDICES

SECTION ES
EXECUTIVE SUMMARY

This Biological Resources Technical Report (BRTR) is based on biological surveys conducted in 2011, 2012, and 2013 and is supported by separate biological surveys conducted on Owens Lake in the 1990s and early 2000s. This BRTR determined that there would be no significant impacts to biological resources at the Keeler Dunes Dust Control Project (proposed project / proposed action) site. No major impacts are expected to occur due to current design and implementation of proposed dust control measures (DCMs). The DCMs will support the 2008 Supplemental Control Requirements for the 2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan through selective planting within the proposed project / proposed action site.

The purpose of the proposed project / proposed action, in combination with other ongoing dust control projects that have been and are being implemented on the lake bed, is to improve air quality through the reduction of particulate matter (PM_{10}) emissions throughout the Owens Valley Planning Area, consistent with the 2008 State Implementation Demonstration of Attainment Project. In particular, the purpose of the proposed project / proposed action is to reduce the exposure of residents of the communities of Keeler and Swansea to unhealthy levels of PM_{10} emissions. DCMs are necessary at the proposed project / proposed action site to bring the communities of Keeler and Swansea into compliance with the National Ambient Air Quality Standards (NAAQS) for PM_{10} by 2017.

Elements of the proposed project / proposed action include planting and establishment of native vegetation and placement of straw bales as a temporary wind break, as well as long-term air monitoring. A random pattern would be used for straw bale placement in order to mimic natural vegetation patterns. Initially, the dust control reduction would be achieved through the array of straw bales. Over time, dust control will be taken over by the plants as they grow and mature. In addition, the straw bales provide a protective environment for the plants. The long-term goal would be the establishment of a self-sustaining native vegetation cover to control dust with minimal maintenance. Continued air monitoring would be required, and minimal long-term maintenance would be anticipated.

Biological surveys led to the following determinations:

- Absence of any known jurisdiction of the U.S. Army Corps of Engineers (USACOE) pursuant to Section 404 of the Clean Water Act. These areas are emissive and, therefore, require treatment to reduce emissions. The USACOE National Environmental Policy Act (NEPA) implementing guidelines include a categorical exclusion for habitat restoration.
- Absence of vegetated wetlands, springs/seeps, or stream channels
- Absence of areas designated as critical habitat or included in a conservation plan for federally or state-listed rare, threatened, or endangered species; no avoidance and minimization measures would be warranted
- One locally important insect species, Owens dune weevil, is present; no avoidance and minimization measures would be required.
- Absence of threatened, endangered, or sensitive species observations; no avoidance and minimization measures would be required
- Absence of state-designated sensitive habitats. No avoidance and minimization measures would be required.

SECTION 1.0
INTRODUCTION

The Keeler Dunes Dust Control Project (proposed project / proposed action) is located approximately 65 miles south of the City of Bishop, 10 miles southeast of the community of Lone Pine, and 58 miles north of the City of Ridgecrest, lying adjacent to the 110-square-mile (70,000-acre) dry Owens Lake bed (Figure 1-1, *Regional Vicinity Map*). The proposed project / proposed action is located immediately northwest of the community of Keeler in Inyo County, California, and is approximately 194 acres. The proposed project / proposed action is encompassed by a much larger study area of approximately 870 acres (1.36 square miles) (Figure 1-2, *Project Study Area Location Map*). The study area is located on the Keeler alluvial fan situated between the base of the Inyo Mountains to the east-northeast and the dried bed of Owens Lake to the west-southwest. The study area extends approximately 2.5 miles to the northwest from the community of Keeler and is bisected by California State Route (SR) 136.

1.1 PROPOSED PROJECT / PROPOSED ACTION

The purpose of the proposed project / proposed action, in combination with other ongoing dust control projects that have been and are being implemented on the lake bed, is to improve air quality through the reduction of particulate matter (PM_{10}) emissions throughout the Owens Valley Planning Area (OVPA), consistent with the 2008 State Implementation Demonstration of Attainment Project. In particular, the purpose of this proposed project / proposed action is to reduce the exposure of residents of the communities of Keeler and Swansea to unhealthy levels of PM_{10} emissions. Dust control measures (DCMs) are necessary at the Keeler Dunes to bring these communities into compliance with the National Ambient Air Quality Standards (NAAQS) and state standards for PM_{10} by 2017.

Elements of the proposed project / proposed action include placement of straw bales as a temporary wind break, planting and establishment of native vegetation, and long-term air monitoring. The placement of straw bales and native plants on approximately 194 acres within the dunes would achieve 85 percent (17 acres) and 95 percent (177 acres) dust control efficiency. A random pattern would be used for straw bale placement, to mimic natural vegetation patterns. Cattle spinach (*Atriplex polycarpa*) and a mixture of other types of native vegetation will be planted. Initially, the dust control will be achieved through the array of straw bales. Over time, dust control will be taken over by the plants as they grow and mature. In addition, the straw bales provide a protected environment for the plants. Periodic watering of the plants in the springtime (March) may be needed in low-rainfall years for up to 3 years until vegetation is sufficiently established. The long-term goal of this DCM would be the establishment of a self-sustaining native vegetation cover to control dust with minimal long-term maintenance. Continued air monitoring would be required and minimal long-term maintenance would be anticipated with this DCM.

1.1.1 Elements

The DCM involves the establishment of a mix of native vegetation and straw bales within specified dust-emitting areas of the Keeler Dunes. The goal would be to create a natural vegetated dune environment that mimics comparable natural environments such as the existing Swansea Dunes (located to the northeast) and other stable shoreline dunes in the region. The establishment of native vegetation would act to prevent high emissions of dust by breaking up the wind and lowering the wind speed at the ground surface.

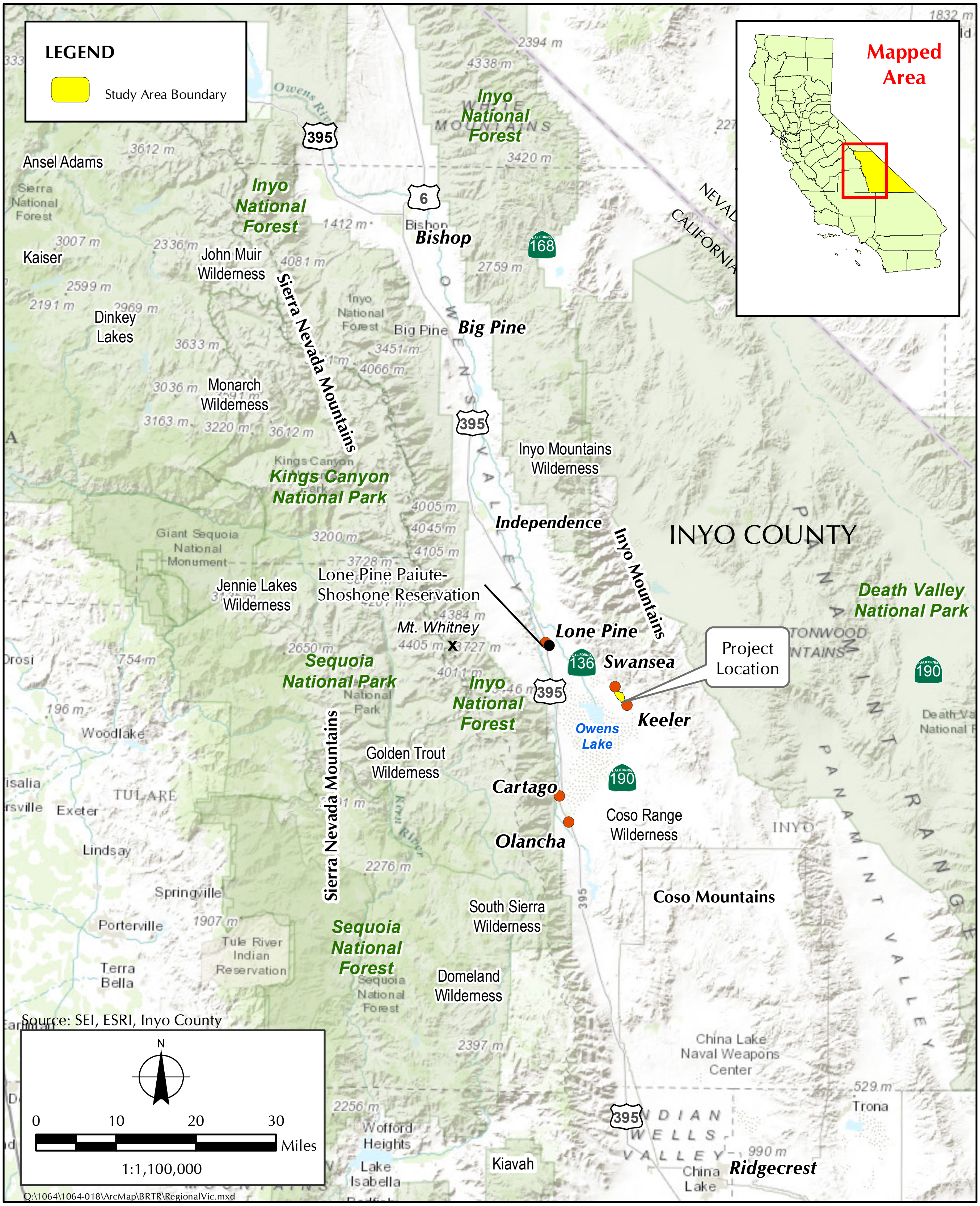

FIGURE 1-1
Regional Vicinity Map

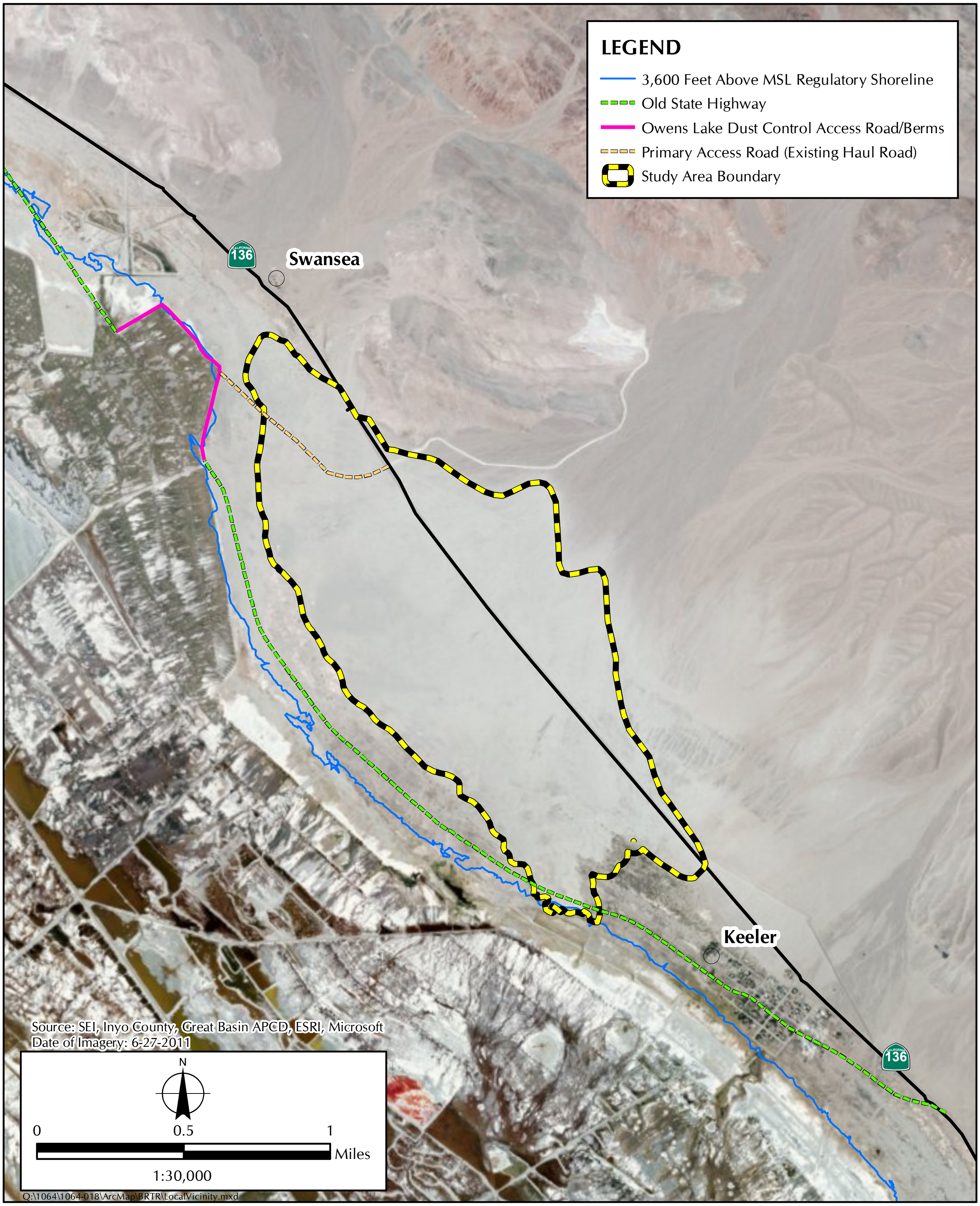

FIGURE 1-2

Project Study Area Location Map

Native Vegetation

This DCM involves the establishment of a mix of native vegetation within the dust-emitting areas shown on Figure 1.1.1-1, *Location of Infrastructure Elements Common to All Action Alternatives*. The goal would be to create a natural vegetated dune environment, similar to the existing Swansea Dunes and other stable shoreline dunes in the region that would act to prevent high emissions of dust by breaking up the wind and lowering the wind speed at the surface. The existing percent cover is estimated at 3 percent to 6 percent. The percentage of vegetative cover required for 85 percent and 95 percent dust control is 15 percent and 27.5 percent, respectively. The approximate number of plants and straw bales necessary to achieve an estimated 85 and 95 percent dust control efficiency is summarized in Table 1.1.1-1, *Dust Control Measure Elements*. Examples of native vegetation that may be planted at the dunes are shown in Table 1.1.1-2, *Native Vegetation List*.

TABLE 1.1.1-1
DUST CONTROL MEASURE ELEMENTS

Element	Minimum Control Efficiency (%)	Number of Acres	No. Required per Acre	Total No. Required
Native plants	95	177	1,983	350,991
Native plants	85	17	1,092	18,564
Total plants				**369,555**
Straw bales*	95	177	661	116,997
Straw bales*	85	17	364	6,188
Total straw bales				**123,185**

NOTE: * The dimensions of the straw bales are 24 x 16 x 48 inches or similar size.

TABLE 1.1.1-2
NATIVE VEGETATION LIST

Scientific Name	Common Name
Atriplex polycarpa (ATPO)	Cattle spinach, cattle saltbush
Atriplex confertifolia (ATCO)	Shadscale saltbush
Atriplex parryi (ATPA)	Parry's saltbush
Atriplex phyllostegia (ATPH)	Arrowscale
Cleomella obtusifolia (CLOB)	Mojave stinkweed, Mojave cleomella
Cleome sparsifolia (CLSP)	Fewleaf cleome, fewleaf spiderflower
Psathyrotes ramosissima (PSRA)	Turtleback
Sarcobatus vermiculatus (SAVE)	Greasewood
Suaeda moquinii (SUMO)*	Inkweed, Mojave seablite

**Sueada moquinii* is the old name for this species. The new name is currently *Suaeda nigra*. [1]

Atriplex polycarpa (ATPO; 66 percent) and a mixture of other types of native vegetation (33 percent) will be planted. Native plants will be cultivated in a nursery and will be approximately 15 centimeters in height. Planting will involve initial placement of a straw bale (see Other Elements below) followed by installation of native plants along the base of the straw bale. In addition, seeds of native plants may be dispersed in open areas between the straw bales.

[1] Jepson Flora Project (eds.) [2013] *Jepson eFlora*, http://ucjeps.berkeley.edu/IJM.html

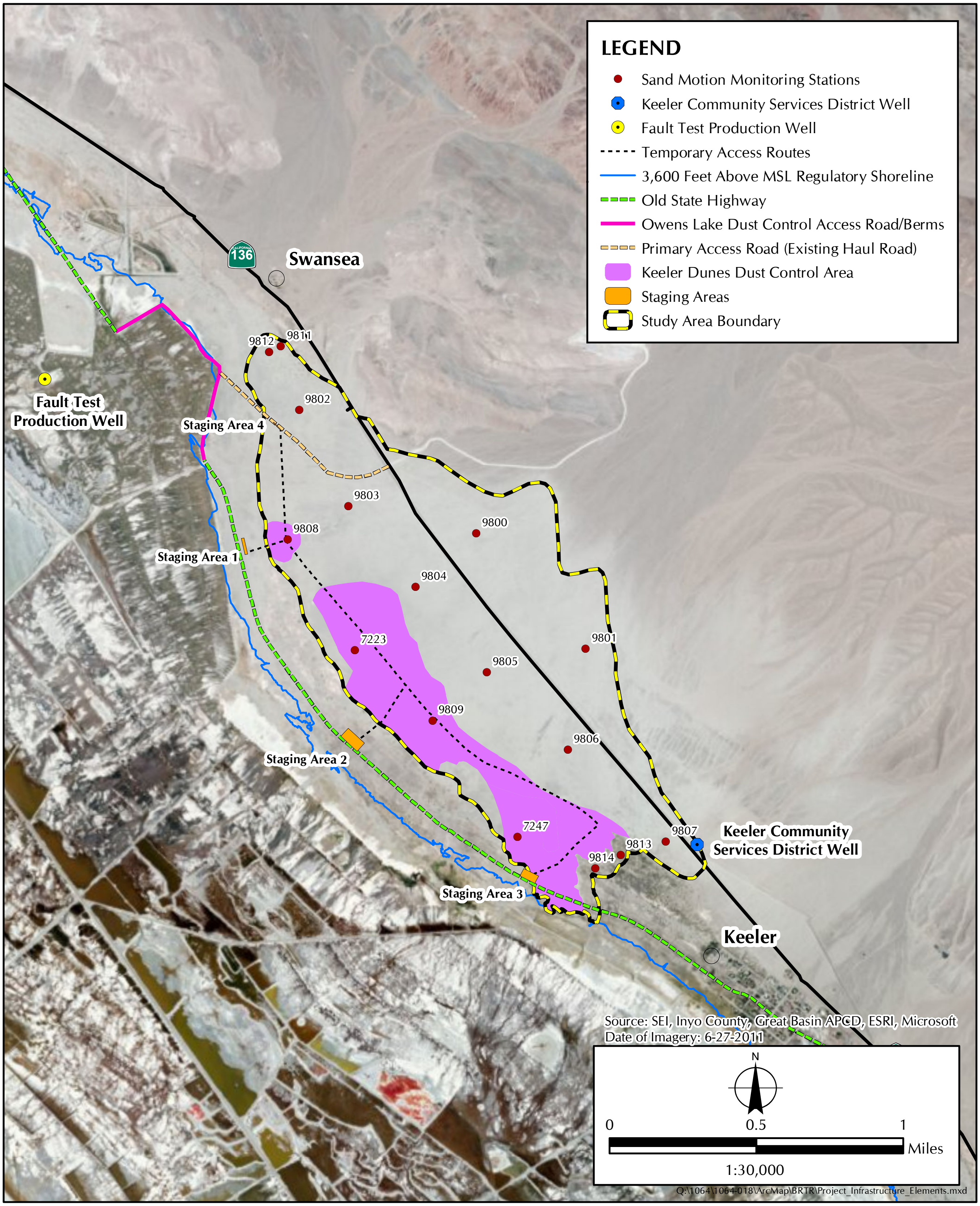

FIGURE 1.1.1-1

Location of Infrastructure Elements
Common to All Action Alternatives

Periodic watering of the plants is conservatively included in the description of the proposed project / proposed action for once per year for up to 3 years following the initial planting. It is anticipated that supplemental watering, if needed, would occur in March/April and in September/October.

Straw Bales

This is a temporary element of the dust control measure that would be used to stabilize emissive dust areas and provide a sheltered environment for plants during establishment. The proposed project / proposed action will utilize straw bales installed in an irregular pattern across the emissive areas. Table 1.1.1-1 provides the number of straw bales (24 x 16 x 48 inches or similar size) necessary for 85 and 95 percent dust control. All straw bales used at the dunes would be certified weed-free to minimize the threat from invasive weeds. Straw bales are anticipated to degrade over a period of several years and would provide organic material to the existing soil. Limited maintenance of straw bales (replacement of broken bales) is anticipated.

Other Elements

Other elements consist of infrastructure elements including temporary access routes; temporary staging areas for equipment, straw bales, and plants; a water storage tank; and an effectiveness monitoring program (existing air monitoring stations). The estimated time period for construction is approximately 11 months. Supplemental watering, if necessary, would be conducted in late winter / early spring and would require approximately 10 weeks to complete. More specific details of the proposed project / proposed action elements are detailed below.

Staging Areas

Four temporary staging areas will be established to provide contractor(s) with storage and placement of equipment, straw bales, native plants, supplies, and in Alternative 3 only, temporary water storage tanks. The staging area(s) will be located on land near the proposed project / proposed action area (Figure 1.1.1-1). The total area of the proposed staging areas is approximately 3.2 acres, all of which are considered temporary impacts. A portion of each staging area will have standard fencing installed to secure materials and equipment as necessary.

One main staging area (Staging Area 1) will be established within the northwestern edge of the proposed project / proposed action area on land administered by the BLM (Figure 1.1.1-1). Located immediately east of Old State Highway, the staging facility will measure 50 feet by 300 feet in area and will be used by the contractor(s) for the storage of equipment, fuel, all-terrain vehicles (ATVs), native plants, and other supplies.

Staging Area 2 will also be constructed for the proposed project / proposed action along the Old State Highway, on land managed by the LADWP (Figure 1.1.1-1). Staging area 2 will measure 200 feet by 400 feet and construction crew may park at this location.

Staging Area 3 is located on land managed by the BLM and will measure 150 feet by 300 feet, and has been designed to accommodate the ability for trucks to turn around. Both Staging Area 2 and 3 will be used for the temporary storage of equipment and materials needed for DCMs in the central and southern portions of the proposed project / proposed action area.

Staging Area 4 will be established adjacent to the gravel haul road constructed by the LADWP for dust mitigation on the Owens Lake, adjacent to the turn-off onto SR 136 (Figure 1.1.1-1). This staging area will be placed on previously disturbed land within the graveled limits of the existing road; thus, no vegetative removal is necessary. The area will measure approximately 10 feet by 200 feet and will be used primarily for temporary straw bale storage.

Staging Areas 1, 2, and 3 will require the brushing of vegetation in order for them to function. These staging areas will be restored and revegetated after the proposed project / proposed action has been completed.

Access Routes

A temporary access route for ATV travel will be constructed for use during placement of straw bales, planting, and watering activities. ATVs will be used to haul straw bales, plants, and water to the dust control areas. The temporary access route will be constructed without the use of supplemental materials such as asphalt or gravel. Following completion of planting and watering activities, the temporary access route will be restored utilizing straw bales and native plants for the dust control areas of the proposed project / proposed action. The temporary access route from the staging areas will be approximately 13,478 feet long (2.5 miles), 20 feet wide, and even with the existing grade (the total access route area is 6 acres of temporary impacts). The approximate location of access routes is shown in Figure 1.1.1-1.The proposed project / proposed action area can be accessed from SR 136 via the Gravel Haul Road and Old State Highway 136.

Water Supply, Conveyance, and Distribution

Approximately 5 gallons of water will be applied under each straw bale prior to planting.[2] The plants would also be watered with approximately 3 gallons of water per bale immediately after the plants are placed in the ground. Total water needs during planting are expected to amount to approximately 3.02 acre-feet (985,480 gallons). It is expected that supplemental watering may be provided to the plants during the first 3 years of the proposed project / proposed action when rainfall is less than 50 percent of the average annual rainfall or is needed based on poor plant health. A total of about 5.29 acre-feet of water may be applied during the first year of the proposed project / proposed action. During each of the second, third, years of the proposed project / proposed action the estimated total annual water duty would be about 2.27 acre-feet. The total water demand for the proposed project / proposed action and proposed project / proposed action alternatives is estimated at up to 9.83 acre-feet (3.2 million gallons) over the 3-year period (Table 2.1.5.2-2, *Water Requirements for Proposed Project / Proposed Action*.

[2] Groeneveld, D.P., HydroBio Advanced Remote Sensing. 12 September 2012. Telephone conversation with D. Grotzinger, Sapphos Environmental, Inc., Pasadena, CA.

TABLE 2.1.5.2-2
WATER REQUIREMENTS FOR PROPOSED PROJECT / PROPOSED ACTION

Irrigation Event	Year	Gallons per Bale	Gallons	Acre-feet
Initial irrigation	Fall 2014	5	615,925	1.89
Irrigation at time of planting	Fall 2014	3	369,555	1.13
Supplemental #1	Spring 2015	3	369,555	1.13
Supplemental #2	Fall 2015	3	369,555	1.13
Supplemental #3	Spring 2016	3	369,555	1.13
Supplemental #4	Fall 2016	3	369,555	1.13
Supplemental #5	Spring 2017	3	369,555	1.13
Supplemental #6	Fall 2017	3	369,555	1.13
		Total	**3,203,120**	**9.83**

During the time of planting there will be two irrigation events associated with planting. The first will be conducted prior to planting to pre-wet/pre-condition the soil. The second irrigation will be conducted immediately following planting of the shrubs. Additionally, during the first year of the proposed project / proposed action, the plants may be provided with supplemental water, if needed, in the spring time when they are breaking dormancy for the growing season and again in the late summer as they go into their late season growth spurt. A decision to provide supplemental water will be based on the precipitation and the overall health of the plants.

During each of the first, second, and third years of operation of the proposed project / proposed action, there may be up to two supplemental watering events. The decision to provide supplemental water will be based on the precipitation during the year and the overall health of the plants. The potential watering events will occur in the later winter / early spring and late summer/early fall.

The proposed project / proposed action and action alternatives 1, 2, 3, and 4 assume that the water for plant irrigation will be supplied from the District's 12-inch production well, located at the Fault Test Site, located about 0.7 mile northwest of the proposed project / proposed action boundary ((Figure 1.1.1-2, *Alternative 1, Dust Control Measures Applied to 214 Acres*; Figure 1.1.1-3, *Alternative 2, Dust Control Measures Applied to 197 Acres*; Figure 1.1.1-4, *Alternative 3, Manual Watering and Irrigation Schematic along Old State Highway*; Figure 1.1.1-5, *Alternative 4, Manual Watering and Irrigation Schematic along State Route 136*). The Fault Test well is an artesian (flowing) well and is capable of producing 250 gallons per minute (gpm) on a sustained basis.[3] An initial application of water at each straw bale installed in the dust control areas is expected to require approximately 985,480 gallons, which would be applied over a 2- to 4-month period (this includes the pre-planting watering as well as the watering at the time of planting). The Fault Test production well can produce a sustained flow rate of 250 gpm and thus only requires a total flow of 2.7 days to produce enough water for the initial watering. Flow tests conducted at the Fault Test Site have included continuous flows for periods up to 90 days with no observed impacts to the surrounding area. Thus production of the relatively small amount of water needed for the plants on the proposed project / proposed action would not be expected to cause impacts to the local area. Action alternative 5 identifies another available water source; purchased water from the Keeler Community Services District (KCSD) Well located within the southeastern portion of the proposed

[3] Holder, G., Great Basin Unified Air Pollution Control District, Bishop, CA. 9 October 2012. Telephone conversation with D. Grotzinger, Sapphos Environmental, Inc., Pasadena, CA.

project / proposed action study area (Figure 1.1.1-6, *Alternative 5, Manual Watering and Irrigation Schematic with KCSD Well*).[4]

Water will be transported to the proposed project / proposed action via water truck and transferred to small water storage tanks located at the four staging areas near the proposed project / proposed action area. Subsequent distribution to individual plants in the proposed project / proposed action would be conducted through hoses from small water tanks transported to the dust control areas via the access route.

As part of the proposed project / proposed action area alternatives, an irrigation system consisting of a network of rigid, above-ground, 2-inch and 4-inch PVC pipes is proposed be installed and constructed . The irrigation infrastructure will originate either from the four staging area tanks, three truck turnouts along Highway 136 or the Keeler Community Services District Well.

The temporary irrigation system would be designed such that irrigation laterals are placed every 150 feet across the site, rather than extending directly to each straw bale. The water from the lateral lines would be delivered to the plant locations through detachable hoses. This option includes travel into the proposed project /proposed action alternatives area by ATV from the staging areas to the hose attachment points along the lateral lines. Watering of individual plants in the vicinity of the hose attachment points will be conducted by a worker on foot. All travel associated with irrigation would be along the designated access routes and lateral lines. At locations where the access route crosses irrigation lines, temporary protective covers would be placed over the piping to allow travel over the system and prevent damage to the irrigation system. There would be approximately 124 total crossings of the irrigation lines (with 62 crossings of the 2-inch distribution laterals and 62 crossings of the 4-inch transmission line).

Effectiveness Monitoring Program

The Great Basin Unified Air Pollution Control District (District) is currently monitoring dust activity in the proposed project / proposed action area with a network of 16 sand motion monitoring sites (see Figure 1.1.1-1). The monitoring program will continue to operate during and after DCM implementation.

1.2 OBJECTIVES

The District regulates PM_{10} emissions in the OVPA consistent with the requirements of the NAAQS. The exposed dune sediments are dispersed into the air by prevailing winds, causing and contributing to exceedances of the NAAQS and California State Standard for PM_{10} in the community of Keeler.

The OVPA Revised 2008 State Implementation Plan[5] requires attainment of the NAAQS 24-hour PM_{10} standard by March 2017. Additionally, the District has a policy to achieve the California State PM_{10} standard within the District communities. The District and BLM identified and prioritized five basic objectives important to achieving the goals of the proposed project / proposed action:

[4] Holder, G., Great Basin Unified Air Pollution Control District, Bishop, CA. 20 September 2013. Email to Eric Charlton, Sapphos Environmental, Inc., Pasadena, CA.

[5] Great Basin Unified Air Pollution Control District. 2008. *2008 Owens Valley PM10 Planning Area Demonstration of Attainment State Implementation Plan*. Bishop, CA.

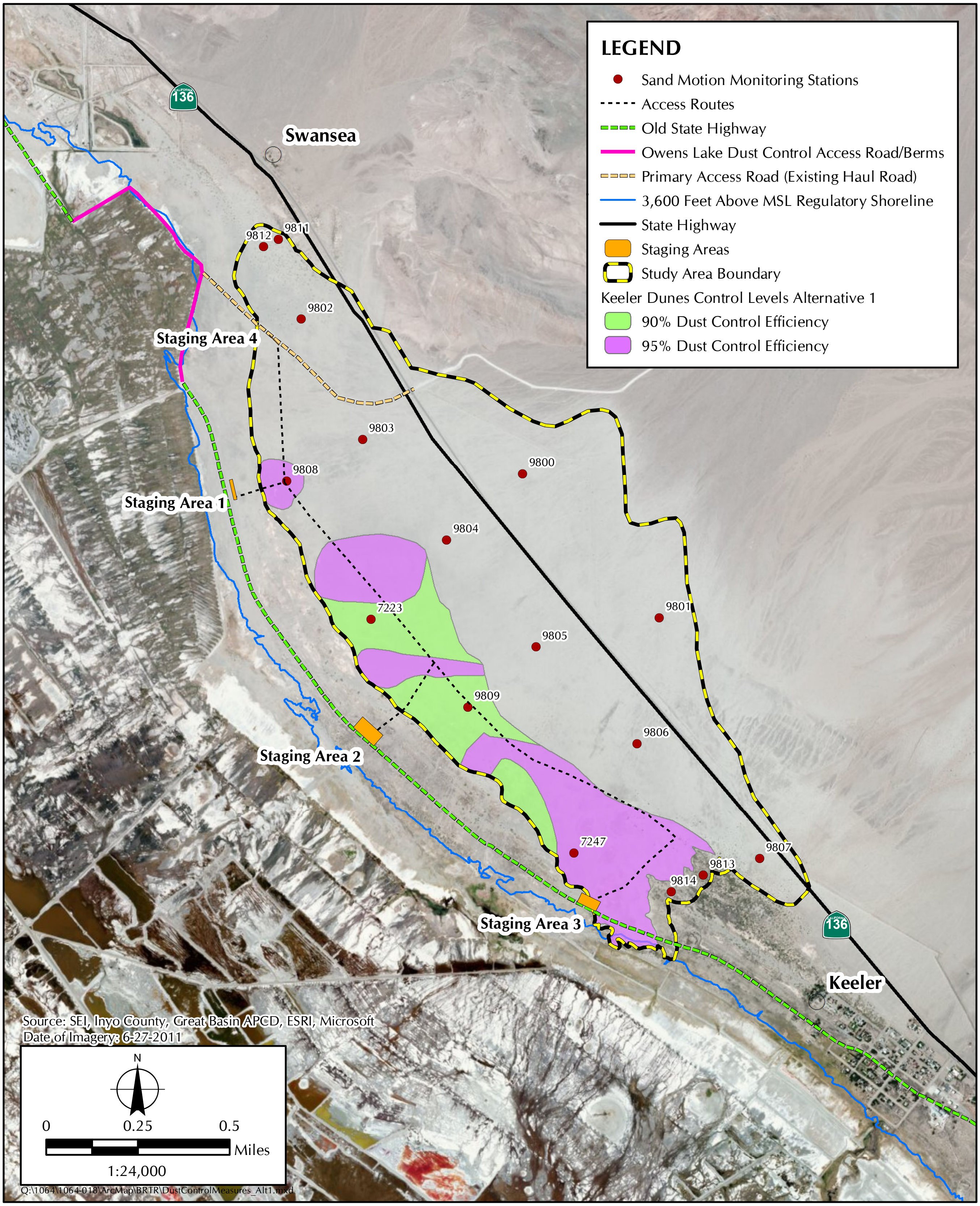

FIGURE 1.1.1-2

Alternative 1, Dust Control Measures Applied to 214 Acres

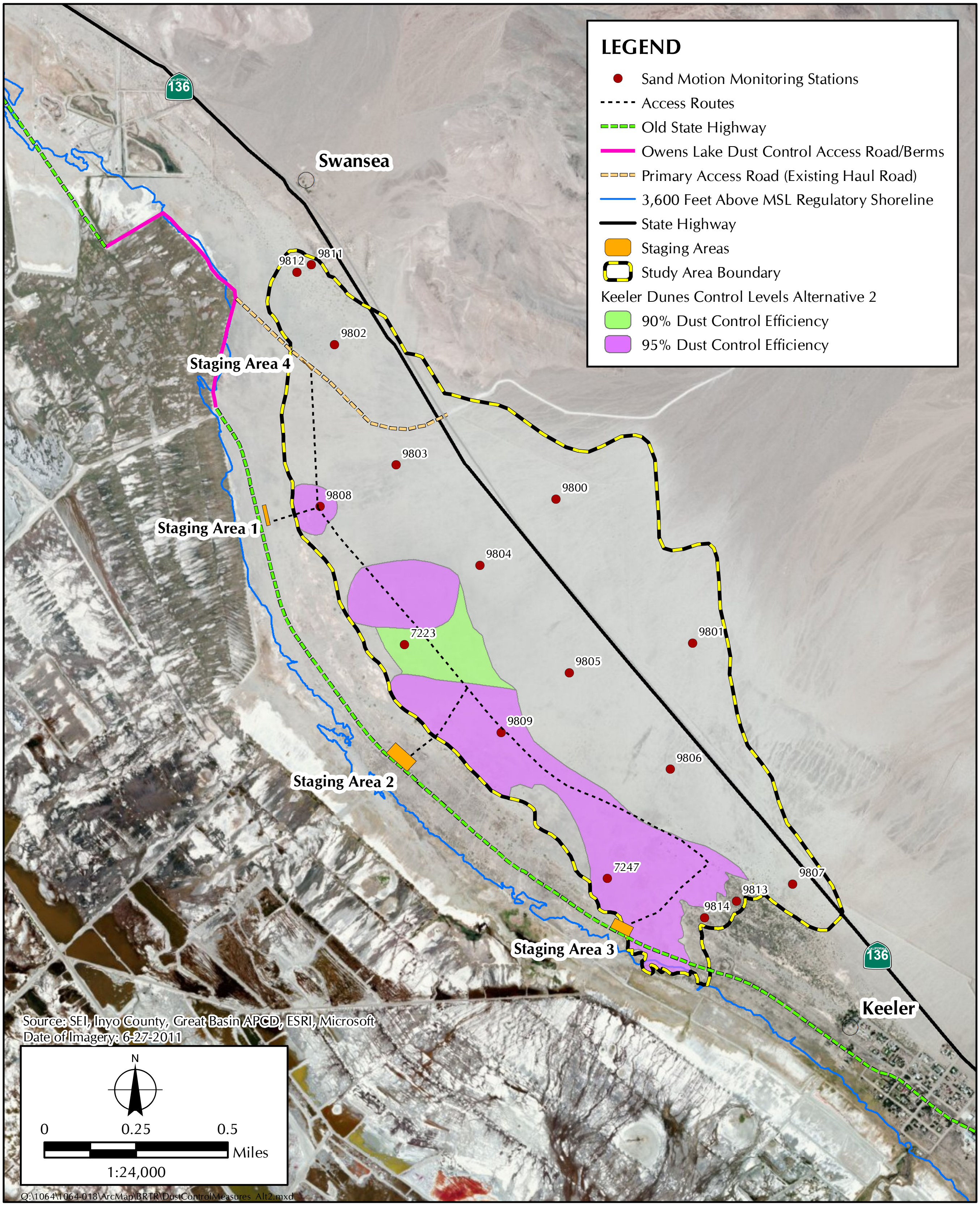

FIGURE 1.1.1-3
Alternative 2, Dust Control Measures Applied to 197 Acres

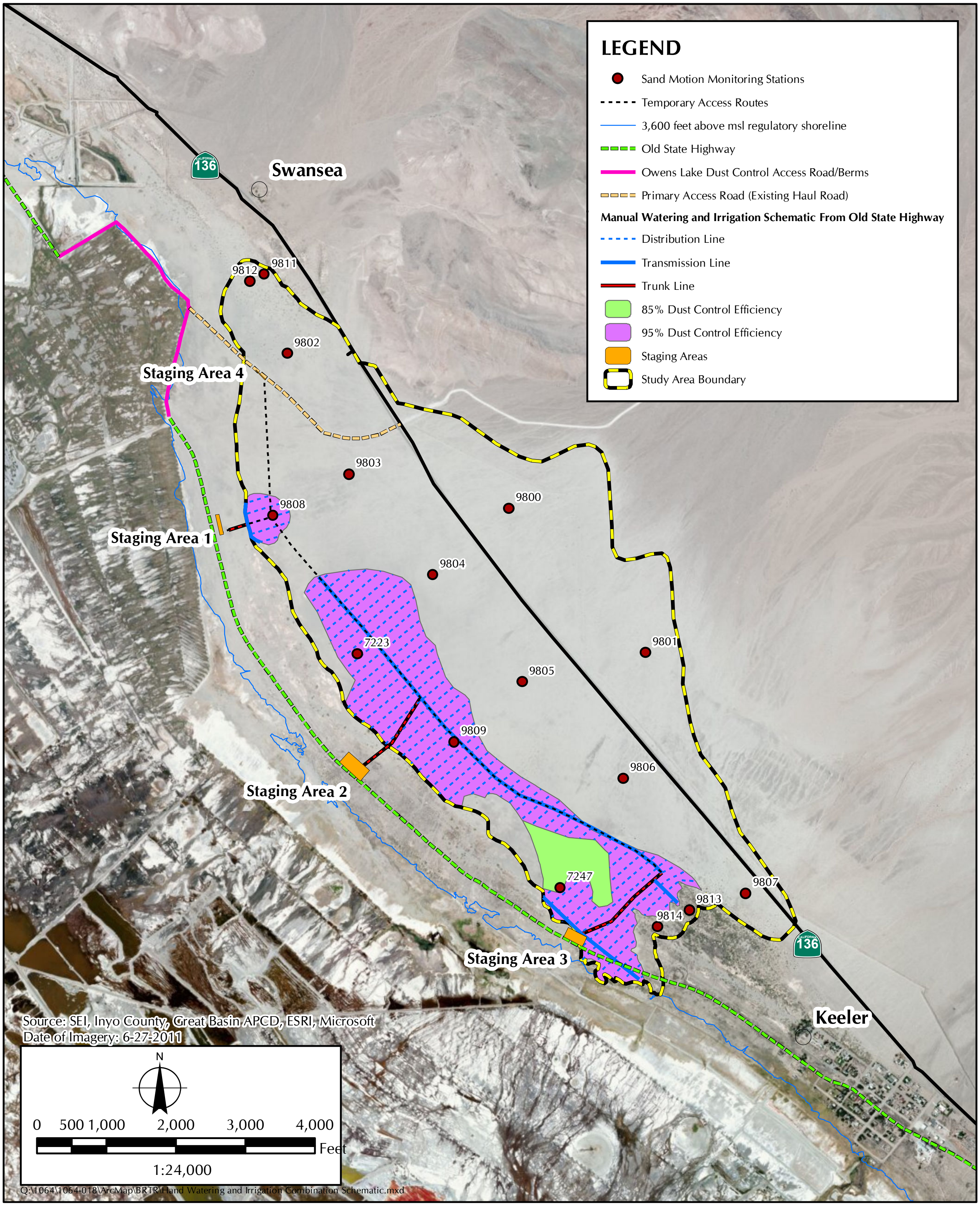

FIGURE 1.1.1-4

Alternative 3, Manual Watering and Irrigation Schematic From Old State Highway

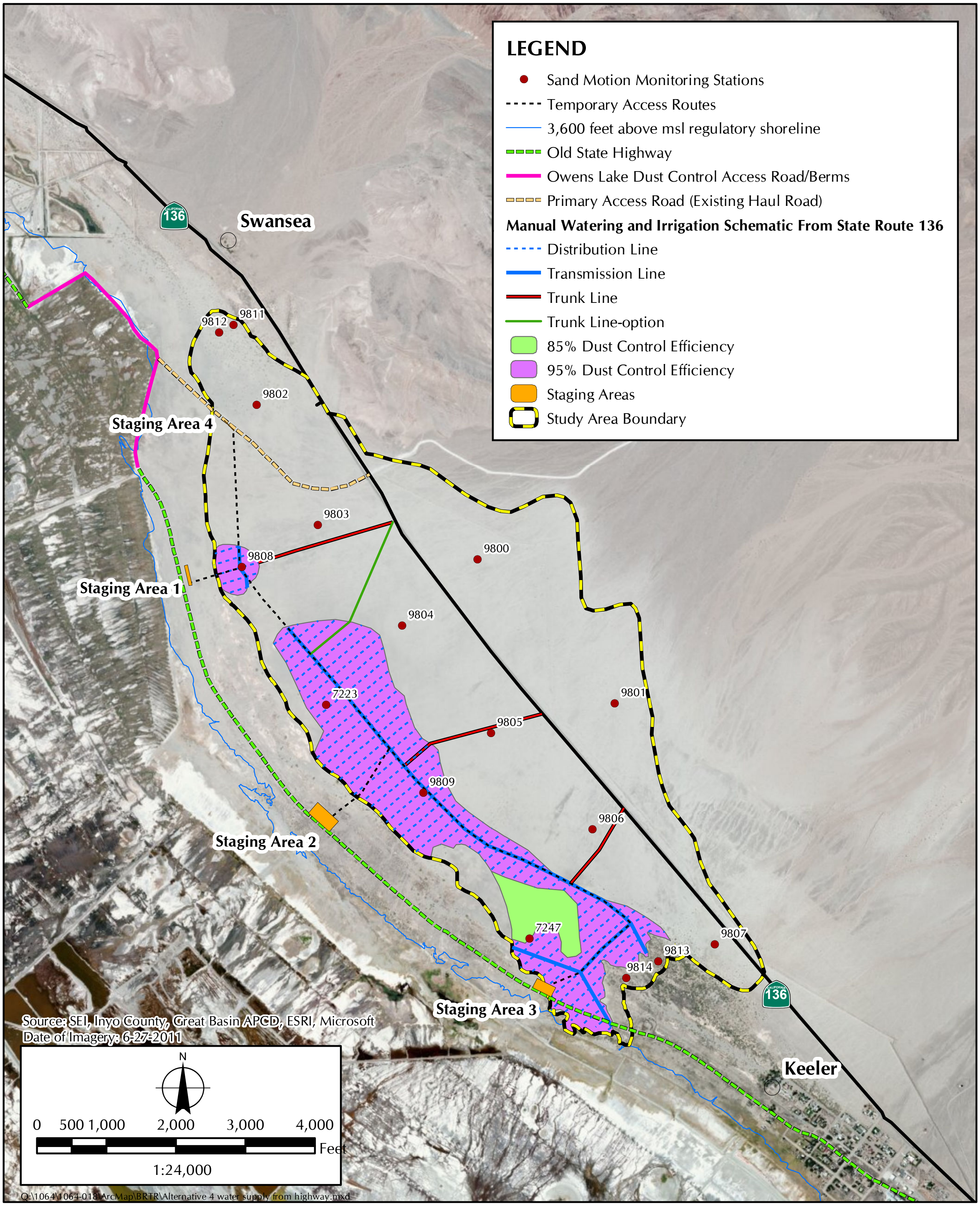

FIGURE 1.1.1-5

Alternative 4, Manual Watering and Irrigation Schematic From State Route 136

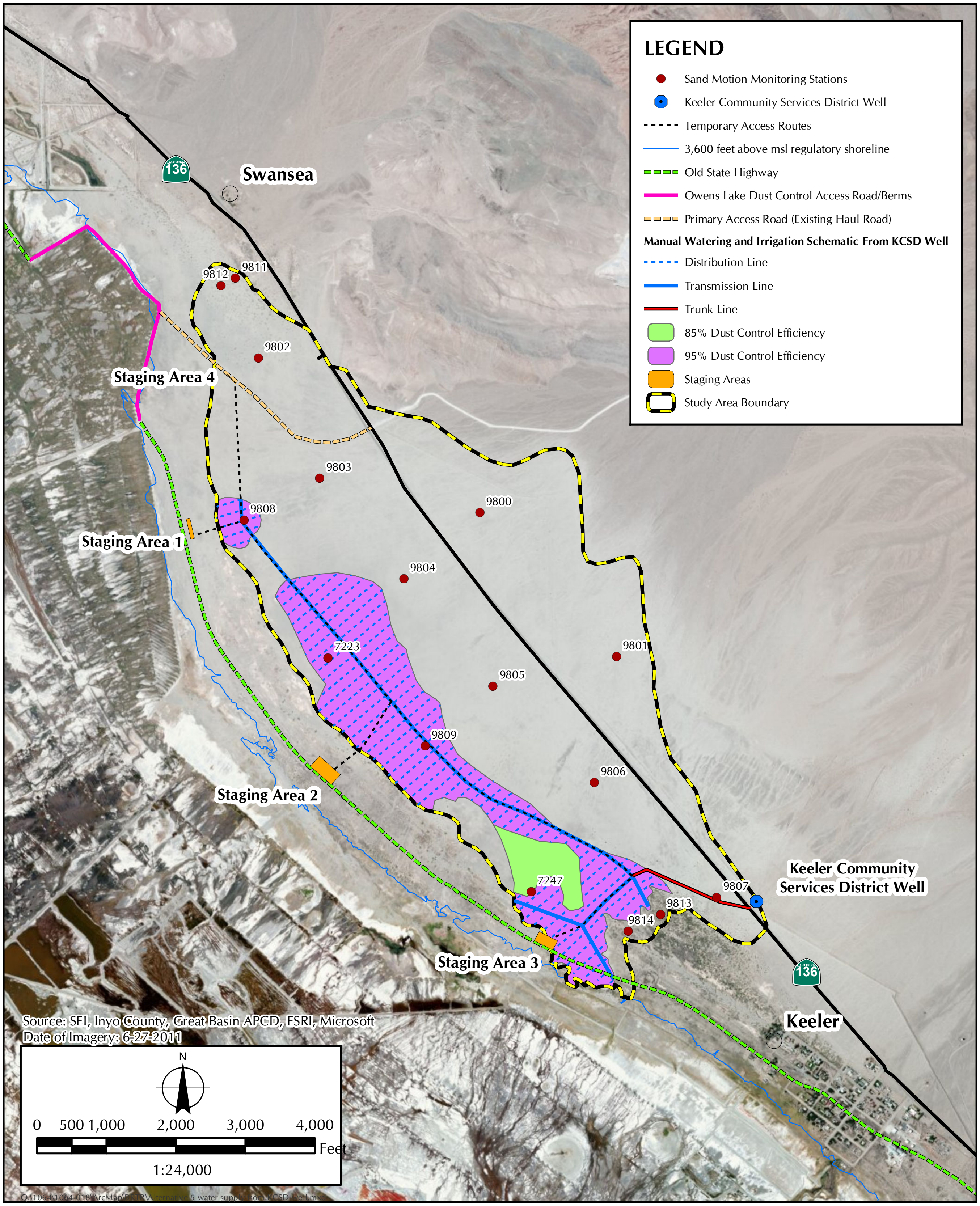

FIGURE 1.1.1-6

Alternative 5, Manual Watering and Irrigation Schematic From KCSD Well

- Reduce the levels of windblown dust that are causing and contributing to exceedances of the NAAQS and California State Standard for PM_{10} air pollution
- Attain NAAQS and state PM_{10} standards in the communities of Keeler and Swansea
- Minimize impacts to natural and cultural resources
- Create a landscape that is comparable to other natural stable dune environments in the region
- Create a landscape that is self-sustaining and can be operated with minimal resources

1.3 PURPOSE AND SCOPE

This BRTR will characterize and evaluate the biological resources that potentially would be affected by the implementation of the DCMs on the Keeler Dunes. In addition, land modifications required to accommodate the proposed project / proposed action constitute a project pursuant to the State of California Environmental Quality Act (CEQA) Guidelines and the National Environmental Policy Act (NEPA). Most of the Keeler Dunes land area is managed by the U.S. Department of the Interior, BLM. The District and the BLM Bishop Office are the joint lead agencies for the proposed project / proposed action pursuant to CEQA and NEPA.

The proposed project / proposed action would be subject to discretionary approval of the BLM and the District Governing Board. Acting in their capacity as lead agencies under CEQA, the District and BLM would need to determine the potential for the proposed project / proposed action to result in significant impacts to any biological resources.

This report constitutes the substantial evidence that was considered and evaluated to address the scope of analysis recommended in Appendix G of the State CEQA Guidelines, and required by the California Department of Fish and Wildlife (CDFW), the U.S. Fish and Wildlife Service (USFWS), the Inyo County General Plan, the Bishop Resource Management Plan Record of Decision, and zoning ordinances related to biological resources. It also addresses areas potentially subject to the jurisdiction of the U.S. Army Corps of Engineers (USACOE) pursuant to Section 404 of the Clean Water Act; riparian and other state-designated sensitive habitats, including those requiring a Streambed Alteration Agreement pursuant to Section 1600 of the State Fish and Game Code. A determination of special-status species and designated critical habitat; native resident or migratory species of fish and wildlife; and the consideration of federal, state, and regional conservation plans are also addressed in this report.

SECTION 2.0 METHODS

This section of the BRTR describes the methods employed in the characterization and evaluation of biological resources at the proposed project / proposed action site. The study methods were designed to provide the substantial evidence required to address the scope of analysis recommended regarding biological resources in Appendix G of the State CEQA Guidelines and the NEPA, including other related federal, state, and local statutes and regulations. Coordination was undertaken with resource agencies to further evaluate the potential presence of special-status species.

Prior to conducting field surveys within the proposed project / proposed action site, a query of the California Natural Diversity Database (CNDDB)[1] and a review of the California Native Plant Society (CNPS) database were undertaken to identify special-status species, including listed, sensitive, and locally important species with the potential to occur within, and adjacent to, the proposed project / proposed action site. The query was conducted for the following nine U.S. Geological Survey (USGS) 7.5-minute series topographic quadrangles: Bartlett,[2] Dolomite,[3] Keeler,[4] Lone Pine,[5] Owens Lake,[6] Cerro Gordo Peak,[7] Olancha,[8] Vermillion Canyon,[9] and Centennial Canyon;[10] as well as an additional two surrounding 7.5-minute series topographic quadrangles, Union Wash[11] and Haiwee Reservoirs.[12] The typical CNDDB search included any quadrangle that is directly adjacent to the quadrangle that contains the proposed project / proposed action site. A preliminary analysis of sensitive species using 11 quadrants was pared down to potential considerations based on proximity and habitat constraints, producing 61 species (Appendix A, *Potential Sensitive Species*). Further consideration, based on the change in elevation of habitats in adjacent quadrangles when compared to the proposed project / proposed action site and while comparing each species' habitats to the characteristics present within the proposed project / proposed action site, produced the 27 more closely scrutinized candidates detailed within Section 5.0, *Result and Discussions*. Reviewed literature included the following: *Bishop Resource Management Plan Record of Decision*;[13] the Conservation and Open Space Element of the Inyo

[1] California Department of Fish and Game. 2005. *Rarefind 3: A Database Application for the Use of the California Department of Fish and Game Natural Diversity Database*. Sacramento, CA.

[2] U.S. Geological Survey. 1987. *7.5-Minute Series, Bartlett, California, Topographic Quadrangle*. Denver, CO.

[3] U.S. Geological Survey. 1987. *7.5-Minute Series, Dolomite, California, Topographic Quadrangle*. Denver, CO.

[4] U.S. Geological Survey. 1987. *7.5-Minute Series, Keeler, California, Topographic Quadrangle*. Denver, CO.

[5] U.S. Geological Survey. 1994. *7.5-Minute Series, Lone Pine, California, Topographic Quadrangle*. Denver, CO.

[6] U.S. Geological Survey. 1987. *7.5-Minute Series, Owens Lake, California, Topographic Quadrangle*. Denver, CO.

[7] U.S. Geological Survey. 1987. *7.5-Minute Series, Cerro Gordo Peak, California, Topographic Quadrangle*. Denver, CO.

[8] U.S. Geological Survey. 1987. *7.5-Minute Series, Olancha, California, Topographic Quadrangle*. Denver, CO.

[9] U.S. Geological Survey. 1987. *7.5-Minute Series, Vermillion Canyon, California, Topographic Quadrangle*. Denver, CO.

[10] U.S. Geological Survey. 1987. *7.5-Minute Series, Centennial Canyon, California, Topographic Quadrangle*. Denver, CO.

[11] U.S. Geological Survey. 1982. *7.5-Minute Series, Union Wash, California Topographic Quadrangle*. Denver, CO.

[12] U.S. Geological Survey. 1982. *7.5-Minute Series, Haiwee Reservoirs, California Topographic Quadrangle*. Denver, CO.

[13] Bureau of Land Management. 1993. *Bishop Resource Management Plan Record of Decision*. Bishop, CA.

County General Plan;[14] previously completed environmental documentation, including field efforts conducted between April 2002 and May 2006 in preparation of the *2008 Owens Valley PM10 Planning Area Demonstration of Attainment State Implementation Plan*;[15] and *Rare Plant Survey Report Owens Dry Lake Dust Control Project Site*.[16]

Focused field surveys of the Keeler Dunes were conducted by a team of six biologists (one botanist, four wildlife biologists, and one entomologist). General biological surveys were conducted on April 12–13, 2011, June 6, 2012, and July 23, 2013. During the field visits, observations and recordings of plant and wildlife species, as well as plant communities, were documented using a number of methods including, but not limited to, terrestrial photographs, aerial support photographs, and global positioning system (GPS) units. Habitat assessment was performed to document the presence or absence of habitat suitable to support special-status species and communities within the proposed project / proposed action site, as well as to provide a baseline description of existing biological resources. The limited size of the proposed project / proposed action site allowed for 100 percent of the area to be surveyed by foot.

2.1 WETLANDS

The determination regarding the potential presence or absence of federally protected wetlands were reviewed using topographic maps and National Wetlands Inventory (NWI) maps, interpretation of aerial photographs, spatial analysis using geographic information systems (GIS) software, and plant community mapping along with field analysis conducted concurrent with the habitat assessment (Figure 2.1-1, *National Wetlands Inventory Map*). All potential wetlands identified on the NWI map were visited in the field to verify presence or absence, along with habitat functions and values. During ground-truthing, three essential criteria were looked for in evaluating the site for wetlands: (1) hydrophytic (wetland) vegetation; (2) hydric soils; and (3) wetlands hydrology, which is the presence of water at or above the soil surface for a sufficient period of the year to significantly influence the plant types and soils that occur in the area, where hydric soils have characteristics that indicate they were developed in conditions where soil oxygen was limited by the presence of saturated soil for long periods during the growing season.[17,18]

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[14] Inyo County Planning Department. December 2001. *Inyo County General Plan, Conservation and Open Space Element*. Independence, CA.

[15] Schade, Theodore D., et al. *2008 Owens Valley PM10 Planning Area Demonstration of Attainment State Implementation Plan*. Bishop, CA: Great Basin Unified Air Pollution Control District.

[16] City of Los Angeles Department of Water and Power. 2001. *Rare Plant Survey Report Owens Dry Lake Dust Control Project Sites*. Los Angeles, CA.

[17] U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, U.S. Army Corps of Engineers, and U.S. Department of Agriculture Soil Conservation Service. 1989. *Federal Manual for Identifying and Delineating Jurisdictional Wetlands*. An Interagency Cooperative Publication. Washington, DC.

[18] U.S. Army Corps of Engineers. n.d. "Recognizing Wetlands – An Informational Pamphlet." Available at: http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits/techbio.aspx

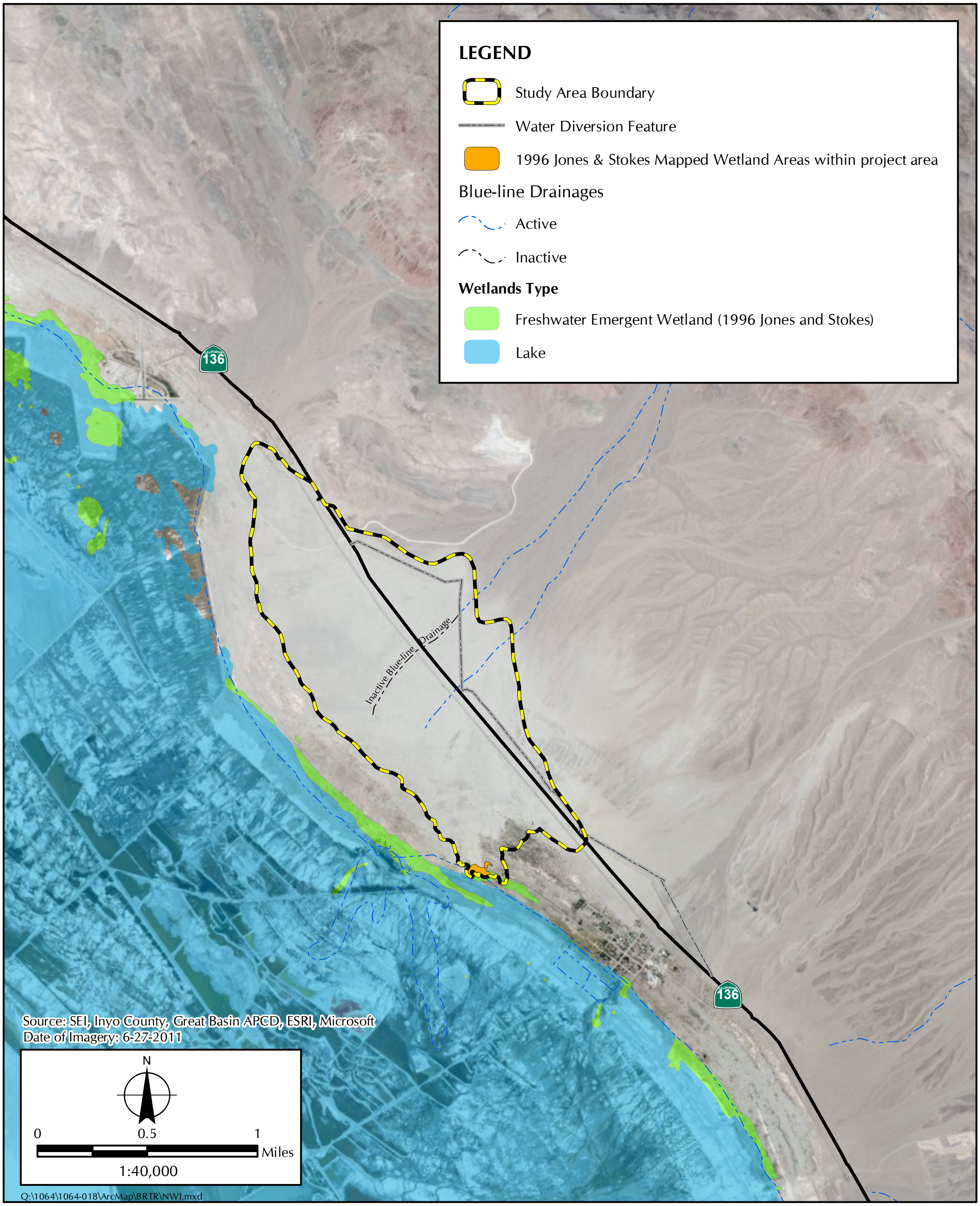

FIGURE 2-1
National Wetlands Inventory Map

2.2 PLANT COMMUNITIES

The evaluation of plant communities was undertaken in a two-phase effort consisting of a preliminary, data-driven field mapping effort on the CNPS rapid assessment protocol,[19] followed by verification and refinement of the field map in-house. The final plant community map was constructed on the field identification of regional assemblages of vegetation characterized by the presence of dominant plant species.[20] The vegetation assemblages described in this report follow a system used by the CDFW, the Sawyer and Keeler-Wolf classification,[21] rather than Holland classification.[22] The Sawyer and Keeler-Wolf classification focuses on floristics (i.e., the group of plant species occurring on a site) and dominance (i.e., which species are most abundant and which are less common) as the basis for their system.[23] Delineation of plant communities follows the current (2003) classification system of CDFW, the CNDDB of the State Resources Agency,[24] and was cross-referenced with Sawyer and Keeler-Wolf's *A Manual of California Vegetation*.[25] Where applicable, the plant community descriptions provided in *Preliminary Descriptions of the Terrestrial Natural Communities of California*[26] was used. Botanical names and common names used are according to *The Jepson Manual*.[27] Common names not available from *The Jepson Manual* are taken from Calflora.[28] Plant community surveys were completed in accordance with the CDFW protocol for special status plants.[29]

If no plants were visible, the area was marked as barren. If plants were visible, the field crews walked to all patches and determined species composition and estimated abundance. During field surveys, 13 photo stations were selected at strategic points throughout the site. At each photo station, four pictures were taken (Appendix B, *Photo Station Pictures*), one in each cardinal direction (Figure 2.2-1, *Photo Stations Map*).

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[19] California Native Plant Society Vegetation Committee. September 2004. *California Native Plant Society Vegetation Rapid Assessment Protocol*. Sacramento, CA. Available at: http://www.cnps.org/cnps/vegetation/pdf/rapid_assessment_protocol.pdf

[20] Munz, Philip A., and D.D. Keck. 1949. "California Plant Communities." *El Aliso*, *2*(1): 87–105.

[21] Sawyer, J.O., and T. Keeler-Wolf. 1995. *A Manual of California Vegetation*. Sacramento: California Native Plant Society.

[22] Holland, R.F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California*. Sacramento, CA: California Department of Fish and Game.

[23] Sawyer, J.O., and T. Keeler-Wolf. 1995. *A Manual of California Vegetation*. Sacramento, CA: California Native Plant Society.

[24] California Department of Fish and Game, Wildlife and Habitat Data Analysis Branch. September 2003. *List of California Terrestrial Natural Communities Recognized by the California Natural Diversity Database*. Sacramento, CA. Available at: http://www.dfg.ca.gov/whdab/html/natural_communities.html

[25] Sawyer, J.O., and T. Keeler-Wolf. 1995. *A Manual of California Vegetation*. Sacramento, CA: California Native Plant Society.

[26] Holland, Robert F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California*. Sacramento, CA: California Department of Fish and Game.

[27] Hickman, J.C., ed. 1993. *The Jepson Manual: Higher Plants of California*. Berkeley, CA: University of California Press.

[28] Calflora. n.d. Calflora Database. Available at: http://www.calflora.org. This database is continually updated, so it is an appropriate source of names for new species not described in *The Jepson Manual*.

[29] California Department of Fish and Wildlife. 2009. *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Communities*. Available at: http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/Protocols_for_Surveying_and_Evaluating_Impacts.pdf

2.3 VERTEBRATE COMMUNITY

Wildlife population assessment was undertaken by Sapphos Environmental, Inc. biologists (Ms. Lauren Dorough, Mr. John Ivanov, and Mr. Ryan Villanueva). The limited size of the proposed project / proposed action site allowed for 100 percent of the area to be surveyed by foot, and pedestrian surveys were supplemented by driving accessible roads around the entire site during the early morning hours and late afternoon hours. Identification of wildlife species was aided by the use of photography, binoculars, and a spotting scope.

While conducting pedestrian surveys, biological survey crews assessed habitat for special-status species and relevant habitat was scrutinized for target species. Invertebrates and reptiles were searched for by visually inspecting the ground and turning over rocks, as well as searching under vegetation. A visual and auditory search was performed for birds. Mammals were surveyed by sight and investigation of diagnostic sign (i.e., track, scat, nests, and burrows). All wildlife species were identified to taxonomic level and compiled into a compendium (Appendix C, *Floral and Faunal Compendium*).

2.4 INVERTEBRATE COMMUNITY

To survey for insects, nonlethal pitfall traps were placed along several transects. Pitfall traps were checked in the morning, evening, and throughout the night to sufficiently sample insects during different activity periods. Pitfall traps (6.7 × 6.7 × 3.1 inches) were located in a grid across the dune area, replicating the various habitat types (Figure 2.4-1, *Insect Sampling Locations*). Each trap was filled with a biodegradable, soapy water solution (<1 percent soap), which breaks surface tension, so that insects remain in the traps. Twenty-six traps were located within the area. In addition, nocturnal surveys used light sampling, which often attracts species that would not be detected in pitfalls. One two-sided white sheet and light source (propane lantern) were set at a central location near the alkali flats, near trap #7. This light was set at dusk and remained until dawn, with periodic monitoring throughout the night.

Dr. Sharon Martinson (contract entomologist) conducted surveys for summer insects at Keeler Dunes between May 3–4, 2011, and May 28–31, 2012. In addition, Dr. Sharon Martinson and Mr. Brian J. Bielfelt conducted surveys for *Tescalsia giulianiata*, a winter moth, between January 7 and January 13, 2012. Due to the number of traps and breadth of area sampled, each monitoring of the pitfall traps took 4 to 5 hours to complete (a single transect was about 6 miles' total linear distance). All traps were set between 2:00 p.m. and 7:00 p.m., sampled between 9:00 p.m. and 2:00 a.m., and sampled again between 6:00 a.m. and 11:00 a.m. All traps were removed, and displaced sand was returned to the holes.

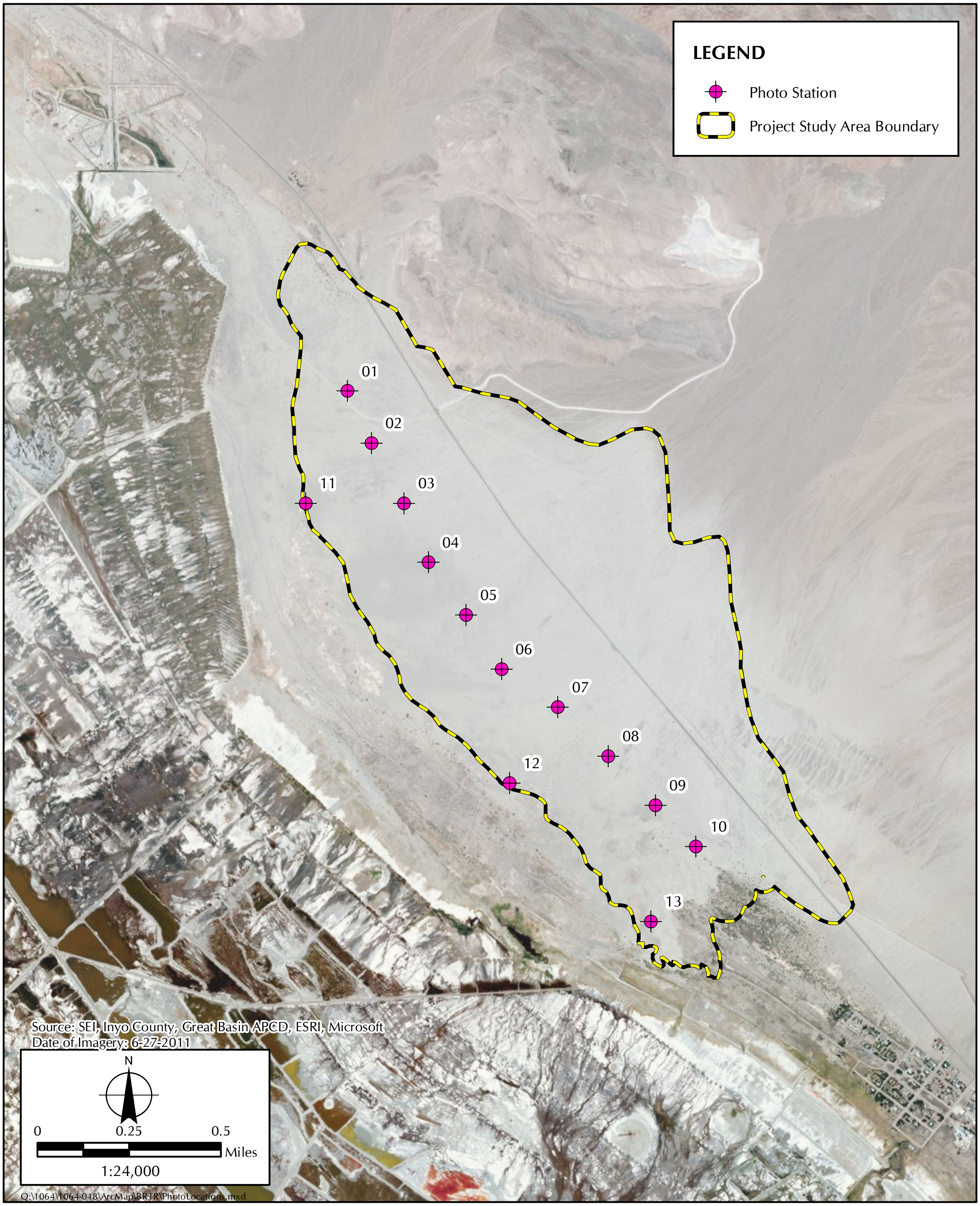

FIGURE 2.2-1

Photo Stations Map

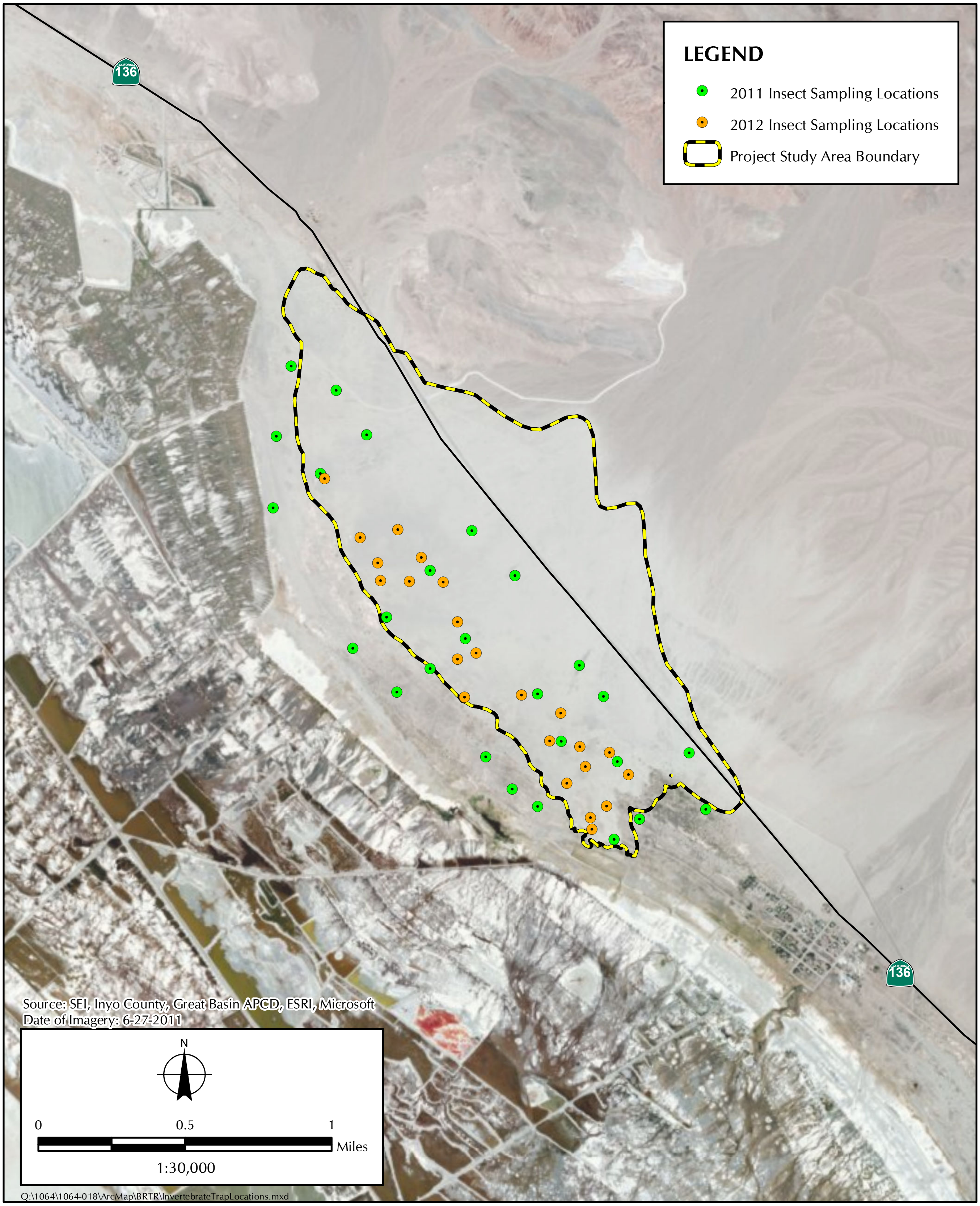

FIGURE 2.4-1

Insect Sampling Locations

SECTION 3.0
REGULATORY FRAMEWORK

This regulatory framework identifies the federal, state, and local statutes, ordinances, or policies governing the conservation and protection of biological resources that must be considered by the Great Basin Unified Air Pollution Control District (District) Governing Board and the Bureau of Land Management (BLM) Bishop Field Office during the decision-making process for projects that have the potential to affect biological resources.

3.1 FEDERAL

3.1.1 National Environmental Policy Act

The National Environmental Policy Act (NEPA) and its supporting federal regulations establish certain requirements that must be adhered to for any project "financed, assisted, conducted, or approved by a federal agency." The BLM is the lead agency pursuant to NEPA for the lands that it administers in the proposed action area. The U.S. Army Corps of Engineers (USACOE) would be the lead agency pursuant to NEPA for that portion of the proposed action requiring the issuance of a nationwide or individual permit under Section 404 of the Clean Water Act. The proposed action area contains wetlands that are subject to USACOE jurisdiction.

3.1.2 Federal Endangered Species Act

The purposes of the federal Endangered Species Act (ESA) are to provide a means to conserve the ecosystems on which endangered and threatened species depend and to provide a program for conservation and recovery of these species. The ESA defines species as endangered and threatened and provides regulatory protection for any species thus designated. Section 9 of the ESA prohibits the take of species that are listed by the U.S. Fish and Wildlife Service (USFWS) as threatened or endangered. As defined in the ESA, "take" means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in such conduct." In recognition that take cannot always be avoided, Section 10(a) of the ESA includes provisions for take that is incidental to, but not the purpose of, otherwise lawful activities. Section 10(a)(1)(B) permits (Incidental Take Permits) may be issued if take is incidental and does not jeopardize the survival and recovery of the species in the wild. No species listed under the ESA have been identified with the potential to occur near or within the proposed action study area.

Section 7(a)(2) of the ESA requires all federal agencies, including the USFWS, to evaluate the proposed action with respect to any species proposed for listing or already listed as endangered or threatened and their critical habitat, if any is proposed or designated. Federal agencies must undertake programs for the conservation of endangered and threatened species and are prohibited from authorizing, funding, or carrying out any action that will jeopardize a listed species or destroy or modify its critical habitat.

As defined in the federal ESA, "individuals, organizations, states, local governments, and other non-Federal entities are affected by the designation of critical habitat only if their actions occur on Federal lands, require a Federal permit, license, or other authorization, or involve Federal funding."

3.1.3 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 USC 668–668c), enacted in 1940 and as amended, prohibits anyone, without a permit issued by the USFWS, from "taking" bald and golden eagles, including their parts, nests, or eggs. The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." For purposes of these guidelines, "disturb" means: "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

3.1.4 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) makes it unlawful to pursue, capture, kill, or possess or attempt to do the same to any migratory bird or part, nest, or egg of any such bird listed in wildlife protection treaties among the United States, Great Britain, Mexico, Japan, and the countries of the former Soviet Union. As with federal ESA, the MBTA authorizes the Secretary of the Interior to issue permits for incidental take. Nesting birds and the contents of the nest within the construction area of the proposed action study area are protected pursuant to the MBTA.

3.1.5 Section 404 of the Federal Clean Water Act

The proposed action does not involve any wetlands or other designated waters of the United States, nor does it involve any potential wetland designated on the National Wetlands Inventory (NWI). Wetlands designated on the NWI are present along the western border of the proposed action study area but occur outside impact areas.

3.1.6 Bishop Resource Management Plan

The BLM is the predominant land owner in the Keeler Dunes area. The Keeler Dunes are located within the Owens Lake Management Area and South Inyo Management Area, two of nine management areas managed by the BLM pursuant to the Bishop Resource Management Plan.[1] The proposed DCMs would be implemented within the Owens Lake Management Area, with the exception of the KCSD well tank (Alternative 5), which is located within the South Inyo Management Area. The BLM's responsibilities include managing public land and associated natural resources to provide a variety of uses. The Bishop Resource Management Plan provides planning direction for the future use of land in the Bishop Resource Area. Policies relevant to the proposed action include the following:

RMP Decision

Provide Yearlong Protection of endangered, threatened, candidate and sensitive plant and animal habitats. Yearlong Protection is defined in the RMP as: No discretionary actions which would adversely affect target resources would be allowed.

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[1] U.S. Department of the Interior, Bureau of Land Management, Bakersfield District. 1993. *Bishop Resource Management Plan Record of Decision*. Bakersfield, CA.

Wildlife

1. Consult with the California Department of Fish and Wildlife (CDFW) prior to design and accomplishment of wildlife habitat improvement projects.
2. Notify the CDFW one year in advance of any revegetation or vegetation manipulation projects.
3. Manage candidate species, sensitive species and other species of management concern in a manner to avoid the need for listing as state or federal endangered or threatened species.

In addition, the Bishop Resource Management Plan has identified several goals and decisions that apply to the Owens Lake Management Area, which includes the dry Owens Lake bed and surrounding areas including the proposed action study area west of Highway 136. The plan states the following Decisions:

- Maintain and enhance habitat for Owens pupfish, Owens tui chub, western snowy plover, Owens Valley vole and Owens sand dune snout beetle.
- Enhance wildlife habitat and watershed conditions with the following Desired Plant Community (DPC) prescriptions:
  - Meet DPC goals on 3,214 acres (75 percent) of total dune habitat to maintain habitat for the Owens sand dune snout beetle.

The DPC for Sand Dunes in the Owens Lake and South Inyo Management Areas is:

- Desired plant community for stabilized and partially stabilized desert dunes along the periphery of Owens Lake: The goal is to insure adequate vegetative cover and microclimatic conditions for the Category 2 species *Trigonoscuta owensi*, Owens sand dune snout beetle. Dunes and sand accumulations would be maintained through retention of present vegetative cover which varies from scant cover of widely scattered shrubs and herbs to nearly closed shrub canopies. Plants which predominate in the dune areas and are primarily responsible for stabilization of dune hummocks are Parry's saltbush (*Atriplex parryi*), greasewood (*Sarcobatus vermiculatus*), bush seepweed (*Suaeda moquinii*). Maintain the current overall vegetative cover of approximately 7 percent in the dune habitat.

3.2 STATE

3.2.1 California Endangered Species Act

The California ESA (CESA) prohibits the take of listed species except as otherwise provided in state law. Unlike the federal ESA, CESA applies the take prohibitions to species petitioned for listing (state candidates). State lead agencies are required to consult with CDFW to ensure that any actions undertaken by that lead agency are not likely to jeopardize the continued existence of any state-listed species or result in destruction or degradation of required habitat. CDFW is authorized to enter into memoranda of understanding with individuals, public agencies, universities, zoological gardens, and scientific or educational institutions to import, export, take, or possess listed species for scientific, educational, or management purposes. CESA was considered due to the potential presence of state-listed rare, threatened, or endangered species within the region of the proposed project study area. One species listed under CESA has been identified with the potential to occur near or within the proposed project study area.

3.2.2 State Fish and Wildlife Code

The proposed project does not involve any river, stream, lake, ephemerally flooded dry washes, or altered or artificial waterways that provide benefits to fish and wildlife resources. There is one active drainage in the proposed project study area that brings water that is captured by the southern diversion berm and directs it through a series of channels that cross through the Keeler Dunes. Neither the main active drainage nor its series of channels contain riparian habitat. Additionally, the drainage and channels occur outside proposed project impact areas.

3.2.3 Sections 2080 and 2081 of the State Fish and Game Code

Section 2080 of the State Fish and Wildlife Code (Code) states that "no person shall import into [California], export out of this state, or take, possess, purchase, or sell within this state, any species, or any part or product thereof, that the [State Fish and Wildlife Commission] determines to be an endangered species or threatened species, or attempt any of those acts, except as otherwise provided in this chapter, the Native Plant Protection Act, or the California Desert Native Plants Act."

Under Section 2081 of the Code, the CDFW may authorize individuals or public agencies to import, export, take, or possess, any state-listed endangered, threatened, or candidate species. These otherwise prohibited acts may be authorized through permits or memoranda of understanding if (1) the take is incidental to an otherwise lawful activity, (2) impacts of the authorized take are minimized and fully mitigated, (3) the permit is consistent with any regulations adopted pursuant to any recovery plan for the species, and (4) the applicant ensures adequate funding to implement the measures required by CDFW. CDFW shall make this determination based on the best scientific and other information that is reasonably available and shall include consideration of the species' capability to survive and reproduce. Section 2081 of the State Fish and Wildlife Code was considered due to the potential presence of state-listed rare, threatened, or endangered species within the region of the proposed project study area. Several species listed under the CESA have been identified with the potential to occur near or within the proposed project study area.

3.2.4 Sections 3503 and 3503.5 of the State Fish and Game Code

Sections 3503 and 3503.5 of the State Fish and Wildlife Code provide regulatory protection to resident and migratory birds and all birds of prey within the state. These sections prohibit take of nests and eggs unless other provided for by the State Fish and Wildlife Code.

3.2.5 Native Plant Protection Act

The Native Plant Protection Act includes measures to preserve, protect, and enhance rare and endangered native plants. The definitions of rare and endangered differ from those contained in CESA. However, the list of native plants afforded protection pursuant to the Native Plant Protection Act includes those listed as rare and endangered under CESA. The Native Plant Protection Act provides limitations on take as follows: "No person shall import into this state, or take, possess, or sell within this state" any rare or endangered native plant, except in compliance with provisions of the act. Individual land owners are required to notify the CDFW at least 10 days in advance of changing land uses to allow the CDFW to salvage any rare or endangered native plant material. The Native Plant Protection Act was considered in this analysis due to the potential presence of state-listed rare, threatened, or endangered plant species in the region of the proposed project study area. Several species listed under the Native Plant Protection Act have been identified with the potential to occur near or within the proposed project study area.

3.2.6 California Desert Native Plants Act

The California Desert Native Plants Act applies to the private and public lands that are not administered by the BLM or any other Federal agency. The California Desert Native Plants Act was passed in 1981 to protect non-listed California desert native plants from unlawful harvesting on both publicly and privately owned lands. Harvest, transport, sale, or possession of specific native desert plants is prohibited unless a person has a valid permit, or wood receipt, and the required tags and seals.

3.3 COUNTY

3.3.1 Inyo County General Plan

Conservation and Open Space Element

The Conservation and Open Space Element of the Inyo County General Plan contains policies related to biological resources.[2] The Conservation and Open Space Element contains a summary of the existing conditions in the planning area, major issues, and policies designed to aid the County to achieve its goals. The two goals identified by the County for biological resources include:

- **GOAL BIO-1.** Maintain and enhance biological diversity and healthy ecosystems in the county.

- **GOAL BIO-2**. Provide a balanced approach to resource protection and recreational use of the natural environment.

Biological resources policies relevant to the proposed project include the following:

- **Policy BIO-1.1, Regulatory Compliance.** The County shall review development proposals to determine impacts to sensitive natural communities, of both local and regional concern, and special-status species. Appropriate mitigation measures will be incorporated into each project, as necessary.

- **Policy BIO-1.2, Preservation of Riparian Habitat and Wetlands.** Important riparian areas and wetlands, as identified by the County, shall be preserved and protected for biological resource value.

- **Policy BIO-1.3, Restoration of Biodiversity.** Encourage the restoration of degraded biological communities.

- **Policy BIO-1.4, Limitations for ERAs.** The County shall discourage development in Environmental Resource Areas (ERA).

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[2] Inyo County Planning Department. December 2001. *Inyo County General Plan, Conservation and Open Space Element*. Independence, CA.

- **Policy BIO-1.5, Develop Outside of Habitat Areas.** Work with regulatory agencies and private developers to direct development into less significant habitat areas. Discourage urban development in areas containing sensitive natural communities or known to contain special-status species.

- **Policy BIO-1.6, Wildlife Corridors.** The County shall work to preserve and protect existing wildlife corridors where appropriate.

- **Policy BIO-1.7, Noxious Weeds.** Avoid activities that will promote the spread of noxious weeds in the County.

- **Policy BIO-1.8, Owens River Restoration.** The County will work with the LADWP and regulatory agencies to complete the restoration of habitat values along the historic Owens River channel as mitigation for degradation done with water export activities. This policy shall apply to the portion of the Owens River identified as the Lower Owens River Project.

- **Goal BIO-2.** Provide a balanced approach to resource protection and recreational use of the natural environment.

- **Policy BIO-2.1 Coordination on Management of Adjacent Lands.** Work with other government land management agencies to preserve and protect biological resources while maintaining the ability to utilize and enjoy the natural resources in the County.

- **Policy BIO-2.2 Appropriate Access for Recreation.** Work with other government land management agencies to preserve and protect biological resources while maintaining the ability to utilize and enjoy natural resources in the County.

SECTION 4.0
RECOMMENDATIONS

This section covers recommendations for the proposed project / proposed action DCMs by stabilization of dunes via the incorporation of straw bales and natural vegetation enhancement. The BLM has recommendations in place to ensure sufficient habitat and microclimate conditions for the locally rare Owens dune weevil (*Trigonoscuta owensii*). These guidelines should be considered along with BLM consultation regarding the spacing, planting, and selection of appropriate plant populations and related activities on the proposed project / proposed action site. Also, although no state or federally listed species or sensitive habitats will be impacted by the DCMs, an informal consultation may be considered with the CDFW and USFWS regarding plans to enrich the Keeler Dunes environment, as the listed western snowy plover and sensitive aquatic habitats do exist adjacent to the proposed project / proposed action site on the Owen Lake.

Successful dune stabilization will be achieved if proper species selection, proper planting strategies, adequate watering, and adequate monitoring during the crucial first few months after planting are adhered to. Other important components to success while reducing negative impacts to the site are: to select pest-free and weed-free straw bales and plants; to react quickly to problems, such as inadequate watering, herbivore damage, or disease; and to avoid drawing the attention of vandals to the site, by not using pin flags or other obvious signs.

4.1 DETAILED ELEMENTS

4.1.1 Planting

Based on recommendations by Sapphos Environmental, Inc. and BLM resource specialists, plant selection was based on local thriving populations in dune environs with consideration of the BLM goal of producing habitat suitable for the locally rare Owens dune weevil. Plant species considered for incorporation were spiny saltbush (*Atriplex confertifolia*), Parry's saltbush (*Atriplex parryi*), allscale (*Atriplex polycarpa*), burrobush (*Franseria dumosa*), greasewood (*Sarcobatus vermiculatus*), and bush seepweed (*Suaeda nigra*). Varying plant populations of at least five species of local origin was ideal, while including both "r" selected species (early successional fast growing and high seed output) and "k" selected species (late successional slower growing and lower seed output) to induce conditions for long-term successional plant communities to evolve while taking advantage of any potentials vigorous candidates that happen to thrive on the dunes. Planting techniques included building meta-populations together with different species to allow for easier watering and for successful species to become established at more locations. Also, plants respond to gradients of resource quality within an area and will do better in one spot as opposed to another nearby location, so proper local site selection will increase success. Densities recommended by BLM and found in the Bishop Resource Management Plan are around 7 percent vegetative cover. Mature shrubs may provide approximately 7 to 10 percent vegetative cover.

Based on recommendations by BLM, if any special status plants are found prior to or during proposed project / proposed action activities, the proposed design would be modified to avoid impact.

4.1.2 Irrigation

The average rainfall for the Owens Lake is approximately 2.75 inches per year, with the rainy season occurring from October through March (Table 4.1.2-1, *Owens Lake North, Keeler: Rainfall and Temperatures*). Temperatures vary enough from season to season that it is advisable to plant during the beginning of the rainy season in October. Although numerous options are available for irrigation, many would require high maintenance and have an impact on the proposed project / proposed action site, such as a sprinkler system. A semi-low-tech method such as deep watering during planting and saturation of straw bales should be considered. Low-cost options (such as 2-liter bottles upside down in the ground) or 1-foot vertical pipes in the ground near each cluster of plants are labor-intensive and leave non-biodegradable components that would have to be picked up, could be conspicuous, and might draw unwanted attention.

TABLE 4.1.2-1
OWENS LAKE NORTH, KEELER: RAINFALL AND TEMPERATURES

	2012		2011		2010		2009	
Month	Avg. Temps*	Rain Total**	Avg. Temps*	Rain Total**	Avg. Temps*	Rain Total**	Avg. Temps*	Rain Total**
Jan	53/28	0.38	51/30	0.08	48/30	0.91	54/32	0.02
Feb	55/-144	0	54/33	0.23	55/36	0.56	53/33	1.24
Mar	63/-28	0.07	63/40	1.48	62/39	0.09	63/38	0
Apr	72/12	0.03	69/45	0	65/8	0.06	69/43	0
May	47/-80	0	74/50	0.03	74/49	0.01	85/59	0
Jun	90/60	0	85/60	0	89/63	0.01	82/59	0.19
Jul	93/65	0.56	93/30	0.38	97/69	0	98/68	0.07
Aug	96/69	0.06	96/-244	0.37	93/62	0	93/63	0
Sep	90/59	0	89/-222	0.02	90/54	1.11	89/59	0
Oct	76/49	0.1	76/-254	0.02	72/50	0.38	71/45	0.05
Nov	72/44	0	56/-413	0.05	59/36	0.05	62/36	0.3
Dec	n/a	n/a	48/-303	0.01	51/32	1.51	47/-5	0.55
Totals	n/a	1.2	n/a	2.67	n/a	4.69	n/a	2.42

NOTES: *Degrees Fahrenheit. **Inches.
SOURCE: University of California Cooperative Extension. 2012. Lake County. Agriculture and Natural Resources. Available at: http://celake.ucdavis.edu/about/weather_202/?weather=station&station=183

The proposed project / proposed action and alternatives 1, 2, 3, and 4 assume that the water for plant irrigation will be supplied from the District's 12-inch production well, located at the Fault Test Site, located about 0.7 mile northwest of the proposed project / proposed action boundary. The Fault Test well is an artesian (flowing) well and is capable of producing 250 gallons per minute (gpm) on a sustained basis.[1] An initial application of water at each straw bale installed in the dust control areas is expected to require approximately 985,480 gallons, which would be applied over a 2- to 4-month period (this includes the pre-planting watering as well as the watering at the time of planting). The Fault Test production well can produce a sustained flow rate of 250 gpm and thus

[1] Holder, G., Great Basin Unified Air Pollution Control District, Bishop, CA. 9 October 2012. Telephone conversation with D. Grotzinger, Sapphos Environmental, Inc., Pasadena, CA.

only requires a total flow of 2.7 days to produce enough water for the initial watering. Flow tests conducted at the Fault Test Site have included continuous flows for periods up to 90 days with no observed impacts to the surrounding area. Thus production of the relatively small amount of water needed for the plants on the proposed project / proposed action would not be expected to cause impacts to the local area. Action alternative 5 identifies another available water source; purchased water from the Keeler Community Services District (KCSD) Well located within the southeastern portion of the proposed project / proposed action study area.

Water will be transported to the proposed project / proposed action via water truck to the staging areas. Subsequent distribution to individual plants in the proposed project / proposed action would be conducted through hoses from smaller water tanks transported to the dust control areas via the access route or alternative temporary irrigation distribution system.

The alternative temporary irrigation distribution system may originate from several points depending on the alternative and include the three staging areas tanks, truck turnouts along Highway 136 or a direct connection from the Keeler Community Services District Well. PVC pipes will be constructed in a manifold at each of the delivery points to facilitate distribution throughout the irrigation system. The basis for the alternative temporary irrigation distribution system will consist of a network of rigid, 2-6 inch PVC lateral pipes stretched for a distance of up to 1,320 feet (1/4 mile), spaced about 150 feet apart. Along these pipes will be hose attachments spaced about 100 feet apart. To irrigate the plants, the booster pump will be activated, pressurizing the manifold. Workers on all-terrain vehicles (ATVs) with hoses on a reel will move along the lateral pipes, attaching the hose and irrigating the plants within reach of that hose attachment (a maximum of 75-100 feet away). The hose will then be detached, reeled up, and moved to the next attachment site. The pipe laterals with the hose attachments can be assembled using ATVs and trailers; there will be no need for any traffic other than ATVs along the lateral lines; only foot impacts will take place with the deployment of the hoses.

4.1.3 Monitoring

Once the project elements are in place, the site would be monitored regularly for a period of 3 years to evaluate the vegetation growth progress, assess plant mortality and herbivory, assess the need for additional watering, check the physical condition of straw bales, and replant as necessary. Review of DCM effectiveness will be completed at least one time per year and will be reported with recommendations, as appropriate, for adding supplemental plants and/or straw bales as needed to achieve the NAAQS for PM_{10}.

Monitoring for plant survivorship will occur more frequently in the first year of the proposed project / proposed action and less frequently as the plants establish themselves in subsequent years.

SECTION 5.0
RESULTS AND DISCUSSION

This section of the BRTR characterizes the environmental baseline conditions for biological resources within the proposed project / proposed action site, located in Inyo County, California. The potential for the proposed project / proposed action to result in impacts to sensitive biological resources due to dust control measures will likely be low. The results address the scope of analysis recommended in Appendix G of the CEQA Guidelines, the NEPA, the Bishop Resource Management Plan (RMP),[1] and the Inyo County General Plan and zoning ordinances related to biological resources, including but not limited to, special-status species and designated critical habitat; native resident or migratory species of fish and wildlife; and the consideration of federal, state, and regional conservation plans.

Review of previously prepared environmental documents along with a California Natural Diversity Database (CNDDB) search resulted in a total of 64 special-status species for consideration within the region of the proposed project / proposed action site (Appendix A, *Potential Sensitive Species*). Further analysis of species-specific range and, in particular, required habitats, produced a total of 29 special-status species for detailed attention. These special-status species include 1 listed plant species and 8 listed wildlife species, 10 sensitive wildlife species, and 4 locally important plant species and 6 locally important wildlife species that have the potential to occur within the region of the proposed project / proposed action site based on habitat requirements and known historic range.

Field surveys were undertaken by a Sapphos Environmental, Inc. botanist (Dr. Elizabeth Kempton), supported by Sapphos Environmental, Inc. biologists (Mr. Ryan Villanueva and Mr. John Ivanov). Sapphos Environmental, Inc. personnel (Dr. Elizabeth Kempton and Mr. Ryan Villanueva) conducted wildlife and plant surveys at the proposed project / proposed action site on April 12 and 13, 2011. In addition, Dr. Sharon Martinson and Mr. Brian J. Bielfelt conducted surveys for *Tescalsia giulianiata*, a winter moth, between January 7 and January 13, 2012. A follow-up visit was performed on June 6, 2012 by a Sapphos Environmental, Inc. biologist (Mr. John Ivanov) and July 23, 2013 (Ms. Lauren Dorough and Mr. Ryan Villanueva). Entomological surveys were conducted by Dr. Sharon Martinson (contract entomologist) on May 3 and 4, 2011. Sapphos Environmental, Inc. compiled a list of sensitive plants and wildlife with the potential to occur in the proposed project / proposed action area, including wildlife observed during the field surveys (Appendix A).

5.1 WETLANDS

The determination regarding the findings of absence of federally protected wetlands within the impact areas was assessed via ground-truthing and using the topographic map provided by the National Wetlands Inventory (NWI) to direct and focus attention. The southeast corner of the proposed project / proposed action site is indicated as wetlands by the most current NWI map, which is from the 1980s (Figure 2-1). According to the NWI, this wetland area is classified as a freshwater emergent wetland. Subsequent wetlands mapping conducted by Jones and Stokes Associates, Inc. in this area in 1995 identified a wetland located at the regulatory 3,600 feet above

[1] U.S. Department of the Interior, Bureau of Land Management. April 1993. *Bishop Resource Management Plan, Record of Decision*. . Bishop, CA.

mean sea level shoreline.[2] The District has indicated that this area was a former wetland that has been covered by sand migration.[3] The proposed project / proposed action DCMs would not be located below the 3,600-foot regulatory shoreline. Based on site surveys, no apparent wetland features were identified where the NWI or Jones and Stokes records exists.

Although both species of commonly occurring plants on site, Parry's saltbush (*Atriplex parryi*) and greasewood (*Sarcobatus vermiculatus*) can occur as a hydrophyte, they are facultative species that can either occur as uplands species or wetlands species.[4] The site does not appear to exhibit wetlands hydrology, as much of the site is sandy and will not hold water. No direct indication of wetlands was noted during site surveys within the proposed project / proposed action site based on the lack of all three key criteria being present at any given point on site: hydrophytic vegetation, hydric soils, and wetland hydrology.

5.2 PLANT COMMUNITIES

The results of field mapping were incorporated into the plant community map using GIS, approximating the total area of each plant population in acres, as well as the relative distribution or percentage of the total proposed project / proposed action site. All plants were compiled taxonomically into a compendium (Appendix C, *Floral and Faunal Compendium*).

The proposed project / proposed action site contains two plant communities, Shadscale Scrub and Creosote Bush–White Burr Sage Scrub. Shadscale Scrub is dominated by three distinct communities: Parry's saltbush, greasewood, and Parry's saltbush and greasewood. Much of the proposed project / proposed action site is open dry barren areas with little or no vegetation present (Figure 5.2-1, *Plant Community Map*). In most areas, plant densities on the proposed project / proposed action site vary from about 3 percent cover to approximately 6 percent cover with small isolated clumped areas of vegetation consisting of higher concentrations of the above mentioned species.[5] The plant community mapping evaluated all areas of the proposed project / proposed action site. There are no riparian plant communities present within the proposed project / proposed action site. The Shadscale Scrub and Creosote Bush–White Burr Sage Scrub plant communities that are present within the proposed project / proposed action site are not state-designated sensitive plant communities. The acreage of plant communities on the proposed project / proposed action site is summarized in Table 5.2-1, *Plant Communities Present within the Proposed Project / Proposed Action Site*.

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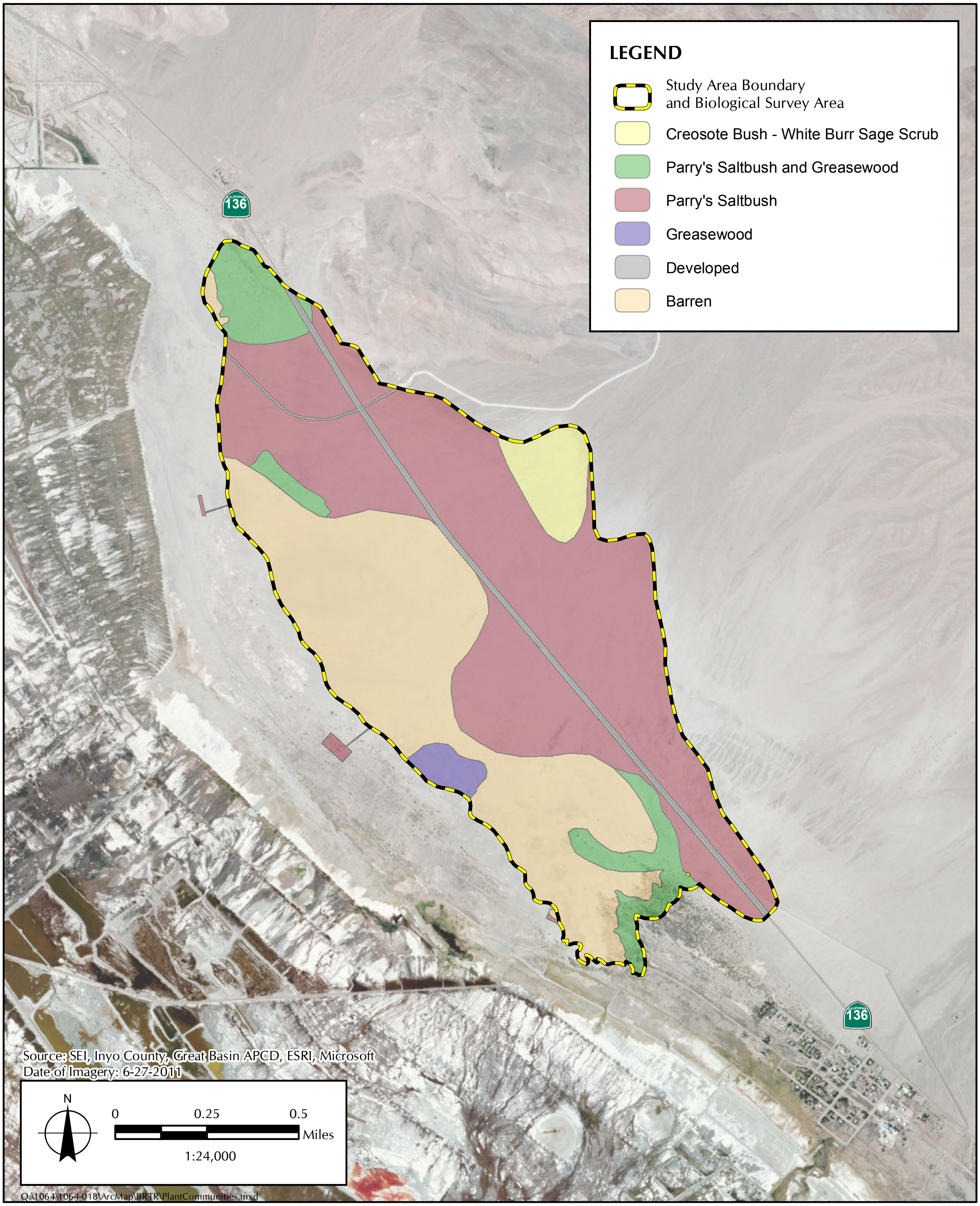
[2] Jones & Stokes Associates, Inc. 1996. *Delineation of Waters of the United States for the Owens Lake Playa* (JSA 95-330). Prepared for: U.S. Army Corps of Engineers, Los Angeles District, Ventura, CA. Prepared by: Jones & Stokes Associates, Inc., Sacramento, CA, and Great Basin Unified Air Pollution Control District, Bishop, CA.

[3] Holder, G., Great Basin Unified Air Pollution Control District, Bishop, CA. 28 September 2011. Email to D. Grotzinger, Sapphos Environmental, Inc., Pasadena, CA.

[4] U.S. Department of Agriculture Natural Resources Conservation Service. 2012. *National Wetland Plant List*. Available at: http://plants.usda.gov/wetland.html

[5] Great Basin Unified Air Pollution Control District. 2011. *Vegetation Cover Analysis*. Available at: http://gbuapcd.org/keelerdunes/presentations/VegetationCoverAnalysis.pdf



ALPINE MONO INYO

U.S. DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT

FIGURE 5.2-1

Plant Community Map

TABLE 5.2-1
PLANT COMMUNITIES PRESENT WITHIN THE PROPOSED PROJECT / PROPOSED ACTION SITE

Plant Community	Type	Element Code/Type	Current Status	Acres (Percentage)
Shadscale Scrub	Parry's Saltbush	California Natural Diversity Database Code 36.320.000	G4, S4	428 (49%)
	Parry's Saltbush and Greasewood	California Natural Diversity Database Code 36.320.000	G4, S4	12 (1%)
	Greasewood	California Natural Diversity Database Code 36.320.000	G4, S4	71 (8%)
Creosote Bush – White Burr Sage Scrub	N/A	California Natural Diversity Database Code 33.140.00	G5, S5	33 (4%)
Barren	N/A	N/A	N/A	306 (35%)
Developed	N/A	N/A	N/A	24 (3%)
			Total	874 (100%)

NOTE:
The *global rank* (G-rank) is a reflection of the overall condition of an element throughout its global range.

G1 = Less than 6 viable element occurrences (EOs) OR less than 1,000 individuals OR less than 2,000 acres.
G2 = 6–20 EOs OR 1,000–3,000 individuals OR 2,000–10,000 acres.
G3 = 21–100 EOs OR 3,000–10,000 individuals OR 10,000–50,000 acres.
G4 = Apparently secure; this rank is clearly lower than G3 but factors exist to cause some concern, i.e., there is some threat, or somewhat narrow habitat.
G5 = Population or stand demonstrably secure to ineradicable due to being commonly found in the world.

The *state rank* is assigned much the same way as the global rank, except state ranks in California often also contain a threat designation attached to the S-rank.

S1 = Less than 6 EOs OR less than 1,000 individuals OR less than 2,000 acres
S1.1 = very threatened
S1.2 = threatened
S1.3 = no current threats known
S2 = 6–20 EOs OR 1,000–3,000 individuals OR 2,000–10,000 acres
S2.1 = very threatened
S2.2 = threatened
S2.3 = no current threats known
S3 = 21–100 EOs or 3,000–10,000 individuals OR 10,000–50,000 acres
S3.1 = very threatened
S3.2 = threatened
S3.3 = no current threats known
S4 = Apparently secure within California; this rank is clearly lower than S3 but factors exist to cause some concern, i.e., there is some threat, or somewhat narrow habitat. NO THREAT RANK.
S5 = Demonstrably secure to ineradicable in California. NO THREAT RANK.

SOURCES:
California Department of Fish and Game. 2005. *Rarefind3: California Natural Diversity Database*. Sacramento, CA.
Holland, Robert F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California*. Sacramento, CA: California Department of Fish and Game.

5.2.1 Shadscale Scrub

Parry's saltbush (*Atriplex parryi*) is the dominant species within the survey area. This Shadscale community type includes a few other species, such as greasewood (*Sarcobatus vermiculatus*) and bush seepweed (*Suaeda nigra*). This community corresponds to Sawyer and Keeler-Wolf's

Shadscale series (CNDDB Code 36.320.00) and Holland's Shadscale scrub (Element Code: 36140). Shadscale scrub occurs on approximately 511 acres. Shadscale scrub dominated by Parry's saltbush accounts for approximately 428 acres and is located in a wide swath spanning the length of the study area. Shadscale scrub dominated by greasewood accounts for approximately 71.3 acres, and one patch of the plant community is located near the middle of the study area along the southern boundary. Shadscale scrub co-dominated by Parry's saltbush and greasewood accounts for approximately 12 acres of the study area and is located in the northwest corner and southeast corner of the study area with an additional patch near the northwest corner.

5.2.2 Creosote Bush–White Burr Sage Scrub

Creosote bush (*Larrea tridentata*) and white burr sage (*Ambrosia dumosa*) were the dominant species within this plant community. This Creosote Bush–White Burr Sage Scrub community type includes a few other species, such as desert holly (*Atriplex hymenelytra*) and cheesebush (*Ambrosia salsola*). This community corresponds to Sawyer and Keeler-Wolf's Creosote Bush–White Burr Sage Scrub series (CNDDB Code 33.140.00] and Holland's Mojave Creosote Bush Scrub (Element Code: 34100). Creosote Bush–White Burr Sage Scrub occurs on approximately 33.1 acres of the study area and is located near the middle of the study area along the northern boundary.

5.2.3 Barren

Barren aeolian sand deposits occur on approximately 306 acres and is located along the length of the southern boundary of the study area. Very few vascular plants grow in these areas.

5.2.4 Developed

Developed areas include existing dirt and paved roads within the study area. Developed areas generally lack vegetation and cover approximately 24 acres of the study area.

5.3 SPECIAL-STATUS SPECIES: LISTED, SENSITIVE, AND LOCALLY IMPORTANT SPECIES

The purpose of the literature review and field surveys of special-status species, within and adjacent to the proposed project / proposed action site, was to assess the potential for the proposed project / proposed action to have an adverse effect, either directly or through habitat modifications, on any species or their respective habitats, identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations by the CDFW, USFWS, or BLM. All listed species identified were further analyzed with sensitive and locally important species being analyzed only if it was observed on or adjacent to the proposed project / proposed action or potentially suitable habitat was present for the species on the proposed project / proposed action site. See Appendix A, *Potential Sensitive Species*, for a list of all special status species identified for the proposed project / proposed action.

5.3.1 Listed Species

There is very limited potential for the nine listed and one candidate species considered (Owens valley checkerbloom [*Sidalcea covillei*], Owens tui chub [*Gila bicolor snyderi*], Owens pupfish [*Cyprinodon radiosus*], desert tortoise [*Gopherus agassizii*], Swainson's hawk [*Buteo swainsoni*], western snowy plover [*Charadrius nivosus nivosus*], western yellow-billed cuckoo [*Coccyzus americanus occidentalis*], least Bell's vireo [*Vireo bellii pusillus*], Townsend's big-eared bat

(*Corynorhinus townsendii*) and Mohave ground squirrel [*Spermophilus mohavensis*]) to utilize the site to any extent due to a lack of suitable habitat. Thus, there were no federal or state-designated plants or animals identified as being present within the proposed project / proposed action site as a result of surveys. The proposed enhancements to the site only would increase the rare likelihood of such utilization and would not be detrimental to any known sensitive population. As a result of the habitat assessment, no significant potentially suitable habitat was identified for any listed species except for a small amount of marginally suitable habitat for Mohave ground squirrel. Following is a summary of the potential occurrence of state or federally listed species after consideration of the habitat and location of the proposed project / proposed action.

Plants

Owens Valley Checkerbloom

The Owens Valley checkerbloom was determined to be absent from the proposed project / proposed action area as a result of directed surveys conducted during the blooming period. The Owens Valley checkerbloom is a perennial herb listed by the State of California as endangered and a BLM sensitive species. This species is a perennial herb with pale pinkish-lavender flowers that blooms during May and June. The Owens Valley checkerbloom occurs throughout the Owens Valley in alkaline meadows. It is found in moist alkaline meadows and seeps between 3,500–4,700 feet above mean sea level (msl). Based on the review of the CNDDB, it was determined that the three closest occurrences are 1.4 miles west of the intersection of U.S. Route 395 and SR 136, 2.4 miles west southwest of the intersection of U.S. Route 395 and SR 136, and 2.4 miles southwest of the intersection of U.S. Route 395 and SR 136. As a result of the habitat assessment and field surveys, habitat suitable to support Owens Valley checkerbloom was not identified nor was the species found within the proposed project / proposed action site.

Animals

Owens Tui Chub and Owens Pupfish

Owens tui chub and Owens pupfish were determined to be absent as a result of presence/absence surveys. There is no suitable habitat within the proposed project / proposed action area for Owens tui chub or Owens pupfish. Owens tui chub and Owens pupfish are both state and federally endangered species. These two fishes occur in aquatic habitats in the Owens Basin. Owens tui chub and Owens pupfish were not observed as a result of plant community mapping, habitat assessment, and presence/absence surveys and were determined not likely to occur at the proposed project / proposed action site due to the absence of habitat suitable to support this species. The proposed project / proposed action site lacks aquatic habitats such as rivers or pools supporting fish populations.

Although Owens pupfish and Owen tui chub are not present in the area, the U.S. Fish and Wildlife Service has identified them in the Owens Basin Wetland and Aquatic Species Recovery Plan, which includes portions of the western margin of Owens Lake between the Owens River Delta and Olancha (Figure 5.3.1-1, *Southern Owens Conservation Area*).

Desert Tortoise

This species was determined to be absent as a result of presence/absence surveys. There is no suitable habitat within the proposed project / proposed action area. Desert tortoise is a state and federally threatened species. Desert tortoise is typically found on flats and alluvial fans with scattered shrubs and herbaceous plants growing in between. Soils range from sand to sandy gravel. Desert tortoise was not observed as a result of plant community mapping, habitat assessment, and presence/absence surveys and was determined not likely to occur at the proposed project / proposed action site due to the absence of habitat suitable to support this species. The proposed project / proposed action site lacks friable soils in open desert scrub, desert wash, and Joshua tree woodland habitats.

Swainson's Hawk

Swainson's hawk was determined to be absent as a result of presence/absence surveys. There is no suitable habitat within the proposed project / proposed action area. Swainson's hawk is a BLM sensitive and state-threatened species. Swainson's hawk breeds in areas with few trees adjacent to grasslands with adequate rodent populations. Swainson's hawk was not observed as a result of plant community mapping, habitat assessment, and presence/absence surveys and was determined not likely to occur at the proposed project / proposed action site due to the absence of habitat suitable to support this species. The proposed project / proposed action site lacks nest sites as well as a large prey population that would allow for regular foraging during any season.

Western Snowy Plover

Western snowy plover is a state species of special concern. A distinct population segment does occur along the Pacific Coast and is federally threatened. However, the proposed project / proposed action study area does not fall within the distinct population segment for the species. Based on the review of the CNDDB, it was determined that the three closest occurrences include two records within Owens Lake and one record 7.5 miles northwest of Keeler. The presence of western snowy plover at Owens Lake is well documented. Western snowy plover breeds on barren to sparsely vegetated ground at alkaline or saline lakes, reservoirs, and ponds.[6] At the Owens Lake, snowy plovers nest in relatively flat areas of barren playa with sandy and gravelly substrate and other gravel-covered surfaces, including berms and roadways. The proposed project / proposed action site lacks nest sites as well as suitable foraging habitat needed for plovers.

Western Yellow-Billed Cuckoo and Least Bell's Vireo

Western yellow-billed cuckoo and least Bell's vireo were determined to be absent as a result of presence/absence surveys. The western yellow-billed cuckoo is federally proposed as a threatened species and a state-endangered species. The least Bell's vireo is listed by both the state and federal governments as endangered. Western yellow-billed cuckoo and least Bell's vireo require riparian woodland habitats for all or portions of their life cycle. Western yellow-billed cuckoo and least Bell's vireo were not observed as a result of plant community mapping, habitat assessment, and presence/absence surveys and were determined not likely to occur at the proposed project / proposed action site due to the absence of habitat suitable to support this species. The proposed project / proposed action site lacks riparian woodland habitat suitable to support these two species.

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[6] Page, G.W., J.S. Warriner, J.C. Warriner, and P.W.C. Paton. 1995. "Snowy Plover (Charadrius alexandrinus)." In *The Birds of North America*, No. 154, eds. A. Poole and F. Gill. Philadelphia, PA: Academy of Natural Sciences and Washington, DC: American Ornithologists' Union.

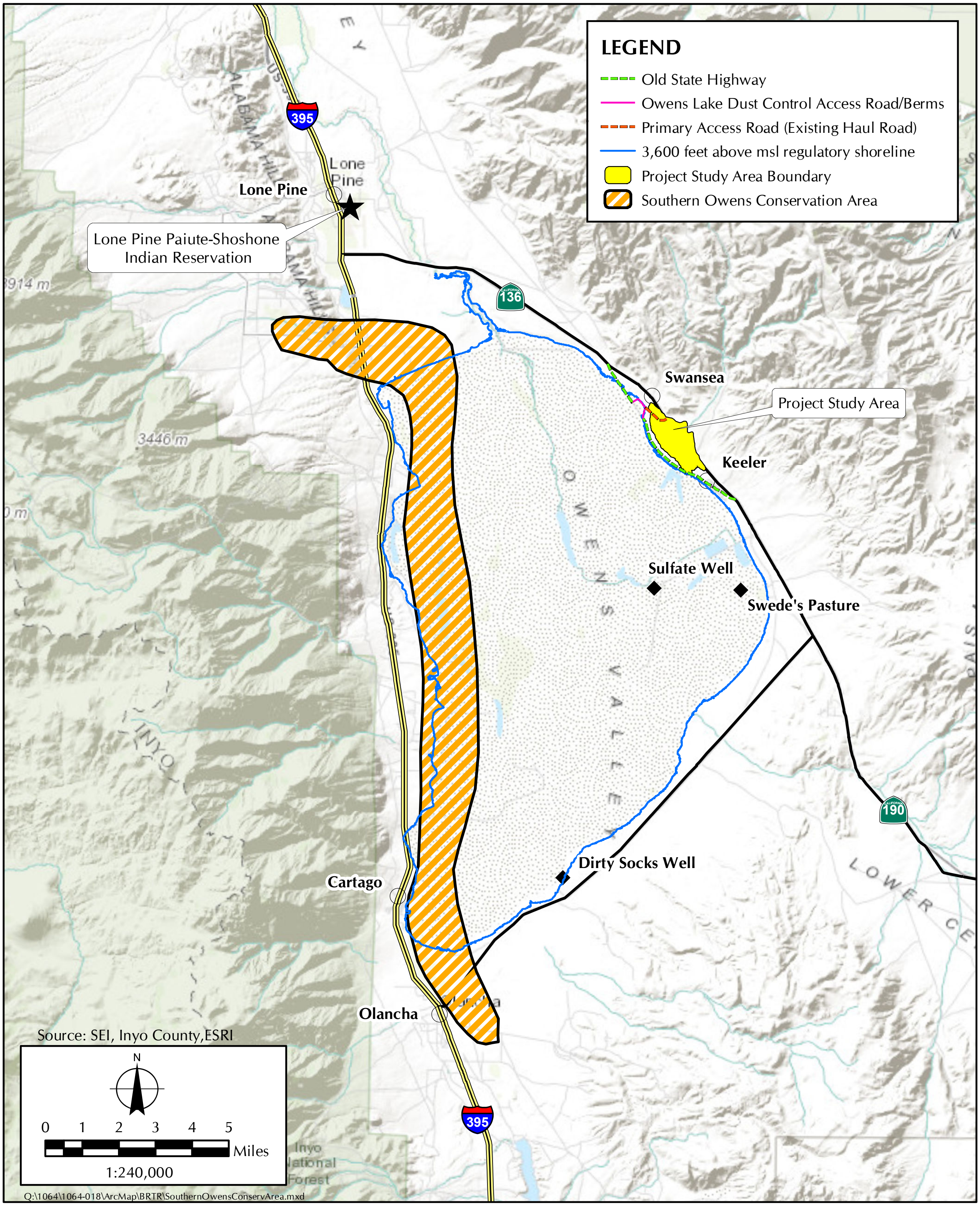

FIGURE 5.3.1-1

Southern Owens Conservation Area

Townsend's Big-Eared Bat

There is no roosting habitat within the proposed project / proposed action area for Townsend's big-eared bat. Bats utilize the Owens Lake bed and dunes for foraging only. However, this BLM sensitive and state candidate species has the potential to occur within the proposed project / proposed action site based on habitat requirements needed for foraging. Based on the review of the CNDDB, it was determined that the three closest occurrences of Townsend's big-eared bat include 16 miles east of Lone Pine, 2.2 miles north northwest of Keeler, and 11 miles southeast of Lone Pine.

Mohave Ground Squirrel

Mohave ground squirrel was determined to be absent as a result of presence/absence surveys. The Mohave ground squirrel is a BLM sensitive and state-threatened species. Habitat suitable to support Mohave ground squirrel consists of desert scrub, alkali scrub, and Joshua tree woodland habitats. The Mohave ground squirrel was not observed as a result of plant community mapping, habitat assessment, and presence/absence surveys and was determined not likely to occur at the proposed project / proposed action site due to the presence of a small amount of marginally suitable habitat to support this species. However, the marginally suitable habitat for the species is located north of Highway 136 and all proposed project / proposed action site activities are planned for areas south of Highway 136.

5.3.2 Sensitive Species

Sensitive species include all species not federally or state listed, but exclude the locally important species referenced in the section below and all other non-sensitive species. This includes all species listed as sensitive species by the BLM and/or California species of special concern by CDFW. Having identified suitable potential habitat with the study area, Sapphos Environmental, Inc. identified 16 sensitive species: Creamy blazing star (*Mentzelia tridentata*), Inyo County star-tulip (*Calochortus excavatus*), Sagebrush loeflingia (*Loeflingia squarrosa* var. *artemisiarum*), Sanicle cymopterus (*Cymopterus ripleyi* var. *saniculoides*), golden eagle (*Aquila chrysaetos*), American peregrine falcon (*Falco peregrinus anatum*), California horned lark (*Eremophila alpestris actia*), Le Conte's thrasher (*Toxostoma lecontei*), Loggerhead shrike (*Lanius ludovicianus*), Merlin (*Falco columbarius*), northern harrier (*Circus cyaneus*), prairie falcon (*Falco mexicanus*), American badger (*Taxidea taxus*), Owens Valley vole (*Microtus californicus vallicola*) and Southern grasshopper mouse (*Onychomys torridus ramona*). Certain species are excluded if suitable habitat for the species is not present on site (see Appendix A). An example of this would be Cooper's hawk, whose area of sensitivity is during the breeding season; due to a lack of suitable breeding habitat, even though limited suitable foraging habitat is available on site, this species has been excluded.

Although numerous sensitive species could potentially utilize the site in a very limited fashion, only the most likely were included. Taxa, such as Aves, are very mobile and could end up almost anywhere, at the very least, utilizing the air space above. Many such transient populations could utilize the Owens Lake adjacent to the proposed project / proposed action site. As a result of the habitat assessment, no significant potentially suitable habitat was identified for any sensitive species. Following is a summary of the considered inclusion for potential occurrence of sensitive species after consideration of the habitat and location of the proposed project / proposed action site.

Plants

Creamy Blazing Star

Creamy blazing star was determined to be absent within the proposed project / proposed action area as a result of directed surveys of the plant community, which provides potentially suitable habitat for this species, undertaken during the flowering period. Inyo County star-tulip is designated as a list 1B.3 plant (rare, threatened, or endangered in California and elsewhere) by CNPS. Creamy blazing star has been determined to be absent from the proposed project / proposed action area as a result of literature review, agency coordination, consultation with experts, and detailed field surveys. Based on the review of the CNDDB, the closest occurrence of this species is located 27 miles south of the proposed project / proposed action boundary.

Inyo County Star-Tulip

Inyo County star-tulip was determined to be absent within the proposed project / proposed action area as a result of directed surveys of the plant community, which provides potentially suitable habitat for this species, undertaken during the flowering period. Inyo County star-tulip is designated as a list 1B plant (rare, threatened, or endangered in California and elsewhere) by CNPS. Inyo County star-tulip has been determined to be absent from the proposed project / proposed action area as a result of literature review, agency coordination, consultation with experts, and detailed field surveys. Based on the review of the CNDDB, it was determined that the three closest occurrences are 2.5 miles southwest, 2.4 miles west-southwest, and 2.9 miles west of the U.S. Route 395 / SR 136 intersection.

Sagebrush Loeflingia

Sagebrush loeflingia was determined to be absent within the proposed project / proposed action area as a result of directed surveys of the plant community, which provides potentially suitable habitat for this species, undertaken during the flowering period. Sagebrush loeflingia is designated as a list 2.2 plant (rare, threatened, or endangered in California but more common elsewhere) by CNPS. Sagebrush loeflingia has been determined to be absent from the proposed project / proposed action area as a result of literature review, agency coordination, consultation with experts, and detailed field surveys. Based on the review of the CNDDB, it was determined that the closest occurrence is 35 miles northwest of the proposed project / proposed action.

Sanicle cympoterus

As a result of literature review, agency coordination, consultation with experts, and directed surveys undertaken during the flowering period, sanicle cymopterus was determined to be absent within the proposed project / proposed action study area. Sanicle cymopterus is designated as a CNPS List 1B.2 plant (rare, threatened, or endangered in California and elsewhere) and BLM sensitive species. Based on the review of the CNDDB, the closest occurrence of this species is located 17 miles south of the proposed project / proposed action boundary. As a result of the habitat assessment and field surveys, habitat suitable to support sanicle cymopterus was identified, but individuals were not found within the proposed project / proposed action.

Sanicle cymopterus was determined to be absent within the proposed project / proposed action area as a result of directed surveys of the plant community, which provides potentially suitable habitat for this species, undertaken during the flowering period. Sanicle cymopterus is designated as a list 1B.2 plant (rare, threatened, or endangered in California and elsewhere) by CNPS. Sanicle cymopterus has been determined to be absent from the proposed project / proposed action area as a result of literature review, agency coordination, consultation with experts, and detailed field surveys. . Based on the review of the CNDDB, the closest occurrence of this species is located 17 miles south of the proposed project / proposed action boundary.

Animals

American Peregrine Falcon

As a result of the habitat assessment and plant community mapping, low-grade suitable foraging habitat for American peregrine falcon was found throughout the proposed project / proposed action site, primarily in the western areas closer to marsh habitats and shallow flooding areas of the Owens Lake bed. American peregrine falcon is a California species of special concern. CNDDB records for this species are suppressed. No observations of American peregrine falcon were made during Sapphos Environmental, Inc. conducted surveys in the proposed project / proposed action area. The American peregrine falcon was previously listed as endangered under the state Endangered Species Act (ESA). The entire proposed project / proposed action area was determined to be of very limited use for foraging by the American peregrine falcon.

California Horned Lark

California horned lark has been determined to be present in the proposed project / proposed action area as a result of detailed field surveys and literature review. Observations of the Le Conte's thrasher were made during Sapphos Environmental, Inc. conducted surveys in the proposed project / proposed action area. Suitable habitat for the species is present on the proposed project / proposed action site.

Golden Eagle

As a result of the habitat assessment and plant community mapping, low-grade suitable foraging habitat for golden eagle was found throughout the proposed project / proposed action site. Golden eagle is a California fully protected species and BLM sensitive species. Listing as a fully protected species means that pursuant to state law, golden eagles may not be taken at any time and no state-issued licenses or permits may be issued for their take. Based on the review of the CNDDB, it was determined that the closest occurrence is 15.9 miles south. No observations of golden eagle were made during Sapphos Environmental, Inc. conducted surveys in the proposed project / proposed action area. The entire proposed project / proposed action area was determined to be of very limited use for foraging by the golden eagle.

Le Conte's Thrasher

Le Conte's thrasher has been determined to be present in the proposed project / proposed action area as a result of detailed field surveys and literature review. Observations of the Le Conte's thrasher and their nests were made during Sapphos Environmental, Inc. conducted surveys in the proposed project / proposed action area. Suitable habitat for the species is present on the proposed project / proposed action site.

Loggerhead Shrike

Loggerhead Shrike has been determined to be present in the proposed project / proposed action area as a result of detailed field surveys and literature review. Observations of the loggerhead shrike were made during Sapphos Environmental, Inc. conducted surveys within the proposed project / proposed action area. Suitable habitat for the species is present on the proposed project / proposed action site.

Merlin

As a result of the habitat assessment and plant community mapping, low-grade suitable foraging habitat for merlin was found throughout the proposed project / proposed action site. Merlin is a California species of special concern. CNDDB records for this species are suppressed. No observations of merlin were made during Sapphos Environmental, Inc. conducted surveys in the proposed project / proposed action area. The entire proposed project / proposed action area was determined to be of very limited use for foraging by the golden eagle.

Northern Harrier

As a result of the habitat assessment and plant community mapping, low-grade suitable foraging habitat for northern harrier was found throughout the proposed project / proposed action site. There was no suitable breeding habitat for northern harrier breeding identified within the proposed project / proposed action site as a result of directed surveys. The proposed project / proposed action site lacks riparian habitats and open grasslands. Northern harriers, a California species of special concern, were observed foraging on the western portion of the proposed project / proposed action area. Northern harriers usually return to the same area to nest. They nest on the ground in well-concealed locations, often near low shrubs or in tall clumps of vegetation. Nesting locations are usually in abandoned fields, wet meadows, and coastal and inland marshes. CNDDB records for this species are suppressed.

Prairie Falcon

Prairie falcons, a California species of special concern, have been frequently seen foraging west of the proposed project / proposed action site over Owens Lake and may utilize the site for hunting. CNDDB records for this species are suppressed. One observation of prairie falcon was made during Sapphos Environmental, Inc. conducted surveys in the proposed project / proposed action area. Prairie falcon is a desert and grassland species that nests in cliffs and preys mainly on birds and small mammals.

Pallid Bat and Spotted Bat

There is no roosting habitat within the proposed project / proposed action area for pallid bat or spotted bat. Bats utilize the Owens Lake bed and dunes for foraging only. However, these special-status bat species (all are California species of concern and BLM sensitive species) have the potential to occur within the proposed project / proposed action site based on habitat requirements needed for foraging. Based on the review of the CNDDB, it was determined that the three closest occurrences of pallid bat include three records from Owens Lake. Based on the review of the CNDDB, it was determined that the closest occurrences of spotted bat include six records from Owens Lake. No observations of pallid bat or spotted bat were made during Sapphos Environmental, Inc. conducted surveys in the proposed project / proposed action area.

American Badger

American Badger is a California species of special concern. As a result of directed field investigations, the American badger was determined to be present in the proposed project / proposed action area. Although no dens or evidence of on-site breeding was recorded, American badger is known to occasionally frequent the proposed project / proposed action site, most likely for foraging. The American badger is a wide-ranging species that occurs throughout most of the western United States, except for humid coastal plains. Reduction in numbers is primarily attributed to the conversion of grassland habitats to farmland.

Owens Valley Vole

Owens Valley vole, a BLM sensitive species and state species of special concern, is found in friable soils of wetlands and lush grassy ground in the Owens Valley. Based on the review of the CNDDB, it was determined that the closest occurrences include four records located approximately 500 feet east of U.S. Route 395 in Olancha. No observations of Owens Valley vole were made during Sapphos Environmental, Inc. conducted surveys in the proposed project / proposed action area. Marginally suitable habitat occurs in the Owens Lake bed, but not on the proposed project / proposed action site. Owens Valley vole has been found during focused surveys in other parts of Owens Lake.

Southern Grasshopper Mouse

Southern grasshopper mouse is a California species of special concern that is found in prairies and deserts in grass, sagebrush, and greasewood with sandy or gravelly soil. Based on the review of the CNDDB, there are no occurrences located within Inyo County. No observations of southern grasshopper mouse were made during Sapphos Environmental, Inc. conducted surveys in the proposed project / proposed action area. Suitable habitat occurs within the boundary of the proposed project / proposed action study area. Southern grasshopper mouse has been found during focused surveys in other parts of the Owens Lake bed.

5.3.3 Locally Important Species

As a result of the habitat assessment potentially suitable within the species concern area, Sapphos Environmental, Inc. identified four locally important plant species and six locally important wildlife species that were then the subject of detailed surveys: Booth's evening primrose (*Camissonia boothii* ssp. *boothii*), Lincoln rock cress (*Boechera lincolnensis*), Naked milk-vetch (*Astragalus serenoi* var. *shockleyi*), Nevada oryctes (*Oryctes nevadensis*), Alkali flats tiger beetle (*Cicindela willistoni pseudosenilis*), alkali skipper (*Pseudocopaeodes eunus*), *Tescalsia giulianiata* (no common name), Owens dune weevil (*Trigonoscuta owensii*), Owens Valley tiger beetle (*Cicindela tranquebarica inyo),* short-legged tiger beetle (*Cicindela tenuicincta*), and Bell's sparrow (*Amphispiza belli canensis*). Locally important species are defined as a plant or animal that lacks a formal listing, from either federal or state agencies, but is considered to be regionally unique, limited, or imperiled. Certain species are excluded if it was not observed during surveys or suitable habitat for the species is not present on site (see Appendix A).

Plants

Booth's Evening Primrose

Booth's evening primrose was determined to be absent within the proposed project / proposed action area as a result of directed surveys of the plant community that provides potentially suitable habitat for this species, undertaken during the flowering period. Booth's evening primrose is designated as a list 2.3 plant (rare, threatened, or endangered in California, but more common elsewhere) by CNPS. Booth's evening primrose has been determined to be absent from the proposed project / proposed action area as a result of literature review, agency coordination, consultation with experts, and detailed field surveys. Based on the review of the CNDDB, it was determined that the closest occurrences are located in the Lone Pine quadrangle, a minimum of 10.8 miles west of the proposed project / proposed action.

Lincoln's Rock Cress

Lincoln's rock cress was determined to be absent within the proposed project / proposed action area as a result of directed surveys of the plant community that provides potentially suitable habitat for this species, undertaken during the flowering period. Lincoln's rock cress is designated as a list 2.3 plant (rare, threatened, or endangered in California, but more common elsewhere) by CNPS. Lincoln's rock cress has been determined to be absent from the proposed project / proposed action area as a result of literature review, agency coordination, consultation with experts, and detailed field surveys. Based on the review of the CNDDB, it was determined that the closest occurrence is located 9.4 miles northeast of the proposed project / proposed action.

Naked Milk-Vetch

As a result of directed surveys, naked milk-vetch was determined to be absent within the proposed project / proposed action study area. Naked milk-vetch is designated as a CNPS List 2.2 plant (rare, threatened or endangered in California but more common elsewhere). naked milk-vetch has been determined to be absent in the proposed project / proposed action study area as a result of literature review, agency coordination, consultation with experts, and detailed field surveys. Based on the review of the CNDDB, the closest occurrence of this species is located 3.1 miles north of the proposed project / proposed action boundary. As a result of the habitat assessment and field surveys, habitat suitable to support naked milk-vetch was identified, but individuals were not found within the proposed project / proposed action.

Nevada Oryctes

Nevada oryctes was determined to be absent within the proposed project / proposed action area as a result of directed surveys of the plant community that provides potentially suitable habitat for this species, undertaken during the flowering period. Nevada oryctes is designated as a list 2.1 plant (rare, threatened, or endangered in California, but more common elsewhere) by CNPS. Nevada oryctes has been determined to be absent from the proposed project / proposed action area as a result of literature review, agency coordination, consultation with experts, and detailed field surveys. Based on the review of the CNDDB, it was determined that the closest occurrences are located in the Lone Pine quadrangle, a minimum of 5 miles west of the proposed project / proposed action.

Animals

Alkali Flats Tiger Beetle

Literature review, agency coordination, consultation with experts, and detailed field surveys determined alkali flats tiger beetle to be potentially present in the proposed project / proposed action study area. Although no alkali flats tiger beetles were observed during field surveys, a review of insect collections revealed that at least three individuals have been collected in the vicinity. Several specimens of alkali flat tiger beetle have been collected from the Owens Lake area in 1937 and 1946 and from Keeler in 1953, but it is not possible to identify exactly where these specimens were collected.

Alkali Skipper

Alkali skipper has been determined to be absent from the proposed project / proposed action area as a result of literature review, agency coordination, consultation with experts, and detailed field surveys. Insect collections reveal that this species has been observed around Lone Pine, but there are no other records documenting this species closer to Keeler Dunes. Alkali skipper was not observed during detailed field surveys but the plant community may be potential habitat for this species.

Tescalsia giulianiata

T. giulianiata has been determined to be potentially present at the proposed project / proposed action area as a result of literature review, agency coordination, consultation with experts, and detailed field surveys. This species is very cryptic and has not been well described. For example, the larval food plant for *T. giulianiata* is unknown. *T. giulianiata* has only been recorded from a few locations, with most of the insects collected around dunes at Deep Spring, within the Alabama Hills, and around Owens Lake, including a specimen collected 9 miles northwest of Keeler in the entomology collection at the Essig Museum. Reportedly, the leading expert on *T. giulianiata*, the late Derham Giuliani, said the ecosystems around Keeler Dunes appeared to be suitable for *T. giulianiata*. It is best to assume that this species is potentially present at the proposed project / proposed action area because of the accounts from Mr. Giuliani, the absence of detailed habitat-related information for this species, its limited flight period each year, and known records around Owens Lake.

Owens Dune Weevil

Owens dune weevil has been determined to be present in the proposed project / proposed action area as a result of detailed field surveys. Owens dune weevil was observed seven times during May 2011 and once during May 2012 surveys. These individuals were observed in sandy, barren areas (two individuals); in Parry's saltbush (three individuals); and in Parry's saltbush/greasewood (one individual) vegetation type areas. Prior to May 2011, two additional incidental observations of the species were made in sandy, barren areas along the dunes.

Owens Valley Tiger Beetle

Owens Valley tiger beetle has been determined to be potentially present on the proposed project / proposed action area as a result of literature review, agency coordination, consultation with experts, and detailed field surveys. This species has been detected and collected within the Owens

Valley, including an individual observed around Owens Lake within several miles of the proposed project / proposed action boundary.[7] The presence of this species around Owens Lake increased the probability that this species may be present within the study area, even though it was not detected during surveys.

Short-Legged Tiger Beetle

Short-legged tiger beetle has been determined to be absent from the proposed project / proposed action area as a result of literature review, agency coordination, consultation with experts, and detailed field surveys. Previous documents in support of Owen's Lake projects have called this species the "slender-girdled tiger beetle"; however, a majority of scientific literature refers to this genus and species as the "short-legged tiger beetle." Reviewed insect collections have not documented short-legged tiger beetle in the vicinity of the study area. Therefore, evidence suggests that this species is absent from the proposed project / proposed action area.

Bell's Sparrow

Bell's sparrow has been determined to be present in the proposed project / proposed action area as a result of detailed field surveys. Observations of Bell's sparrow on the proposed project / proposed action study area have been made. Suitable foraging habitat for the species is present on the proposed project / proposed action site.

5.4 NATIVE RESIDENT OR MIGRATORY SPECIES

5.4.1 Mammals

Having identified suitable potential habitat within the study area, Sapphos Environmental, Inc. identified 12 native resident or migratory wildlife species that were the subject of analysis: deer mouse (*Peromyscus maniculatus*), Merriam's kangaroo rat (*Dipodomys merriamii*), little pocket mouse (*Perognathus longimembris*), western harvest mouse (*Reithrodontomys megalotis*), chisel-toothed kangaroo rat (*Dipodomys microps*), Panamint kangaroo rat (*D. panamintinus*), tule elk (*Cervus elaphus nannodes*), Ringtail (*Bassariscus astutus*), Desert kit fox (*Vulpes macrotis arsipus*), Yuma myotis *(Myotis yumanensis),* California myotis *(Myotis californicus),* and Mexican free-tailed bat *(Tadarida brasiliensis).*

Small Mammals

Sapphos Environmental, Inc. conducted small mammal trapping at three locations on the Owens Lake bed in 2007, adjacent to the proposed project / proposed action location, including a proposed shallow flooding site, previously established revegetation site, and a wet meadow site. The proposed shallow flooding site had the lowest capture rate of 2 percent, with only deer mice captures. Deer mice captured at the proposed shallow flooding site were observed. Post-release, deer mice returned to areas previously revegetated. Small mammal trapping efforts in the established revegetated grid resulted in the capture of two species, deer mouse (*Peromyscus maniculatus*) and Merriam's kangaroo rat (*Dipodomys merriamii*), with a capture rate of 7.3 percent. The Bartlett Springs wet meadow site and associated margin had moderate capture rates of 4.6 percent with the highest diversity of small mammals captured with five species represented:

[7] Sapphos Environmental, Inc. 2008. *Owens Valley PM_{10} Planning Area Final Biological Resources Technical Report*. Pasadena, CA.

little pocket mouse (*Perognathus longimembris*), western harvest mouse (*Reithrodontomys megalotis*), Merriam's kangaroo rat, chisel-toothed kangaroo rat (*Dipodomys microps*), and Panamint kangaroo rat (*D. panamintinus*). Although these species were documented adjacent to the proposed project / proposed action site, there is foraging potential for all six species in and around the proposed project / proposed action site.

Tule Elk

Tule elk has been determined to be absent in the proposed project / proposed action study area as a result of detailed field surveys and literature review. The proposed project / proposed action site is located in close proximity to a calving area for tule elk (*Cervus elaphus nannodes*). In addition, the Owens River delta is a calving area for the Owens Valley population of tule elk. Tule elk occur in wooded, shrubby, grassland, and riparian habitats. One of nine Owens Valley tule elk calving areas exists on the north end of Owens Lake. The calving period for tule elk occurs from May to June. This is the period tule elk would be expected to found on the lake bed, but not within the Keeler Dunes. The proposed project / proposed action site does not have suitable habitat for Owens Valley tule elk; any occurrences would be of a transient nature. The Owens Valley tule elk herd is managed at a population size of 300 individuals through hunting.

Ringtail

Ringtail has been determined to be present in the proposed project / proposed action study area as a result of detailed field surveys and literature review. Although no observations of the ringtail were made during Sapphos Environmental, Inc. conducted surveys, observations of ringtail sign indicate the species frequently utilizes the proposed project / proposed action area, particularly in the past year. The proposed project / proposed action site does not have suitable habitat for ringtail. Occurrences would be of a transient nature with individuals passing through the proposed project / proposed action area in search of a patch of suitable habitat.

Desert Kit Fox

Desert kit fox has been determined to be present in the proposed project / proposed action area as a result of detailed field surveys and literature review. Although no observations of the desert kit fox were made during Sapphos Environmental, Inc. surveys, observations of adults and pups utilizing the proposed project / proposed action area have been made. Dens, including breeding dens, have been observed in and around the proposed project / proposed action site.

Migratory Bat Species

As a result of the biological surveys and literature review, Sapphos Environmental, Inc. identified three common migratory bat species that are present in the proposed project / proposed action site: Yuma myotis, California myotis, and Mexican free-tailed bat. Sapphos Environmental, Inc. took into consideration habitat preferences and known range of each species to make a determination as to which species could potentially be present. There is no roosting habitat within the proposed project / proposed action area for Yuma myotis, California myotis, and Mexican free-tailed bat. Bats utilize the Owens Lake bed and dunes for foraging only. However, these bat species have the potential to occur within the proposed project / proposed action site based on habitat for foraging.

Terrestrial Corridors

The proposed project / proposed action site contains sparse, monotypic Shadscale scrub habitat and lacks known or documented terrestrial mammal corridors. Terrestrial mammal movement through the site will not be hindered by the proposed project / proposed action. Revegetation will take place on approximately 194 acres and cover is anticipated to be patchy, ranging from 15 percent to 27.5 percent cover, leaving terrestrial mammals the capability to easily travel through the proposed project / proposed action property.

5.4.2 Birds

The proposed project / proposed action area does not support breeding areas for the western snowy plover and other shorebirds protected under the Migratory Bird Treaty Act. The Owens Valley is part of the Pacific Flyway for migrating shorebirds, waterfowl, and other species. The National Audubon Society and Bird Life International have designated Owens Lake as a Nationally Important Bird Area, but would not include the Keeler Dunes due to a lack of suitable foraging and breeding habitat for most birds.

Of the 39 avian species recorded at the proposed project / proposed action property as a result of biological surveys in 2011 and 2012, after excluding listed and sensitive species, it was determined that 6 common species of interest, all raptors, were observed:

- Turkey vulture (*Cathartes aura*)
- Cooper's hawk (*Accipiter cooperii*)
- Red-tailed hawk (*Buteo jamaicensis*)
- American kestrel (*Falco sparverius*)
- Barn owl (*Tyto alba*)
- Great horned owl (*Bubo virginianus*)

Turkey Vulture

Turkey vultures are abundant in many areas of North America and slightly less common throughout California, including Owens Valley.[8] Turkey vultures do not usually breed in desert habitats away from foothills and mountains. They may breed locally but are more common as migrants.[9,10,11] Turkey vulture was observed flying over the proposed project / proposed action site during biological surveys.

[8] Garrett, K., and J. Dunn. 1981. *Birds of Southern California: Status and Distribution*. Los Angeles, CA: Los Angeles Audubon Society, p. 408.

[9] Garrett, K., and J. Dunn. 1981. *Birds of Southern California: Status and Distribution*. Los Angeles, CA: Los Angeles Audubon Society, p. 408.

[10] Heindel, M.T. 2000. *Birds of Eastern Kern County*. Available at: http://fog.ccsf.cc.ca.us/~jmorlan/

[11] Rowe, S. P., and T. Gallion. 1996. "Fall Migration of Turkey Vultures and Raptors through the Southern Sierra Nevada, California." *Western Birds*, *27*: 48–53.

Cooper's Hawk

Cooper's hawk populations have dramatically increased over the last 20 to 30 years in North American and the species has become fairly common to common in Southern California.[12,13,14] It breeds in many areas of the Owens Valley and eastern Inyo County,[15,16] but does not breed within the proposed project / proposed action property because suitable breeding habitat (riparian forest and other closed woodlands) is absent. Cooper's hawk was observed flying over the proposed project / proposed action site during biological surveys and utilized the site for foraging.

Red-tailed Hawk

Red-tailed hawk is common to abundant throughout North America and Southern California, including Inyo County.[17,18,19] but does not breed on the proposed project / proposed action property because suitable breeding habitat (large trees and cliffs) is absent. Red-tailed hawk was observed flying over the proposed project / proposed action site during biological surveys and utilized the site for foraging.

American Kestrel

The American kestrel is a common raptor species that will breed and winter in the Owens Valley and Inyo County.[20,21] It will nest in small and large trees, including Joshua tree cavities or other available cavity nest sites, but the proposed project / proposed action site lacks suitable breeding habitat. American kestrel was observed flying over the proposed project / proposed action site during biological surveys and utilized the site for foraging.

Barn Owl

The barn owl is fairly common in agricultural regions and grassland habitats that are intermixed with scattered ranch yards, groves of trees, and cliffs at lower elevations through much of Southern California.[22,23] Barn owls would be unlikely to nest on the proposed project / proposed action site

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[12] Garrett, K., and J. Dunn. 1981. *Birds of Southern California: Status and Distribution*. Los Angeles, CA: Los Angeles Audubon Society, p. 408.

[13] Sibley, D.A. 2000. *The Sibley Guide to Birds*. New York, NY: Knopf.

[14] Shuford, W.D., and T. Gardali, eds. 2008. "California Bird Species of Special Concern: A Ranked Assessment of Species, Subspecies, and Distinct Populations of Birds of Immediate Conservation Concern in California." In *Studies of Western Birds 1*. Camarillo, CA: Western Field Ornithologists; and Sacramento, CA: California Department of Fish and Game.

[15] Garrett, K., and J. Dunn. 1981. *Birds of Southern California: Status and Distribution*. Los Angeles, CA: Los Angeles Audubon Society, p. 408.

[16] Heindel, M.T. 2000. *Birds of Eastern Kern County*. Available at: http://fog.ccsf.cc.ca.us/~jmorlan/

[17] Garrett, K., and J. Dunn. 1981. *Birds of Southern California: Status and Distribution*. Los Angeles, CA: Los Angeles Audubon Society, p. 408.

[18] Sibley, D.A. 2000. *The Sibley Guide to Birds*. New York, NY: Knopf.

[19] Heindel, M.T. 2000. *Birds of Eastern Kern County*. Available at: http://fog.ccsf.cc.ca.us/~jmorlan/

[20] Garrett, K., and J. Dunn. 1981. *Birds of Southern California: Status and Distribution*. Los Angeles, CA: Los Angeles Audubon Society, p. 408.

[21] Heindel, M.T. 2000. *Birds of Eastern Kern County*. Available at: http://fog.ccsf.cc.ca.us/~jmorlan/

[22] Garrett, K., and J. Dunn. 1981. *Birds of Southern California: Status and Distribution*. Los Angeles, CA: Los Angeles Audubon Society, p. 408.

because of scarcity of suitable nest sites (mine shafts and caves). Barn owl was observed flying over the proposed project / proposed action site during biological surveys and utilized the site for foraging.

Great Horned Owl

The great horned owl is a common raptor species of interest in California. Great horned owls are numerous in appropriate habitat in many areas of Southern California and North America, including the Owens Valley and Inyo County.[24,25,26] Great horned owls would be unlikely to nest on the proposed project / proposed action site because of scarcity of suitable nest sites (large trees and snags). Great horned owl was observed flying over the proposed project / proposed action site during biological surveys and utilized the site for foraging.

5.4.3 Herpetofauna

As a result of the literature review and habitat assessment, three commonly occurring species of herpetofauna were found to be present within the proposed project / proposed action site, including desert spiny (*Sceloporus magister*), zebra-tailed lizard (*Callisaurus draconoides*), and common side-blotched lizard (*Uta stansburiana*). All three species were noted on site during surveys.

5.4.4 Fish

Standing water is absent within the proposed project / proposed action property. Consequently, no fish were identified within the proposed project / proposed action property.

5.5 IMPACT ANALYSIS

5.5.1 Mammals

The construction, operation, and maintenance of the proposed project / proposed action would not be expected to result in significant adverse impacts to, or adversely affect, the survival and recovery in the wild of common small mammal species that may be resident in the vicinity of the proposed project / proposed action area and that may forage within the proposed project / proposed action study area. Therefore, the consideration of mitigation measures for these species is not warranted.

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[23] Heindel, M.T. 2000. *Birds of Eastern Kern County*. Available at: http://fog.ccsf.cc.ca.us/~jmorlan/

[24] Garrett, K., and J. Dunn. 1981. *Birds of Southern California: Status and Distribution*. Los Angeles, CA: Los Angeles Audubon Society, p. 408.

[25] Sibley, D.A. 2000. *The Sibley Guide to Birds*. New York, NY: Knopf.

[26] Heindel, M.T. 2000. *Birds of Eastern Kern County*. Available at: http://fog.ccsf.cc.ca.us/~jmorlan/

5.5.2 Resident or Migratory Birds

Due to the lack of suitable breeding and migratory stopover habitat, the proposed project / proposed action would not result in significant adverse impacts to, or adversely affect, the survival of common birds identified within the proposed project / proposed action study area. Therefore, direct, indirect, or cumulative impacts would not be anticipated for common bird species and the consideration of mitigation measures for these species is not warranted.

5.5.3 Herpetofauna

Due to the low numbers of herpetofauna, the proposed project / proposed action would not result in significant adverse impacts to, or adversely affect, the survival of common herpetofauna identified within the proposed project / proposed action study area. Therefore, direct, indirect, or cumulative impacts are not anticipated for common herpetofauna and the consideration of mitigation measures for these species is not warranted.

5.5.4 Fish

No fish species were identified within the proposed project / proposed action study area; therefore, there would be no anticipated impacts to biological resources related to migratory fish. The consideration of mitigation measures for these species is not warranted.

5.5.5 Invertebrates

One locally important species, the Owens dune weevil, was observed on the proposed project / proposed action study area and has potential to be impacted as part of the proposed project / proposed action. The Owens dune weevil is not listed or proposed for listing under the federal or state endangered species acts and has no required mitigation for impacts to the species. However, the goal of the proposed project / proposed action is to enhance and stabilize the dunes for a reduction in dust emissions and may mitigate for impacts to the species due to the enhancement and stabilization of the species habitat, the Keeler Dunes.

The construction, operation, and maintenance of the proposed project / proposed action would not be expected to result in significant adverse impacts to, or adversely affect, the survival and recovery in the wild of other common invertebrate species that may be resident in the vicinity of the proposed project / proposed action area and that may forage within the proposed project / proposed action study area. Therefore, the consideration of mitigation measures for these species is not warranted.

The goal of the proposed project / proposed action is to stabilize the dunes and establish native vegetation that would increase vegetation coverage for 194 acres that have been degraded by migrating sand. In 1993, when the BLM Resource Management Plan (RMP) was written, the Owens dune weevil had approximately 4,285 acres of suitable dune habitat. Based on the amount of habitat listed in the RMP, the proposed project / proposed action contains approximately 4.5 percent of the overall Owens dune weevil habitat. The BLM's RMP notes that *Atriplex polycarpa* and *Sarcobatus vermiculatus* are important species for dune stabilization. *Atriplex polycarpa* is the primary native species chosen for the proposed project / proposed action, in addition to other species on the RMP list and, hence, does not conflict with the RMP guidance.

The BLM has recommendations in place to ensure sufficient habitat and microclimate conditions for the Owens dune weevil. These recommendations can be found in the RMP and contains two goals for the Owens dune weevil:

1. Maintain and enhance habitat for Owens dune weevil.

2. Meet desired plant community (DPC) goals on 3,214 acres (75 percent) of dune habitat to maintain habitat for the Owens dune weevil.

With regards to conserving Owens dune weevil habitat, the DPC goals found in the RMP specifies the "retention of present vegetative cover which varies from scant cover of widely scattered shrubs and herbs to nearly closed shrub canopies."[27] This helps maintain diversity of the overall dune habitat. The DPC goals also seek to "maintain the current overall vegetative cover of approximately 7 percent in the dune habitat."

The percentage of vegetative cover required for 85 percent and 95 percent dust control is 7 percent and 10 percent, respectively. The existing cover is estimated at 3 percent to 6 percent. Although the 194 acres of dust control will exceed 7 percent vegetative cover for this specific area, the percent cover for the overall dune habitat will not significantly change. The overall coverage for the proposed project / proposed action area located west of SR 136 would be approximately 10 percent with fully implemented dust controls. Existing barren and sparsely vegetated areas will remain for the Owens dune weevil in the surrounding areas to the north, east, and southeast, providing a mixture of cover as expressed in the RMP.[28] Based on best prevailing science, it is unclear whether the Owens dune weevil will survive in areas with greater than 7 percent vegetative cover. However, it is anticipated that the Owens dune weevil will continue to use the proposed project / proposed action area and surrounding areas.

During grading activities for the proposed staging areas and access roads, it is possible that individuals of this species may perish. However, the proposed project / proposed action would provide a long-term net benefit by providing a stable dune habitat environment and mixture of vegetative cover for a variety of wildlife species including the Owens dune weevil.

5.6 CONSISTENCY WITH FEDERAL, STATE, AND REGIONAL CONSERVATION PLANS

5.6.1 Existing Conditions

Habitat Conservation Plans and Natural Community Conservation Plans

One habitat conservation plan, the Desert Renewable Energy Conservation Plan (DRECP), has been proposed for the proposed project / proposed action area.[29] The proposed project / proposed action area is adjacent to the West Mojave Plan,[30] but outside of the DRECP boundaries.

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[27] U.S. Department of the Interior, Bureau of Land Management, Bakersfield District. April 1993. *Bishop Resource Management Plan Record of Decision:* Appendix 1, *Desired Plant Community Definitions*. Bakersfield, CA.

[28] U.S. Department of the Interior, Bureau of Land Management, Bakersfield District. April 1993. *Bishop Resource Management Plan Record of Decision:* Appendix 1, *Desired Plant Community Definitions*. Bakersfield, CA.

[29] California Energy Commission. October 2011. *Preliminary Conservation Strategy – Desert Renewable Energy Conservation Plan (DRECP)*. Sacramento, CA. Available at: http://www.drecp.org/documents/docs/preliminary_conservation_strategy/02_Cover_and_Table_of_Contents.pdf

[30] Bureau of Land Management. January 2005. *Final Environmental Impact Report and Statement for the West Mojave Plan*. Moreno Valley, CA. Available at: http://www.blm.gov/ca/pdfs/cdd_pdfs/wemo_pdfs/plan/wemo/Vol-1-

Basin Wetland and Aquatic Species Recovery Plan

The proposed project / proposed action is located within the Owens Basin Wetland and Aquatic Species Recovery Plan: Inyo and Mono Counties, California.[31]

Bishop Resource Management Plan

The proposed project / proposed action is located within the within the area administered under the Bishop RMP by the BLM Bishop Field Office..[32]

Lower Owens River Project

The Inyo County General Plan Policy Goal BIO-1.8 (Owens River Restoration), which is the applicable policy goal for management of Owens Lake, states that Inyo County will work with the City of Los Angeles and regulatory agencies to complete the restoration of habitat values along the historic Owens River channel as mitigation for degradation resulting from water export activities. This policy applies to the portion of the Owens River identified as the Lower Owens River Project. An associated policy, Inyo County Land Use Policy LU-1.16, states that all General Plan land use designations shall allow for the implementation of enhancement/mitigation projects and/or mitigation measures as described in Inyo County, the City of Los Angeles's Long Term Ground Water Management Agreement,[33] and/or the 1991 Final Environmental Impact Report that addressed that agreement.[34]

5.6.2 Impact Analysis

Habitat Conservation Plans and Natural Community Conservation Plans

The DRECP is still under development at the time of this report. However, under all currently proposed DRECP alternatives, BLM lands in the proposed project / proposed action area would be encompassed within a proposed Area of Critical Environmental Concern (ACEC) to protect cultural and biological resources including dune habitat. Renewable energy projects would not be allowed within the ACEC. Anticipated effects of the proposed project / proposed action would be consistent with ACEC management as currently proposed under the DRECP.

Chapter1_Bookmarks.pdf

[31] U.S. Fish and Wildlife Service. 2006. *Owens Basin Wetland and Aquatic Species Recovery Plan: Inyo and Mono Counties, California*.

[32] U.S. Department of the Interior, Bureau of Land Management. April 1993. *Bishop Resource Management Plan, Record of Decision*. Bishop, CA.

[33] Inyo County. 1991. *Superior Court of California, County of Inyo, Case No. 12908*. Agreement between Inyo County and the City of Los Angeles and its Department of Water and Power on a Long Term Groundwater Management Plan for Owens Valley and Inyo County. Available at: http://www.inyowater.org/Water_Resources/long_term_water_agreement.pdf

[34] City of Los Angeles Department of Water and Power. 1991. *Water from the Owens Valley to Supply the Second Los Angeles Aqueduct 1970 to 1990, 1990 Onward, Pursuant to a Long Term Groundwater Management Plan Environmental Impact Report*. SCH #89080705. Los Angeles, CA. Available at: http://www.inyowater.org/Water_Resources/1991eir/default.htm

Owens Basin Wetland and Aquatic Species Recovery Plan

The Owens Basin Wetland and Aquatic Species Recovery Plan for Inyo and Mono Counties describes 16 recommended conservation areas that are integral to the recovery plan. The nearest of the conservation areas, the Southern Owens Conservation Area, is located along the western perimeter of the Owens Lake. The proposed project / proposed action site is not within the Southern Owens Conservation Area, but the goals and objectives specified in the recovery plan will be considered when implementing DCMs (Figure 5.3.1-1).

BLM Bishop Resource Management Plan

The BLM Bishop RMP identifies several statements, guidelines, and goals regionally, as well as in the Owens Lake Management Area, which includes Owens Lake and surrounding areas including the proposed project / proposed action site south of Highway 136. In accordance with applicable management guidelines, the CDFW has been consulted and notified with regards to the proposed project / proposed action and known listed or sensitive species. Candidate, sensitive, and other species of management concern have been identified and the proposed project / proposed action has been designed to minimize and avoid these species where possible.

The proposed project / proposed action is consistent with direction in the Bishop RMP related to biological resources.

Inyo County General Plan: Owens River Restoration

The proposed project / proposed action area is located approximately 3 miles away from the Lower Owens River Project and would not be expected to conflict with that project or impede the implementation of that project.

5.6.3 Mitigation Measures

There are no major impacts to biological resources related to consistency with adopted federal, state, or regional conservation plans; therefore, mitigation measures are not required.

Bittner, D., and J. Oakley. 1998. "Golden Eagle (*Aquila chrysaetos*) Population of San Diego County, California." Presented at Raptor Research Foundation Annual Meeting, November 3–7, Ogden, UT.

Bureau of Land Management. 1993. *Bishop Resource Management Plan Record of Decision*. Bishop, CA.

Bureau of Land Management. January 2005. *Final Environmental Impact Report and Statement for the West Mojave Plan*. Moreno Valley, CA. Available at: http://www.blm.gov/ca/pdfs/cdd_pdfs/wemo_pdfs/plan/wemo/Vol-1-Chapter1_Bookmarks.pdf

Bureau of Land Management. April 2006. *Resource Management Plans for California's Public Lands*. Sacramento, CA.

Calflora. n.d. Calflora Database. Available at: http://www.calflora.org. This database is continually updated, so it is an appropriate source of names for new species not described in *The Jepson Manual*.

California Department of Fish and Game, Wildlife and Habitat Data Analysis Branch. September 2003. *List of California Terrestrial Natural Communities Recognized by the California Natural Diversity Database*. Sacramento, CA. Available at: http://www.dfg.ca.gov/whdab/html/natural_communities.html

California Department of Fish and Game. 2005. *Rarefind 3: A Database Application for the Use of the California Department of Fish and Game Natural Diversity Database*. Sacramento, CA.

California Department of Fish and Game. 2008. *Fully Protected Animals*. Sacramento, CA. Available at: http://www.dfg.ca.gov/wildlife/species/t_e_spp/fully_pro.html

California Energy Commission. October 2011. *Preliminary Conservation Strategy – Desert Renewable Energy Conservation Plan (DRECP)*. Sacramento, CA. Available at: http://www.drecp.org/documents/docs/preliminary_conservation_strategy/02_Cover_and_Table_of_Contents.pdf

California Fish and Game Commission Policies: Wetland Resources Policy; Wetland Definition, Mitigation Strategies, and Habitat Value Assessment Strategy; Amended 1994.

California Native Plant Society Vegetation Committee. September 2004. *California Native Plant Society Vegetation Rapid Assessment Protocol*. Sacramento, CA. Available at: http://www.cnps.org/cnps/vegetation/pdf/rapid_assessment_protocol.pdf

City of Los Angeles Department of Water and Power. 1991. *Water from the Owens Valley to Supply the Second Los Angeles Aqueduct 1970 to 1990, 1990 Onward, Pursuant to a Long Term Groundwater Management Plan Environmental Impact Report*. SCH #89080705. Los Angeles, CA. Available at: http://www.inyowater.org/Water_Resources/1991eir/default.htm

City of Los Angeles Department of Water and Power. 2001. *Rare Plant Survey Report Owens Dry Lake Dust Control Project Sites*. Los Angeles, CA.

Cowardin, Lewis M., et al. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Department of the Interior, Fish and Wildlife Service.

Garrett, K., and J. Dunn. 1981. *Birds of Southern California: Status and Distribution*. Los Angeles, CA: Los Angeles Audubon Society, p. 408.

Good, R.E., R.M. Nielson, H. Sawyer, and L.L. McDonald. 2007. "A Population Estimate for Golden Eagles in the Western United States." *Journal of Wildlife Management*, *71*: 395–402.

Great Basin Unified Air Pollution Control District. 2008. *2008 Owens Valley PM10 Planning Area Demonstration of Attainment State Implementation Plan*. Bishop, CA.

Great Basin Unified Air Pollution Control District. 2011. *Vegetation Cover Analysis*. Available at: http://gbuapcd.org/keelerdunes/presentations/VegetationCoverAnalysis.pdf

Heindel, M.T. 2000. *Birds of Eastern Kern County*. Available at: http://fog.ccsf.cc.ca.us/~jmorlan/

Hickman, J.C., ed. 1993. *The Jepson Manual: Higher Plants of California*. Berkeley, CA: University of California Press.

Holder, G., Great Basin Unified Air Pollution Control District, Bishop, CA. 28 September 2011. Email to D. Grotzinger, Sapphos Environmental, Inc., Pasadena, CA.

Holland, Robert F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California*. Sacramento, CA: California Department of Fish and Game.

Inyo County. 1991. *Superior Court of California, County of Inyo, Case No. 12908*. Agreement between Inyo County and the City of Los Angeles and its Department of Water and Power on a Long Term Groundwater Management Plan for Owens Valley and Inyo County. Available at: http://www.inyowater.org/Water_Resources/long_term_water_agreement.pdf

Inyo County Planning Department. December 2001. *Inyo County General Plan, Conservation and Open Space Element*. Independence, CA.

Jepson Flora Project. 2013. *Jepson eFlora*. Available at: http://ucjeps.berkeley.edu/IJM.html

Jones & Stokes Associates, Inc. 1996. *Delineation of Waters of the United States for the Owens Lake Playa* (JSA 95-330). Prepared for: U.S. Army Corps of Engineers, Los Angeles District, Ventura, CA. Prepared by: Jones & Stokes Associates, Inc., Sacramento, CA, and Great Basin Unified Air Pollution Control District, Bishop, CA.

Martinson, Sharon J. May 2012. *Summary of Services Provided & Results*.

McCaffery, B.J., and C. McIntyre. 2005. "Disparities between Results and Conclusions: Do Golden Eagles Warrant Special Concern Based on Migration Counts in the Western United States?" *Condor*, *107*: 469–473.

Munz, Philip A., and D.D. Keck. 1949. "California Plant Communities." *El Aliso*, *2*(1): 87–105.

Page, G.W., J.S. Warriner, J.C. Warriner, and P.W.C. Paton. 1995. "Snowy Plover (Charadrius alexandrinus)." In *The Birds of North America*, No. 154, eds. A. Poole and F. Gill. Philadelphia, PA: Academy of Natural Sciences and Washington, DC: American Ornithologists' Union.

Rowe, S. P., and T. Gallion. 1996. "Fall Migration of Turkey Vultures and Raptors through the Southern Sierra Nevada, California." *Western Birds*, *27*: 48–53.

Sapphos Environmental, Inc. 2008. *Owens Valley PM_{10} Planning Area Final Biological Resources Technical Report*. Pasadena, CA.

Sawyer, J.O., and T. Keeler-Wolf. 1995. *A Manual of California Vegetation*. Sacramento, CA: California Native Plant Society.

Schade, Theodore D., et al. *2008 Owens Valley PM10 Planning Area Demonstration of Attainment State Implementation Plan*. Bishop, CA: Great Basin Unified Air Pollution Control District.

Shuford, W.D., and T. Gardali, eds. 2008. "California Bird Species of Special Concern: A Ranked Assessment of Species, Subspecies, and Distinct Populations of Birds of Immediate Conservation Concern in California." In *Studies of Western Birds 1*. Camarillo, CA: Western Field Ornithologists; and Sacramento, CA: California Department of Fish and Game.

Sibley, D.A. 2000. *The Sibley Guide to Birds*. New York, NY: Knopf.

U.S. Army Corps of Engineers. n.d. "Recognizing Wetlands – An Informational Pamphlet." Available at: http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits/techbio.aspx

U.S. Department of Agriculture Natural Resources Conservation Service. 2012. *National Wetland Plant List*. Available at: http://plants.usda.gov/wetland.html

U.S. Department of the Interior, Bureau of Land Management, Bakersfield District. April 1993. *Bishop Resource Management Plan Record of Decision:* Appendix 1, *Desired Plant Community Definitions*. Bakersfield, CA.

U.S. Fish and Wildlife Service. 1998. *Owens Basin Wetland and Aquatic Species Recovery Plan: Inyo and Mono Counties*. Portland, OR.

U.S. Fish and Wildlife Service. 2006. *Owens Basin Wetland and Aquatic Species Recovery Plan: Inyo and Mono Counties, California*.

U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, U.S. Army Corps of Engineers, and U.S. Department of Agriculture Soil Conservation Service. 1989. *Federal Manual for Identifying and Delineating Jurisdictional Wetlands*. An Interagency Cooperative Publication. Washington, DC.

U.S. Geological Survey. 1982. *7.5-Minute Series, Haiwee Reservoirs, California Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1982. *7.5-Minute Series, Union Wash, California Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1987. *7.5-Minute Series, Bartlett, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1987. *7.5-Minute Series, Centennial Canyon, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1987. *7.5-Minute Series, Cerro Gordo Peak, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1987. *7.5-Minute Series, Dolomite, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1987. *7.5-Minute Series, Keeler, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1987. *7.5-Minute Series, Olancha, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1987. *7.5-Minute Series, Owens Lake, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1987. *7.5-Minute Series, Vermillion Canyon, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1994. *7.5-Minute Series, Lone Pine, California, Topographic Quadrangle*. Denver, CO.

University of California Cooperative Extension. 2012. Lake County. Agriculture and Natural Resources. Available at: http://celake.ucdavis.edu/about/weather_202/?weather=station&station=183

APPENDIX A
POTENTIAL SENSITIVE SPECIES

TABLE A-1
LISTED SPECIES WITH THE POTENTIAL TO OCCUR
IN THE REGION OF THE PROPOSED PROJECT / PROPOSED ACTION SITE

Species	Status	Habitat	Occurrence
Plants			
Owens Valley checkerbloom (*Sidalcea covillei*)	SE, BLM	Great basin scrub, limestone, meadow, seep, and wetlands. Associated with alkaline meadows in Owens Valley at elevation range of 3,500 to 4,650 feet above mean sea level (AMSL)	Not found during 1995–1996, 1999–2001, 2003, or 2007 surveys at the dry Owens Lake bed; not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area.
Wildlife			
Owens pupfish (*Cyprinodon radiosus*)	FE, SE	Found among shallow water habitats in the Owens Valley, preferring warm, clear water	Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area.
Owens tui chub (*Gila bicolor snyderi*)	FE, SE	Found among shallow water habitats in the Owens Valley, preferring warm, clear water	Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area.
Desert tortoise (*Gopherus agassizii*)	FT, ST	Requires friable soils for burrow construction in open desert scrub, desert wash, and Joshua tree woodland	Surveyed for in 1995–1996 and 2002–2003 at the dry Owens Lake bed, but not found; potential burrows found. Known south of Owens Valley; an adult was observed in July 1995 to the east of Owens Lake. Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area.
Swainson's hawk (*Buteo swainsoni)*	ST, BLM	Breeds in stands with few trees in juniper-sage flats, riparian areas, and oak savannah, with suitable grasslands nearby that contain adequate rodent populations; migrants may occur throughout the desert	Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area.
Western snowy plover (*Charadrius nivosus nivosus*)	FE (DPS), CSC	Prefers sandy beaches, salt pond levees, and shores of large alkali lakes	Observed nesting on Owens lake playa. Surveys conducted for the species since 1989; regular visitor and breeder at the dry Owens Lake. Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area.

TABLE A-1
LISTED SPECIES WITH THE POTENTIAL TO OCCUR
IN THE REGION OF THE PROPOSED PROJECT / PROPOSED ACTION SITE, *Continued*

Species	Status	Habitat	Occurrence
Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)	FP, SE	Prefers low riparian habitats in vicinity of water or dry river bottoms	Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area.
Least Bell's vireo (*Vireo bellii pusillus*)	FE, SE	Prefers low riparian habitats in vicinity of water or dry river bottoms below 2,000 feet AMSL	Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area.
Townsend's big-eared bat (*Corynorhinus townsendii*)	SC, BLM	Lives in a variety of habitats throughout the desert regions of California; forages over mesic and riparian corridors	Surveyed for in 1995–1996 at Owens lake, but not found; found east of State Highway 136 outside of project area. Not observed in proposed project / proposed action area. There is no suitable roosting habitat in the proposed project / proposed action area.
Mohave ground squirrel (*Spermophilus mohavensis*)	ST, BLM	Prefers sandy gravelly soils in open desert scrub, alkali scrub, and Joshua tree woodland	Not found during 1995–1996 and 2004 surveys at Owens Lake; record of occurrence from south of Keeler Dunes along State Highway 136 less than 1 mile from the proposed project study area. Not observed in proposed project / proposed action area. There is limited suitable habitat in the proposed project / proposed action area.

KEY:
BLM = Bureau of Land Management (BLM) Sensitive species
FE = Listed as endangered under the federal Endangered Species Act (ESA)
FP = Proposed for federal listing under the federal ESA
FT = Listed as threatened under the federal ESA
CSC = California Species of Special Concern
SC = Listed as a candidate under the State of California
SE = Listed as endangered by the State of California
ST = Listed as threatened under the State of California
DPS = Distinct population segment

TABLE A-2
SENSITIVE SPECIES WITH THE POTENTIAL TO OCCUR
IN THE REGION OF THE PROPOSED PROJECT / PROPOSED ACTION SITE

Species	Status	Habitat	Occurrence
Plant			
Creamy blazing star (*Mentzelia tridentata*)	BLM, CNPS 1B	Found in Mojavean desert scrub at elevation range of 2,297 to 3,806 feet AMSL; flowing period is March–May	Not observed in proposed project / proposed action area. There is suitable habitat in the proposed project / proposed action area.
Bald daisy (*Erigeron calvus*)	BLM, CNPS 1B	Found in Great Basin Scrub at an elevation range of 2,953-4,235 feet AMSL	Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area.
Inyo County star-tulip (*Calochortus excavatus*)	BLM, CNPS 1B	Found among alkaline meadows in shadscale scrub at elevation range of 3,773 to 6,562 feet AMSL	Surveyed for in 1995–1996, 1999, 2000, 2001, 2003–2004, 2007 on project sites. Not observed in proposed project / proposed action area. There is suitable habitat in the proposed project / proposed action area.
Inyo phacelia (*Phacelia inyoensis*)	BLM, CNPS 1B	Found in alkaline meadows and seeps of Inyo County at elevation range of 2,953 to 10,499 feet AMSL	Surveyed for and not found in 1999–2001, 2003–2004 focused surveys Owen Lake. Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area.
Inyo rock daisy (*Perityle inyoensis*)	BLM, CNPS 1B	Found in Pinyon and Juniper Woodland at an elevation range of 6,562 to 9,843 feet AMSL	Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area.
Parish's popcorn-flower (*Plagiobothrys parishii*)	BLM, CNPS 1B	Great Basin scrub	Found north of Cartago, Inyo County; threatened by groundwater pumping; flowering period is May–June (and uncommonly in November). Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area.
Sagebrush loeflingia (*Loeflingia squarrosa* var. *artemisiarum*)	BLM, CNPS 2	Associated with desert dunes, great basin scrub of Inyo County at elevation range of 2,297 to 5331 feet AMSL; blooms April to May	Surveyed for in 1999, 2001, 2003, and 2004 in Owens Lake, but not found. Nearest CNDDB location in Tinemaha Reservoir quadrangle, approximately 35 miles to the northwest of the proposed project site. Not observed in proposed project / proposed action area. There is suitable habitat in the proposed project / proposed action area.

TABLE A-2
SENSITIVE SPECIES WITH THE POTENTIAL TO OCCUR IN THE REGION OF THE PROPOSED PROJECT / PROPOSED ACTION SITE, *Continued*

Species	Status	Habitat	Occurrence
Sanicle cymopterus (*Cymopterus ripleyi* var. *saniculoides*)	BLM, CNPS 1B	Typically associated with Joshua tree woodland, Mojavean desert scrub of Inyo County at elevation range of 3,280 to 5,495 feet AMSL	Observed among scrub habitat near Dirty Socks well, Owens Lake basin. Not observed in proposed project / proposed action area. There is suitable habitat in the proposed project / proposed action area.
Wildlife			
Inyo Mountains slender salamander (*Batrachoseps campi*)	BLM, CSC	Riparian scrub, riparian woodland, talus slope, wetlands	Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area.
Northern sagebrush lizard (*Sceloporus graciosus*)	BLM	Occurs in many habitats, chiefly at higher montane elevations, where it prefers open ground with scattered low bushes	Not found during surveys on west side of Owens Lake in 2004. Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area.
Panamint alligator lizard (*Elgaria panamintina*)	BLM, CSC	Riparian scrub	Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area.
American peregrine falcon (*Falco peregrinus anatum*)	CSC	Scarce migrants may occur at sites in the desert where suitable avian prey is concentrated, such as shorebird populations at flooded areas on Owens Lake	One seen near Cartago Creek during 1995–1996 surveys; none observed during spring 2003 surveys over Owens Lake; one observed during surveys over Owens Lake 2007. Very limited potential for utilization at proposed project site due to low prey base and lack of suitable habitat. Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area.
Burrowing owl (*Athene cunicularia*)	CSC	Nests and resides in desert scrub and agricultural habitats	Found during autumn 1995 surveys west of Point Bartlett; found along Cottonwood Creek during 2002 surveys; not found during spring/summer 2003, 2004 surveys within the at Owens lake. The Great Basin Unified Air Pollution Control District has documented use of pipes for burrows within Owens lake Project Areas. Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area.

TABLE A-2
SENSITIVE SPECIES WITH THE POTENTIAL TO OCCUR
IN THE REGION OF THE PROPOSED PROJECT / PROPOSED ACTION SITE, *Continued*

Species	Status	Habitat	Occurrence
California horned lark (*Eremophila alpestris actia*)	CSC	Nests on open grassland areas with exposed surfaces	Observed in proposed project / proposed action area. There is suitable habitat in the proposed project / proposed action area.
Cooper's hawk (*Accipiter cooperii*) (nesting)	CSC	Nests in thick oak and willow riparian habitats	Found in Owens River delta in 1995–1996; found roosting along the Owens River delta during 2002–2003 surveys; not found during spring 2003 at Owens Lake. Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area. Very limited potential for utilization at proposed project site due to low prey base and lack of suitable habitat.
Ferruginous hawk (*Buteo regalis*) (wintering)	CSC	Nests on steep cliff faces or atop tall species of trees with snags	Found near Dirty Socks and Owens River delta during 1995–1996 and 2002 surveys; not found during spring 2003 surveys within proposed project area; determined absent as a result of presence/absence surveys in supplemental DCMs in 2007. Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area. Limited potential for utilization at proposed project site due to low prey base and lack of suitable habitat.
Golden eagle (*Aquila chrysaetos*)	CSC FPS	Nests on steep cliff faces or atop tall species of trees with snags	Found foraging in Owens River delta in 1995–1996; found frequently foraging along margins of Owens Lake; not found at two air quality monitoring sites during surveys on west side of Owens Lake on August 4, 2004; observed flying over west side of Owens Lake in 2011. Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area. Limited potential for utilization at proposed project site due to low prey base and no habitat for breeding, but low numbers of black-tailed jackrabbits (*Lepus californicus*) do occur on-site.

TABLE A-2
SENSITIVE SPECIES WITH THE POTENTIAL TO OCCUR
IN THE REGION OF THE PROPOSED PROJECT / PROPOSED ACTION SITE, *Continued*

Species	Status	Habitat	Occurrence
Le Conte's thrasher (*Toxostoma lecontei*)	CSC	Resides in desert habitats; primarily in open desert wash, desert scrub, alkali desert scrub, desert succulent scrub	Found in saltbush scrub habitats during 2002 surveys adjacent to the proposed project area, but not found during spring 2003. Found during 1995–1996 surveys in shadscale scrub north of Keeler Ponds, near Owens River, northeast of Dirty Socks and Cottonwood Creek. Observed breeding on the proposed project site. There is suitable habitat in the proposed project / proposed action area.
Loggerhead shrike (*Lanius ludovicianus*)	CSC	Nests and resides in desert scrub and savannah woodland habitats	Found at Keeler Ponds and Cottonwood Creek during 1995–1996 and 2002 surveys and found along the Owens River delta during 2002–2003 surveys; not found during spring 2003 surveys within Owens Lake; not found at two air quality monitoring sites during surveys on west side of Owens Lake on August 4, 2004; found during April 2006 surveys, when it was common at Managed Vegetation areas within the proposed project site. Observed foraging on the western portion of the proposed project site. There is limited suitable habitat in the proposed project / proposed action area.
Long-billed curlew (*Numenius americanus*)	CSC	Common to uncommon migrant through this region in California; forages in brine pools and shallow water habitats	Surveyed for in 1995–1996 and 2002–2003 at Owens lake, but not found; observed in evaporation ponds at Cartago Creek in January 1996 and Ash Creek Meadows in May 1996. Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area.
Merlin (*Falco columbarius*) (wintering)	CSC	Migrant and winter visitor found in areas in the desert where suitable avian prey is concentrated, such as shorebirds	Found wintering in the Owens River delta in January 1996; not found during spring 2003 surveys within over Owens Lake; determined absent as a result of presence/absence surveys at Owens Lake 2007. Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area.

TABLE A-2
SENSITIVE SPECIES WITH THE POTENTIAL TO OCCUR
IN THE REGION OF THE PROPOSED PROJECT / PROPOSED ACTION SITE, *Continued*

Species	Status	Habitat	Occurrence
Mountain plover (*Charadrius montanus*)	CSC	Agricultural fields and meadow areas	Four observed at meadow at Keeler Ponds (Horse Pasture) in 1995, north of project site; otherwise surveyed for in 1995–1996 and 2002–2003 at Owens lake. Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area.
Northern harrier (*Circus cyaneus*) (nesting)	CSC	Nests in riparian habitats and forages over open grasslands, marshes, and wetland areas	Found in marsh areas (nesting) during 1995–1996 and 2002 surveys at Owens River Delta, Keeler Ponds, and Swedes Pasture; not found during spring 2003 surveys around the proposed project area. Very limited potential for utilization at proposed project / proposed action area due to low prey base and lack of suitable habitat. Observed foraging over the western portion of the propose project site.
Prairie falcon (*Falco mexicanus*)	CSC	Regular visitor to Owens Valley; nests on cliff faces	Found at Cottonwood Spring, Cartago Creek, northeast of Dirty Socks, Swedes Pasture, and Owens River delta during 1995–1996 surveys; not found during 2002–2003 surveys within the proposed project area; observed foraging over Owens Lake in 2007, 2010, 2011, 2012. Limited potential for utilization at proposed project / proposed action area due to low prey base and lack of suitable habitat. Observed flying over the western portion of the proposed project site.
Sharp-shinned hawk (*Accipiter striatus*) (nesting)	CSC	Nests in thick oak and willow riparian habitats	Found south of State Highway 136 in winter 1995–1996; not found during 2002–2003 surveys over Owens Lake. Generally a mountain breeder. Not observed in proposed project / proposed action area. Very limited potential for utilization at proposed project / proposed action area due to low prey base and lack of suitable habitat.
Tricolored blackbird (*Agelaius tricolor*) (nesting)	CSC	Nests in emergent wetland vegetation, which includes bullrush and tules	Surveyed for in 1995–1996, 2002, and 2003 on Owen Lake, but not found; observed foraging over meadows in Owens River Delta, Horse Pasture, and Dirty Socks in 1995–1996. Not observed in proposed project /

TABLE A-2
SENSITIVE SPECIES WITH THE POTENTIAL TO OCCUR
IN THE REGION OF THE PROPOSED PROJECT / PROPOSED ACTION SITE, *Continued*

Species	Status	Habitat	Occurrence
			proposed action area. There is no suitable habitat in the proposed project / proposed action area.
Vaux's swift (*Chaetura vauxi*)	CSC	Common migrant	Surveyed for in 1995–1996, 2002, 2003 at Owens Lake, but not found. Present as a vernal and autumnal migrant in Owens Valley. Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area.
Virginia's warbler (*Vermivora luciae*) (nesting)	CSC	Migrant along riparian margins	Limited potential for migrant utilization at proposed project site. Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area.
Yellow warbler (*Dendroica petechia brewsteri*) (nesting)	CSC	Nests in willow riparian habitats; occurs as a migrant	Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area.
Yellow-breasted chat (*Icteria virens*) (nesting)	CSC	Resides in low, dense riparian habitat consisting of willow, blackberry, wild grape; uncommon regular migrant in the area	Surveyed for in 1995–1996 and 2002–2003 at Dust Control Project sites, but not found; not found at two air quality monitoring sites during surveys on west side of Owens Lake on August 4, 2004; found south of Cabin Bar Ranch in July 1995, but not found during 1996. Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area.
Pallid bat (*Antrozous pallidus*)	CSC, BLM	Resides in deserts, grasslands, shrublands; most common in open, dry habitats with rock areas	Not found during 1995–1996 sites over Owens Lake; not found at two air quality monitoring sites during surveys on west side of Owens Lake on August 4, 2004; found foraging over meadows at Owens River delta, Keeler Ponds, and Dirty Socks in 1995–1996; determined absent as a result of presence/absence surveys in supplemental surveys at Owens Lake in 2007. Not observed in proposed project / proposed action area. There is no suitable roosting habitat in the proposed project / proposed action area.

TABLE A-2
SENSITIVE SPECIES WITH THE POTENTIAL TO OCCUR IN THE REGION OF THE PROPOSED PROJECT / PROPOSED ACTION SITE, *Continued*

Species	Status	Habitat	Occurrence
Spotted bat (*Euderma maculatum*)	CSC, BLM	Lives in a variety of habitats throughout California	Found foraging over Owens Lake during 1995–1996 and 2003 surveys; determined absent as a result of presence/absence surveys in supplemental DCMs in 2007. Not observed in proposed project / proposed action area. There is no roosting suitable habitat in the proposed project / proposed action area.
Western small-footed myotis (*Myotis ciliolabrum*)	BLM	Found throughout the desert; solitary species	Found foraging over aquatic habitats in 1995–1996, found foraging over Owens Lake in 2003; not found at two air quality monitoring sites during surveys on west side of Owens Lake on August 4, 2004. Not observed in proposed project / proposed action area. There is no suitable roosting habitat in the proposed project / proposed action area.
Long-eared myotis (*Myotis evotis*)	BLM	Found in coniferous forests; migrates through riparian habitat in Owens River Valley	Found in 1996 at cattle tank north of North Seep and west of Keeler; found in autumn 1995 and spring 1996 in Owens Lake area. Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area..
Long-legged (hairy-winged) myotis (*Myotis volans*)	BLM	Found in the desert up to 8,202 feet above mean sea level in forested regions and brushy areas; roosts in buildings, trees, and crevices	Found foraging over aquatic habitats in 1995–1996 Owens lake; possibly detected by acoustic signature in 2003 at Owens Lake. Not observed in proposed project / proposed action area. There is no suitable roosting habitat in the proposed project / proposed action area.
Yuma myotis (*Myotis yumanensis*)	BLM	Found in the desert, especially along wooded canyon bottoms; common in southeastern California; colonial species, roosting in caves and old buildings	Found foraging over aquatic habitats in 1995–1996; found over Owens Lake in 2003. Not observed in proposed project / proposed action area. There is no suitable roosting habitat in the proposed project / proposed action area.

TABLE A-2
SENSITIVE SPECIES WITH THE POTENTIAL TO OCCUR IN THE REGION OF THE PROPOSED PROJECT / PROPOSED ACTION SITE, *Continued*

Species	Status	Habitat	Occurrence
Owens Valley vole (*Microtus californicus vallicola*)	CSC, BLM	Found in friable soils of wetlands and lush grassy ground in the Owens Valley	Surveyed for during May 1990 survey in support of Lake Minerals project;[1] several found during 1996 surveys at the north flood irrigation plot site; found during focused surveys in Swedes Pasture and Dirty Socks Spring; sign found at Sulfur Springs and Sulfur Springs Road in 2003; not found at two air quality monitoring sites during surveys on west side of Owens Lake on August 4, 2004; determined absent as a result of small mammal trapping for supplemental dust control measures (DCMs) on Owens lake in 2007. Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area.
Southern grasshopper mouse (*Onychomys torridus ramona*)	CSC	Present in prairies and deserts in grass, sagebrush, greasewood with sandy or gravelly soil	Two found during 2003 surveys; not found at two air quality monitoring sites during surveys on west side of Owens Lake on August 4, 2004. Not observed in proposed project / proposed action area. There is suitable habitat in the proposed project / proposed action area.
American badger (*Taxidea taxus*)	CSC	Most numerous in California in the Great Basin region, fluctuating with populations of squirrels and pocket gophers, in open areas including deserts	During surveys for predatory mammals conducted in the fall of 1995; one badger sign, a badger dig, was observed in the shadscale scrub west of the Owens River riparian area. Observed in proposed project / proposed action area. There is limited suitable habitat in the proposed project / proposed action area..

KEY:
CSC = California Species of Special Concern
BLM = Bureau of Land Management (BLM) Sensitive species
FPS = Federally Protected Species
SC = State Candidate Species
NOTE: [1]Inyo County, California State Lands Commission and Bureau of Land Management. 1994. *Draft Environmental Impact Report/Environmental Impact Statement, Owens Lake Soda Ash Company Soda Ash Mining and Processing Project*. Bishop, CA.

TABLE A-3
LOCALLY IMPORTANT SPECIES WITH THE POTENTIAL TO OCCUR IN THE REGION OF THE PROPOSED PROJECT / PROPOSED ACTION SITE

Species	Status	Habitat	Occurrence
Plants			
Lincoln rock cress (*Boechera lincolnensis*)	CNPS 2	Found on limestone among Chenopod scrub, Mojavean desert scrub in Inyo County at elevation range of 3,609 to 6808 feet AMSL	Not found during 1995–1996, 1999–2001, and 2003 surveys in Owens Lake. Not observed in proposed project / proposed action area. There is suitable habitat in the proposed project / proposed action area.
Naked milk-vetch (*Astragalus serenoi* var. *shockleyi*)	CNPS 2	Chenopod scrub, great basin scrub, pinyon and juniper woodland. Dry, alkaline soils. Found on course granitic alluvium among chenopod scrub, great basin scrub at elevation range of 4,921 to 7,382 feet AMSL	Not found during 1995–1996, 1999–2001, and 2003 surveys on sites over Owens Lake. Not observed in proposed project / proposed action area. There is suitable habitat in the proposed project / proposed action area.
Booth's evening primrose (*Camissonia boothii* ssp. *boothii*)	CNPS 2	Typically associated with Joshua tree woodland and pinyon and juniper woodland; observed among stabilized dunes at Owens Lake basin at elevation range of 2,953 to 7,874 feet AMSL; blooms April to September	Not observed in proposed project / proposed action area. There is suitable habitat in the proposed project / proposed action area.
Narrow-leaved cottonwood (*Populus angustifolia*)	CNPS 2	Found along creeks and rivers in riparian forest of Inyo County at elevation range of 1,640 to 6,972 feet AMSL; flowering period is March–April	Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area.
Nevada oryctes (*Oryctes nevadensis*)	CNPS 2	Found in dry, sandy soil in washes and open scrub habitat in the Owens Valley at elevation range of 3,609 to 8,366 feet AMSL	Surveyed for in 1995–1996, 1999–2001, and 2003–2004 on Owens Lake and not found. Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area.
Alkali cord grass (*Spartina gracilis*)	CNPS 4	Found in alkali meadows and seeps of Inyo County; observed at Owens Lake basin at elevation range of 3,281 to 6,890 feet AMSL; blooms June to August	Surveyed for in 1995–1996, 1999, 2000, 2001, 2003–2004, 2007 on Owens Lake Dust Control Project sites, but not found. Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area.

TABLE A-3
LOCALLY IMPORTANT SPECIES WITH THE POTENTIAL TO OCCUR IN THE REGION OF THE PROPOSED PROJECT / PROPOSED ACTION SITE, *Continued*

Species	Status	Habitat	Occurrence
Wildlife			
Moth (no common name) (*Tescalsia giulianiata*)	Locally rare	Dune and alkali meadow habitats	Found at around Owens Lake at Olancha Dunes and Southwest Seeps during 1995–1996 surveys; records exists 9 miles northwest of Keeler Dunes; determined to be potentially present at the proposed project site based on known records and notes from the late Mr. Giuliani, the foremost expert on this species. Not observed in proposed project / proposed action area. There is suitable habitat in the proposed project / proposed action area.
Alkali skipper (*Pseudocopaeodes eunus*)	Locally rare	Dune and alkali meadow habitats	Not observed during 2011-2012 surveys in proposed project / proposed action area. There is suitable habitat in the proposed project / proposed action area.
Owens valley tiger beetle (*Cicindela tranquebarica inyo*)	Locally rare	Dune and alkali meadow habitats	Occurrences of this species around Owens Lake including observations around the Channel Area in 2007. Not observed in proposed project / proposed action area. There is suitable habitat in the proposed project / proposed action area.
Alkali flats tiger beetle (*Cicindela willistoni pseudosenilis*)	Locally rare	Dune and alkali meadow habitats	Historical records of this species at Keeler and around Owens Lake. Not observed in proposed project / proposed action area. There is suitable habitat in the proposed project / proposed action area.
Short-legged tiger beetle (*Cicindela tenuicincta*)	Locally rare	Dune and alkali meadow habitats	Minimal records around Owens lake; determined to be absent from the proposed project site. Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area.
Owens dune weevil (*Trigonoscuta owensii*)	Locally rare	Dune and alkali meadow habitats	Several individuals detected in 2011 and one in 2012 at Keeler Dunes. There is suitable habitat in the proposed project / proposed action area.
Monarch butterfly (*Danaus plexippus*)	Locally rare	Closed-cone coniferous forest. Winter roost sites are typically located in wind-protected tree groves (eucalyptus, pine, and cypress), with nectar and water sources nearby	Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area.

TABLE A-3
LOCALLY IMPORTANT SPECIES WITH THE POTENTIAL TO OCCUR IN THE REGION OF THE PROPOSED PROJECT / PROPOSED ACTION SITE, *Continued*

Species	Status	Habitat	Occurrence
Franklin's gull (*Larus pipixcan*)	Locally rare	Nests in marshes and along inland lakes; winters along coast in bays, estuaries, and along sandy beaches	Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area.
Nuttall's woodpecker (*Picoides nuttallii*)	BCC	Mix of deciduous riparian and adjacent oak habitats; occurs as a vagrant in the Owens Valley	Not observed in proposed project / proposed action area. There is no suitable habitat in the proposed project / proposed action area.
Bell's sparrow (*Amphispiza belli canensis*)	BCC	Found in sagebrush, arid bushland, and chaparral habitats; desert populations breed during winter in the Owens Valley	Observed at Bartlett Spring during initial site visit in January 2007. Observed in proposed project / proposed action area. There is suitable habitat in the proposed project / proposed action area.

KEY:
California Native Plant Society (CNPS) ranking system =
- List 1B: Rare, threatened or endangered in California and elsewhere.
- List 2: Plants is rare, threatened or endangered in California but more common elsewhere.
- List 3: Plants about which we need more information.
- List 4: Plants of limited distribution.
- Threat ranks:
- 0.1: Seriously threatened in California.
- 0.2: Fairly threatened in California.
- 0.3: Not very threatened in California.

Locally rare = Designated as locally important by Inyo County, the Audubon Society, or the California Department of Fish and Game (CDFG)
BCC = Bird of Conservation Concern
BLM = Bureau of Land Management (BLM) Sensitive species

APPENDIX B
PHOTO STATION PICTURES

Photo Station 1. Looking north

Photo Station 1. Looking east


Photo Station 1. Looking south


Photo Station 1. Looking west

Photo Station 2. Looking north

Photo Station 2. Looking east

Photo Station 2. Looking south

Photo Station 2. Looking west

Photo Station 3. Looking north

Photo Station 3. Looking east


Photo Station 3. Looking south

Photo Station 3. Looking west


Photo Station 4. Looking north

Photo Station 4. Looking east

Photo Station 4. Looking south

Photo Station 4. Looking west


Photo Station 5. Looking north


Photo Station 5. Looking east

Photo Station 5. Looking south

Photo Station 5. Looking west


Photo Station 6. Looking north


Photo Station 6. Looking east

Photo Station 6. Looking south

Photo Station 6. Looking west

Photo Station 7. Looking north

Photo Station 7. Looking east

Photo Station 7. Looking south

Photo Station 7. Looking west

Photo Station 8. Looking north

Photo Station 8. Looking east

Photo Station 8. Looking south

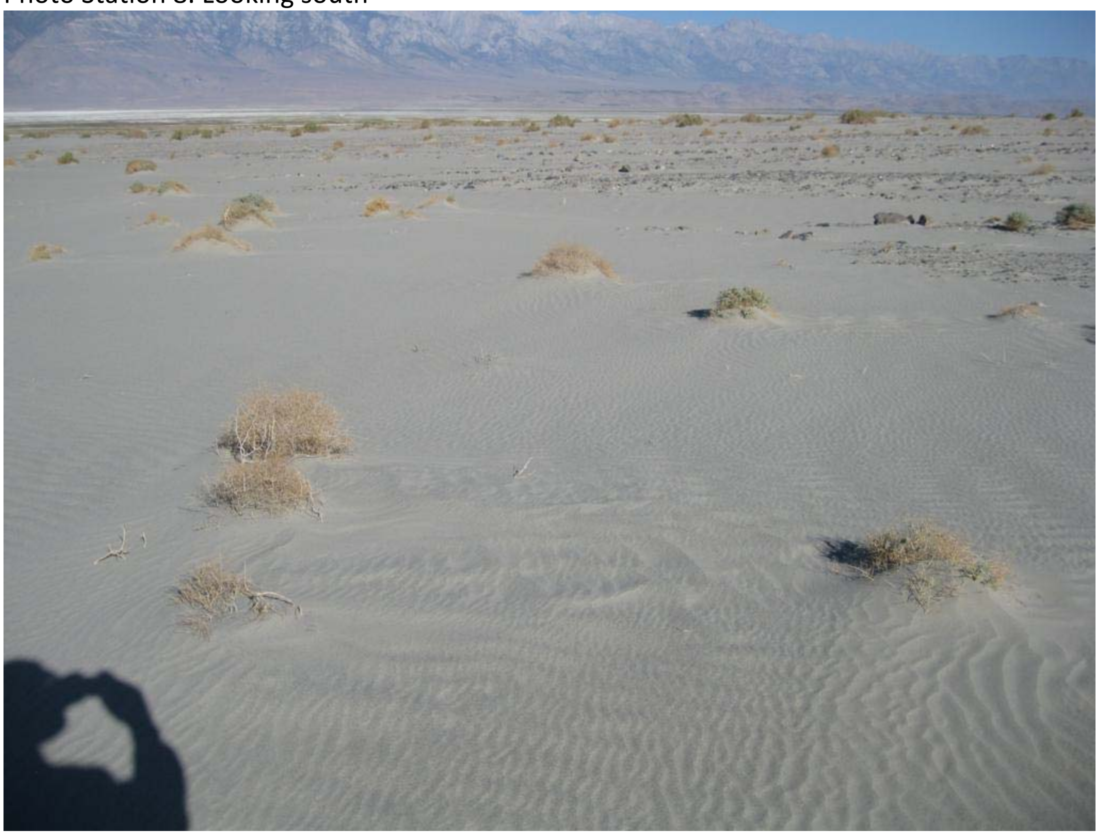

Photo Station 8. Looking west

Photo Station 9. Looking north

Photo Station 9. Looking east

Photo Station 9. Looking south

Photo Station 9. Looking west


Photo Station 10. Looking north

Photo Station 10. Looking east

Photo Station 10. Looking south

Photo Station 10. Looking west

Photo Station 11. Looking north

Photo Station 11. Looking east

Photo Station 11. Looking south

Photo Station 11. Looking west

Photo Station 12. Looking north

Photo Station 12. Looking east


Photo Station 12. Looking south


Photo Station 12. Looking west

Photo Station 13. Looking north

Photo Station 13. Looking east

Photo Station 13. Looking south

Photo Station 13. Looking west

Photo Station 14. Looking south

Photo Station 14. Looking southwest


Photo Station 15. Looking west


Photo Station 15. Looking south


Photo Station 15. Looking east


Photo Station 15. Looking north

Photo Station 16. Looking south

Photo Station 16. Looking northwest

Photo Station 16. Looking west

Photo Station 17. Looking northwest

Photo Station 17. Looking southeast

Photo Station 18. Looking north

Photo Station 19. Looking north

Photo Station 20. Looking north

APPENDIX C
FLORAL AND FAUNAL COMPENDIUM

PLANTS

Apiaceae – Carrot Family

Lomatium mohavense
Mojave desert parsley

Asclepiadaceae – Milkweed Family

Asclepias erosa
desert milkweed

Asteraceae – Composite Family

Psathyrotes ramosissima
turtleback
Ambrosia dumosa
white-burr sage
Ambrosia salsola
cheesebush

Brassicaceae – Mustard Family

Cleome sparsifolia
fewleaf spiderflower

Cactaceae – Cactus Family

Echinocactus polycephalus var. *polycephalus*
cottontop cactus
Opuntia basilaris var. *basilaris*
beavertail cactus

Capparaceae – Caper Family

Cleomella obtusifolia
Mohave stinkweed

Chenopodiaceae – Goosefoot Family

Atriplex confertifolia
shadscale
Atriplex hymenelytra
desert holly
Atriplex parryi
Parryi saltbush

Atriplex phyllostegia
leafcover saltweed
Salsola tragus
Russian thistle
Sarcobatus vermiculatus
greasewood
Suaeda nigra
bush seepweed

Cuscutaceae – Dodder Family

Cuscuta californica
California dodder

Euphorbiaceae – Spurge Family

Chamaesyce vallis-mortae
Indian spurge

Onagraceae – Primrose Family

Camissonia claviformis
brown-eyed primrose
Camissonia sp.
primrose

Poaceae – Grass Family

Distichlis spicata
saltgrass
Bromus Sp.
brome sp.

Zygophyllaceae – Caltrop Family

Larrea tridentata
creosote bush

WILDLIFE

TERRESTRIAL INVERTEBRATES

Insects

Cicindela spp.
tiger beetles
Eleodes spp.
darkling beetle
Monomorium minimum
black ant
Pogonomyrmex rugosus
red harvester ants
Tabanus punctifer
horsefly
Trigonoscuta owensii
dune weevil
Trimerotropis pallidipennis
pallid-winged grasshopper

Spiders

Latrodectus hesperus
black widow
Thomisidae family
crab spider

TERRESTRIAL VERTEBRATES

Reptiles

Iguanidae – Iguanid Lizards

Dipsosaurus dorsalis
desert iguana

Crotaphytidae – Collared and Leopard Lizards

Gambelia wislizenii
long-nosed leopard lizard

Phrynosomatidae – Zebra-Tailed, Spiny, Tree, and Horned Lizards

Callisaurus draconoides
zebra-tailed lizard
Phrynosoma platyrhinos
desert horned lizard
Sceloporus magister
desert spiny lizard

Uta stansburiana
common side-blotched lizard

Teiidae – Whiptail Lizards

Aspidoscelis tigris
western whiptail

Anguidae – Alligator Lizards and Relatives

Elgaria multicarinata multicarinata
alligator lizard

Colubridae – Colubrid Snakes

Masticophis flagellum
coachwhip
Pituophis catenifer
gopher snake

Viperidae – Vipers

Crotalus cerastes
sidewinder

Birds

Odontophoridae – Quails

Callipepla californica
California quail

Cathartidae – New World Vultures

Cathartes aura
turkey vulture

Accipitridae – Hawks

Accipiter cooperii
Cooper's hawk
Buteo jamaicensis
red-tailed hawk

Falconidae – Falcons

Falco sparverius
American kestrel
Falco mexicanus
prairie falcon

Columbidae – Pigeons and Doves

Zenaida macroura
mourning dove

Cuculidae – Cuckoos and Roadrunners

Geococcyx californianus
greater roadrunner

Tytonidae – Barn Owls

Tyto alba
barn owl

Strigidae – True Owls

Bubo virginianus
great horned owl

Caprimulgidae – Goatsuckers

Chordeiles acutipennis
lesser nighthawk

Trochilidae – Hummingbirds

Archilochus alexandri
black-chinned hummingbird
Calypte anna
Anna's hummingbird

Tyrannidae – Tyrant Flycatchers

Sayornis saya
Say's phoebe
Tyrannus verticalis
western kingbird

Laniidae – Shrikes

Lanius ludovicianus
loggerhead shrike

Corvidae – Jays and Crows

Corvus corax
common raven

Alaudidae – Larks

Eremophila alpestris
horned lark

Hirundinidae – Swallows

Tachycineta bicolor
tree swallow
Stelgidopteryx serripennis
northern rough-winged swallow
Hirundo pyrrhonota
cliff swallow
Hirundo rustica
barn swallow

Aegithalidae – Bushtits

Psaltriparus minimus
bushtit

Troglodytidae – Wrens

Salpinctes obsoletus
rock wren
Thryomanes bewickii
Bewick's wren
Troglodytes aedon
house wren

Regulidae – Kinglets

Regulus calendula
ruby-crowned kinglet

Sylviidae – Gnatcatchers

Polioptila caerulea
blue-gray gnatcatcher

Mimidae – Thrashers

Mimus polyglottos
northern mockingbird
Toxostoma lecontei
Le Conte’s thrasher

Motacillidae – Pipits

Anthus rubescens
American pipit

Parulidae – Wood Warblers

Dendroica coronata
yellow-rumped warbler

Emberizidae – Buntings and Sparrows

Chondestes grammacus
lark sparrow
Amphispiza belli
sage sparrow
Passerculus sandwichensis
savannah sparrow
Zonotrichia leucophrys
white-crowned sparrow
Junco hyemalis
dark-eyed junco

Icteridae – Blackbirds and Orioles

Sturnella neglecta
western meadowlark

Fringillidae – Finches

Carpodacus mexicanus
house finch
Carduelis psaltria
lesser goldfinch

Mammals

Soricidae – Shrews

Notiosorex crawfordi
desert shrew

Vespertilionidae – Vesper Bats

Euderma maculatum
spotted bat
Myotis yumanensis
Yuma myotis
Myotis californicus
California myotis

Molossidae – Free-Tailed Bats

Tadarida brasiliensis
Mexican free-tailed bat

Leporidae – Hares & Rabbits

Sylvilagus audubonii
desert cottontail
Lepus californicus
black-tailed jackrabbit

Sciuridae – Squirrels

Ammospermophilus leucurus
white-tailed antelope squirrel
Spermophilus beecheyi
California ground squirrel

Geomyidae – Pocket Gophers

Thomomys bottae
Botta's pocket gopher

Heteromyidae – Pocket Mice and Kangaroo Rats

Chaetodipus californicus
California pocket mouse
Dipodomys deserti
desert kangaroo rat

Muridae – Mice, Rats, and Voles

Neotoma lepida
desert woodrat
Peromyscus maniculatus
deer mouse

Canidae – Wolves and Foxes

Canis latrans
coyote
Urocyon cinereoargenteus
grey fox
Vulpes macrotis
desert kit fox

Procyonidae – Raccoons and Ringtails

Bassariscus astutus
ringtail
Procyon lotor
raccoon

Mustelidae – Weasels, Skunks, and Otters

Taxidea taxus
American badger

Felidae – Cats

Felis rufus
bobcat

APPENDIX E
CULTURAL RESOURCES TECHNICAL REPORT

KEELER DUNES DUST CONTROL PROJECT
CULTURAL RESOURCES TECHNICAL REPORT

SUBMITTED TO:

BUREAU OF LAND MANAGEMENT
BISHOP FIELD OFFICE
351 PACU LANE, SUITE 100
BISHOP, CA 93514

PREPARED FOR:

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT
157 SHORT STREET, SUITE 6
BISHOP, CA 93514-3537

PREPARED BY:

SAPPHOS ENVIRONMENTAL, INC.
430 NORTH HALSTEAD STREET
PASADENA, CALIFORNIA 91107

MARCH 21, 2014

TABLE OF CONTENTS

SECTIONS **PAGE**

TABLE ***PAGE***

FIGURE — ***FOLLOWS PAGE***

IMAGE — ***PAGE***

APPENDICES

SECTION ES
EXECUTIVE SUMMARY

I. TITLE OF PROJECT: Keeler Dunes Dust Control Project

II. AGENCY: Bureau of Land Management (BLM)

III. PERMITS: BLM Cultural Resource Use Permit No. CA-10-37 (Authorization Request No. CA-170-11-22)

IV. LOCATION: The proposed project / proposed action study area is located immediately northwest of Keeler, Inyo County, California. The proposed project / proposed action study area includes Sections 30, 31, and 32, Township 16 South, Range 37 East; and Sections 24, 25, and 36, Township 16 South, Range 38 East, Mount Diablo Baseline and Meridian, California.

V. DATES OF FIELD RECORDATION: September 25–26, 2012, and February 20, 2014

VI. SUMMARY OF SURVEY ACTIVITES:

- **i. Total Acreage of the Area of Potential Effect:** 323.2 acres

- **ii. Total Acreage of Proposed Project Study Area:** 870 acres

- **iii. Acreage of Land Surveyed at the BLM Class II and/or Class III Levels:** 0

- **iv. Number of Newly Recorded Cultural Properties**: 22
  1. Number of Newly Recorded Cultural Properties on BLM Lands: 20
  2. Number of Newly Recorded Cultural Properties on Other Lands: 2

- **v. Total Number of Cultural Properties Located within the Area of Potential Effect:** 4 (P-14-7840/CA-INY-6502, P-14-7851/CA-INY-6513H, BLM Site 1, KD Site 1, and KD Site 2)

- **vi. National Register Eligibility of Cultural Properties within the Area of Potential Effect:**
  1. Number of Register-Eligible Cultural Properties: 2
  2. Number of Ineligible Cultural Properties: 20
  3. Number of Cultural Properties that Can Be Avoided: 0
  4. Number of Cultural Properties that Would Be Affected: 4

SECTION 1.0
INTRODUCTION

This Cultural Resources Technical Report was prepared to characterize the proposed Keeler Dunes Dust Control Project (proposed project / proposed action) area with respect to cultural resources, related plans of development, and regulatory statutes and guidelines. The proposed project / proposed action would consist of land modifications on the Keeler Dunes as a method to implement dust control measures (DCMs) designed to reduce fugitive dust emissions consistent with the requirements of the National Ambient Air Quality Standards (NAAQS). The proposed project / proposed action study area of approximately 870 acres is located within the northeastern portion of the Owens Valley in Inyo County, California, on lands administered by the U.S. Department of Interior Bureau of Land Management (BLM) Bishop Field Office and the City of Los Angeles Department of Water and Power (LADWP). Of the 870 acres, the area of potential effect (APE), or those portions of the proposed project / proposed action area that are likely to be physically affected by ground disturbance associated with the proposed project / proposed action, is approximately 323.2 acres.

The proposed action is considered an undertaking under Section 106 of the National Historic Preservation Act (NHPA) of 1966 (36 Code of Federal Regulations [CFR] 800.16[y]). Acting in its capacity as the lead agency under the NHPA, the BLM would need to take into account the effects of this proposed undertaking on properties listed in or eligible for listing in the National Register of Historic Places (NRHP). The BLM requires sufficient information with regard to the location and nature of potentially significant cultural resources to be able to make a determination of effects of the undertaking on those resources under NHPA and to make a determination regarding the appropriate level of environmental compliance documentation pursuant to the National Environmental Policy Act (NEPA).

The cultural investigation of the proposed project / proposed action area was requested by the Great Basin Unified Air Pollution Control District (District). The investigation was performed by Sapphos Environmental, Inc., under the supervision of Dr. Tiffany Clark, Archaeological Resources Specialist, in consultation with the BLM Bishop Field Office (Mr. Greg Haverstock, Archaeologist).

1.1 GOAL OF THE PROPOSED PROJECT / PROPOSED ACTION

The Great Basin Unified Air Pollution Control District (District) regulates fugitive dust (PM_{10}) emissions in the Owens Valley Planning Area (OVPA) consistent with the requirements of the National Ambient Air Quality Standards (NAAQS). The dried Owens Lake Bed has been the largest single source of PM_{10} emissions in the United States for many years, with peak annual PM_{10} emissions of more than 80,000 tons and 24-hour concentrations as high as 130 times the federal air quality standard. The air pollution at Owens Lake is caused by the City of Los Angeles's diversion of water from the Owens River and other streams that once flowed into Owens Lake. These waters have historically been diverted from the Owens Valley to the City of Los Angeles via the Los Angeles Aqueduct. By the 1920s, all that remained of the lake was a 26-square-mile hyper-saline brine pool, and by 1930, Owens Lake was virtually dry.[1]

[1] Great Basin Unified Air Pollution Control District. January 2008. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan—Final Subsequent Environmental Report*. Prepared by: Sapphos Environmental, Inc., Pasadena, CA. Bishop, CA.

Exposed dry lake bed sediments have been dispersed into the air by prevailing winds over approximately the past 100 years. The resulting severe dust storms occur primarily from October through June, with the highest frequency of dust events occurring March through May and also in December. The northeastern portion of the Owens Lake bed, an area termed the North Sand Sheet (NSS), was one of the largest dust source areas. The NSS soil composition is primarily made up of sediment from the Owens River, with a smaller portion from the Inyo Mountains east of the lake. Over time, wind and water have reworked the Keeler Dunes sand deposits, which currently extend over an approximately 1.36-square-mile area. The Keeler Dunes appear to be spreading to the east and southeast toward the community of Keeler and the foothills of the Inyo Mountains.

Although dust sources on the bed of Owens Lake have been largely controlled, the material from Keeler Dunes becomes mobile during high-wind events, making Keeler Dunes one of the last main dust sources contributing to PM_{10} levels above state and federal standards in the community of Keeler. As a result of data collected from sand-motion monitoring since April 2000, the District has identified the Keeler Dunes as one of the areas that need to be controlled to attain the NAAQS for PM_{10} within the OVPA.

The proposed project / proposed action, in combination with other ongoing dust control projects that have been and are being implemented on the lake bed by the LADWP, is designed to improve air quality through the reduction of PM_{10} emissions throughout the OVPA but particularly in the community of Keeler. DCMs are necessary at the Keeler Dunes to bring the community of Keeler and greater Owens Lake area into compliance with the NAAQS for PM_{10} by 2017.

1.2 PURPOSE OF THE CULTURAL RESOURCES TECHNICAL REPORT

This Cultural Resources Technical Report was prepared to characterize the cultural resources that would potentially be affected by construction, operation, and maintenance of the proposed project / proposed action. As such, the document presents data and information to be used by the BLM in making a determination of effects to cultural resources resulting from the proposed undertaking and will provide the substantial evidence required with respect to cultural resources for environmental documentation under NHPA and NEPA.

1.3 INTENDED AUDIENCE

This Cultural Resources Technical Report summarizes the results of cultural resources investigations for consideration by the BLM, District, cooperating agencies, and Native American tribes. The information contained in this report has been an integral part of the project planning effort, which has attempted to avoid and minimize adverse effects to cultural resources to the maximum extent practicable while attaining the objectives of the proposed project / proposed action. The report details the findings of archaeological and paleontological records searches undertaken at the Eastern Information Center (EIC) at the University of California, Riverside; the BLM Bishop Field Office; the Native American Heritage Commission (NAHC); the Natural History Museum of Los Angeles County; and the San Bernardino County Museum. In addition, data are presented on two historic period archaeological sites that were recorded during the current work effort by Sapphos Environmental, Inc. in the proposed project / proposed action area. Finally, the report documents and summarizes the coordination and consultation that has been undertaken by the BLM with Native American representatives.

The location data for the archaeological resources will not be circulated for public review. To protect the sites from unauthorized excavation, looting, and/or vandalism, the locations of known archaeological resources will be kept confidential beyond what is necessary. Information concerning the nature and location of archaeological resources is protected under the Archaeological Resources Protection Act (16 U.S.C. 470 hh) and other statutes. Records in the information centers are exempt from the California Public Records Act (Government Code Section 6250 *et seq.*). Government Code Section 6254.10 states,

> Nothing in this chapter requires disclosure of records that relate to archaeological site information and reports maintained by, or in the possession of, the Department of Parks and Recreation, the State Historical Resources Commission, the State Lands Commission, the Native American Heritage Commission, another state agency, or a local agency, including the records that the agency obtains through a consultation process between a California Native American tribe and a state or local agency.

Government Code Section 6254(r) explicitly authorizes public agencies to withhold information from the public relating to "Native American graves, cemeteries, and sacred places maintained by the Native American Heritage Commission." Due to the sensitive nature of cultural resources described herein, this report is confidential and meant for the exclusive use of the BLM and other trustee and responsible agencies related to planning, installation, operation, maintenance, and management of the proposed project / proposed action.

1.4 SCOPE OF THE PROPOSED PROJECT / PROPOSED ACTION

The analysis of cultural resources consists of a summary of the regulatory framework of Section 106 of the NHPA Act of 1966, as amended (16 U.S.C. 40 *et seq.*), that guides the decision-making process with respect to historic properties, a description of the methods employed to support the characterization and evaluation of cultural resources within the proposed project / proposed action area, the results for baseline conditions for cultural resources, the potential for the proposed project / proposed action to affect cultural resources, and, if appropriate, opportunities to avoid and minimize the potential affects of the proposed project / proposed action.

1.5 SOURCES OF RELEVANT INFORMATION

Information used in the preparation of this Cultural Resources Technical Report primarily derives from a Class I literature review, including published and gray literature, Class III survey, informal consultation with cooperating agencies, and spatial analysis based on geographic information system data. In addition, information is also presented from two historic period sites that were recorded within the proposed project / proposed action area by Sapphos Environmental, Inc. Sources of relevant information are cited in footnotes and compiled in Section 6, *References*.

1.6 WORKING DEFINITIONS

A number of technical terms are used in the characterization of baseline conditions and assessment of the potential for the proposed project / proposed action to affect cultural resources.

Archaeological site is defined by the NRHP as the place or places where the remnants of a past culture survive in a physical context that allows for the interpretation of these remains. Archaeological remains usually take the form of artifacts (e.g., fragments of tools, vestiges of utilitarian or non-utilitarian objects), features (e.g., remnants of walls, cooking hearths, or midden deposits), and ecological evidence (e.g., pollen remaining from plants that were in the area when the activities occurred).[2] Prehistoric archaeological sites represent the material remains of Native American groups and their activities. These sites are generally thought to date to the period before European contact but, in some cases, may contain evidence of trade contact with Europeans. Historic archaeological sites reflect the activities of nonnative populations during the historic period.

Area of potential effect (APE) measures 323.2 acres and consists of the portions of the proposed project / proposed action area that have been designated for DCMs, three of the four staging areas, and temporary access routes. These areas have the potential to be subjected to direct effects, such as ground disturbance resulting from the planting and establishment of native vegetation, construction of temporary access routes, and a temporary water delivery system. The APE includes a 100-foot buffer area surrounding the areas that are subject to direct ground disturbance that will account for indirect effects such as dust, foot traffic, and so forth.

Class I inventory is defined as a professional review of available cultural resource data and literature for a given area. This data may come from published and unpublished documents, BLM cultural resource inventory records, institutional site files, state and national registers, interviews, and other information sources.[3]

Class III survey is defined as an intensive, pedestrian survey of an entire target area to identify and record all historic properties.[4]

Cultural resources study area includes areas evaluated for the presence of previously recorded prehistoric and historic period cultural resources through record searches, agency consultation, and archival research. The cultural resources study area measures approximately 6,433 acres and consists of the entirety of the 870-acre proposed project / proposed action study area plus a 1-mile buffer.

Historic period is defined as the period that begins with the arrival of the first nonnative population and thus varies by area. Most Southern California archaeologists use AD 1782 as the date to mark the beginning of the historic period, following the beginning of the Spanish colonization of inland California.

Isolate is defined as an isolated artifact or small group of artifacts that appear to reflect a single event, loci, or activity. It may lack identifiable context but has the potential to add important information about a region, culture, or person. Isolates do not require avoidance or mitigation under NHPA because they lack contextual integrity and, therefore, are unlikely to meet the criteria for inclusion in the NRHP.

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[2] U.S. Department of the Interior, National Park Service. 2000. *National Register Bulletin: Guidelines for Evaluating and Registering Archeological Properties*. Available at: http://www.cr.nps.gov/nr/publications/bulletins/arch/

[3] U.S. Department of the Interior, Bureau of Land Management. 2004. *MS-8110 Identifying and Evaluating Cultural Resources*. Available at: http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/blm_manual.Par.23101.File.dat/8110.pdf

[4] U.S. Department of the Interior, Bureau of Land Management. 2004. *MS-8110 Identifying and Evaluating Cultural Resources*. Available at: http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/blm_manual.Par.23101.File.dat/8110.pdf

Native American sacred site is defined as an area that has been, and often continues to be, of religious significance to Native American peoples, such as an area where religious ceremonies are practiced or an area that is central to their origins as a people.

Proposed project / proposed action area is the study area defined by the District for the possible implementation of DCMs. The proposed project / proposed action area measures approximately 870 acres and is located on BLM- and LADWP-administered lands in Inyo County, California. Not all portions of the project / proposed action area will be subjected to DCMs.

SECTION 2.0
PROJECT DESCRIPTION

The description of the proposed project / proposed action includes its precise location and boundaries; the elements that constitute the proposed undertaking; and a brief characterization of the existing conditions at the proposed project / proposed action area.

2.1 LOCATION

The proposed project / proposed action area is located immediately north-northwest of the community of Keeler, California, and east of the 110-square-mile (70,000-acre) Owens Lake Bed, in the Owens Valley, Inyo County, California (Figure 2.1-1, *Regional Vicinity Map*). It is situated approximately 10 miles southeast of the town of Lone Pine and approximately 65 miles southeast of the City of Bishop. There are two communities in the immediate vicinity of the proposed project / proposed action area located in the unincorporated area of Inyo County. These include: the community of Keeler, southeast and adjacent to the proposed project / proposed action area, and the community of Swansea to the north. In the general vicinity of Owens Lake are the towns of Lone Pine to the northwest and Olancha and Cartago to the southwest. One designated Native American reservation, the Lone Pine Paiute-Shoshone Indian Reservation, is located near the town of Lone Pine, northwest of the proposed project / proposed action area (Figure 2.1-1). The proposed project / proposed action is located within the OVPA (Figure 2.1-2, *Proposed Project in Relation to Owens Valley Planning Area*). The OVPA is situated in the southern end of the Owens Valley, and implementation of various dust control measures on the former bed of Owens Lake has been ongoing since the year 2000.

The proposed project / proposed action area is approximately 870 acres (1.36 square miles) (Figure 2.1-3, *Project Location Map*). The proposed project / proposed action area extends approximately 2.5 miles to the northwest from the community of Keeler and is bisected by California State Route 136 (SR 136); the alignment for the Old State Highway runs along the western boundary of the proposed project / proposed action area. The proposed project / proposed action is located on lands administered primarily by the BLM Bishop Field Office and the LADWP. Other stakeholders include Inyo County, Lahontan Regional Water Quality Control Board, Lone Pine-Paiute Shoshone Tribe, Big Pine Band of Owens Valley, Bishop Paiute Tribe, Fort Independence Indian Community of Paiute Indians, Timbisha Shoshone Tribe, California State Lands Commission, Office of Historic Preservation, Native American Lands Commission, Caltrans District 9, Southern Pacific Railroad, Keeler Community Services District, and Keeler residents.

The proposed project / proposed action area is situated on the western portion of the Keeler alluvial fan between the Inyo Mountains to the east-northeast and the dried bed of Owens Lake to the west-southwest. The proposed project / proposed action is within the U.S. Geological Survey (USGS) 7.5-minute series topographic quadrangles Owens Lake[1] and Dolomite[2] (Figure 2.1-4, *Topographic Map of Proposed Project Area with USGS 7.5-Minute Quadrangle Index*). Specifically, the proposed project / proposed action is located in Sections 30, 31, and 32, Township 16 South, Range 37 East; and Sections 24, 25, and 36, Township 16 South, Range 38 East, Mount Diablo Baseline and Meridian, California. The topographic relief of the proposed project / proposed action study area is 285 feet, with the elevation ranging from 3,600 feet above

[1] U.S. Geological Survey. 1987. *7.5-Minute Series, Owens Lake, California, Topographic Quadrangle*. Denver, CO

[2] U.S. Geological Survey. 1987. *7.5-Minute Series, Dolomite, California, Topographic Quadrangle*. Denver, CO.

mean sea level (MSL) near the historic shore of Owens Lake to 3,885 feet above MSL on the upper portion of the alluvial fan.

2.2 EXISTING CONDITIONS

The current environs of the Keeler Dunes area consist of sand sheets with several active sand dune areas. Recent research completed by the Desert Research Institute on behalf of the District indicates that while portions of these dunes may have been formed during periods of lake regression in the early Holocene, the greatest depositional period has been in the past 100 years since the desiccation of the lake following diversions by LADWP beginning in 1913.[3] The proposed project / proposed action area is intersected by SR 136, which runs along the eastern edge of Owens Lake. A water diversion structure, which was built by Caltrans to divert runoff from the area upslope of the highway, is located east of the paved roadway (see Figure 2.1-4).

The Keeler Dunes area is characterized by a Desert Scrub plant community. Portions of the area west of State Route 136 contain active sand sheets and dunes, which are largely devoid of vegetation. Sparse vegetal cover, almost exclusively consisting of Parry's saltbush (*Atriplex parryii*), is found interspersed among the active dune areas. Denser plant communities composed of saltbush, greasewood (*Sarcobatus vermiculatus*), burrobush (*Ambrosia dumosa*), and cheesebush (*Hyumenoclea salsola*) are located upslope of the dunes complex to the east of State Route 136.

2.3 ELEMENTS

The proposed project / proposed action and project alternatives consists of up to 214 acres of DCMs, in addition to temporary staging areas and temporary access routes, within the approximately 870-acre study area. The proposed project / proposed action would include the construction of various DCMs designed to achieve dust control efficiencies of 95 percent over 177 acres and 85 percent over 17 acres (Figure 2.3-1, *Location of Infrastructure Elements Common to All Action Alternatives*). Elements of the proposed project / proposed action include installation of temporary wind breaks (straw bales), planting and establishment of native vegetation, and the construction of temporary access routes and staging areas to support implementation activities (Table 2.3-1, *Dust Control Measure Elements*). The proposed project / proposed action has been designed to minimize the adverse effects of the undertaking on significant cultural resources.

TABLE 2.3-1
DUST CONTROL MEASURE ELEMENTS

Element	Minimum Control Efficiency (%)	Number of Acres	No. Required per Acre	Total No. Required
Native Vegetation (ATPO)	95	177	1,983	350,991
Native Vegetation (ATPO)	85	17	1,092	18,564
Total ATPO				369,555
Straw Bales*	95	177	661	116,997
Straw Bales*	85	17	364	6,188
Total Bales				123,185

Key: ATPO = *Atriplex polycarpa*
Note: * The dimensions of the straw bales are 0.6 x 0.4 x 1.17 meters.

[3] Great Basin Unified Air Pollution Control District. 2012. "Origin and Development of the Keeler Dunes." Available at http://gbuapcd.org/keelerdunes/originanddevelopment/.

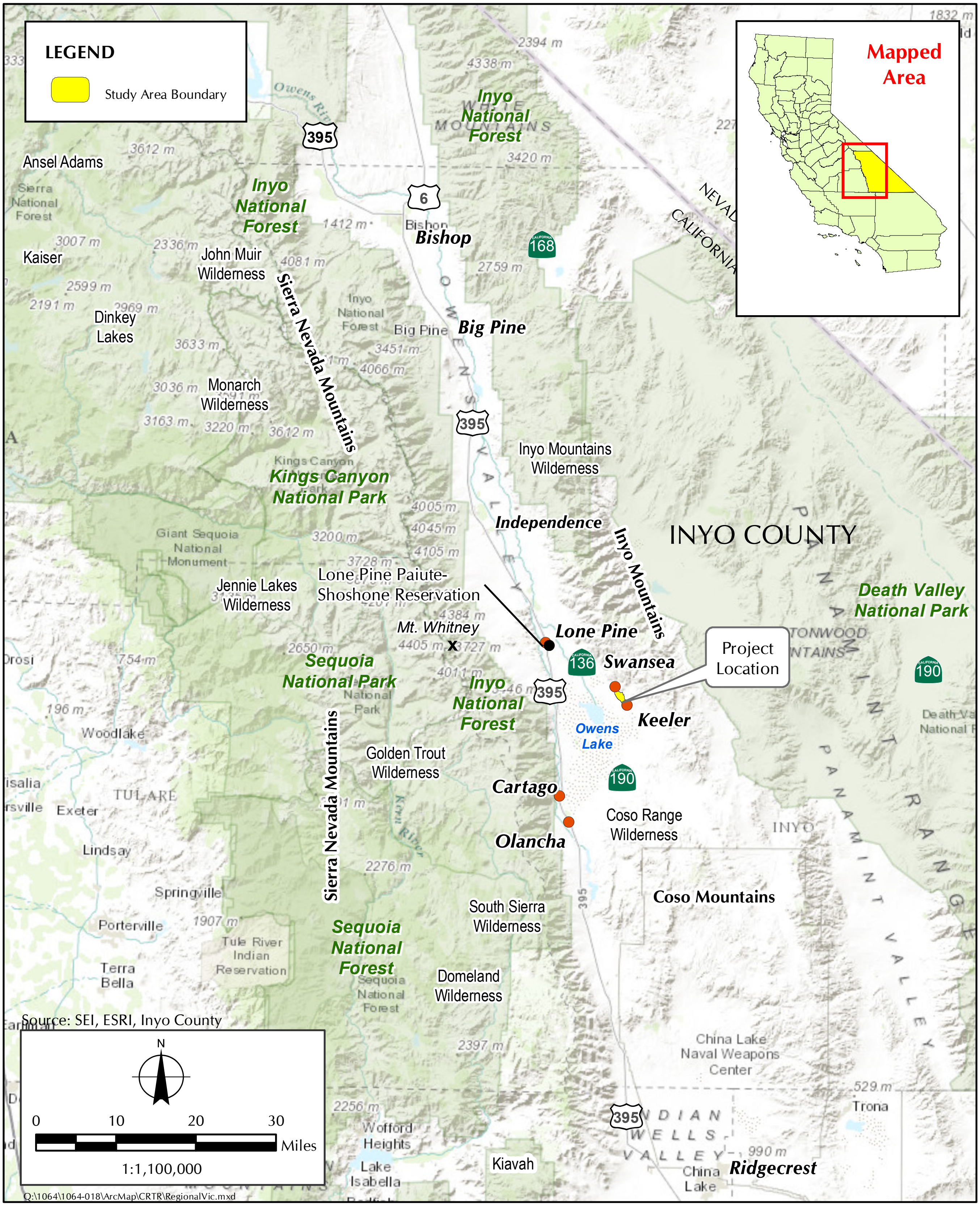

FIGURE 2.1-1
Regional Vicinity Map

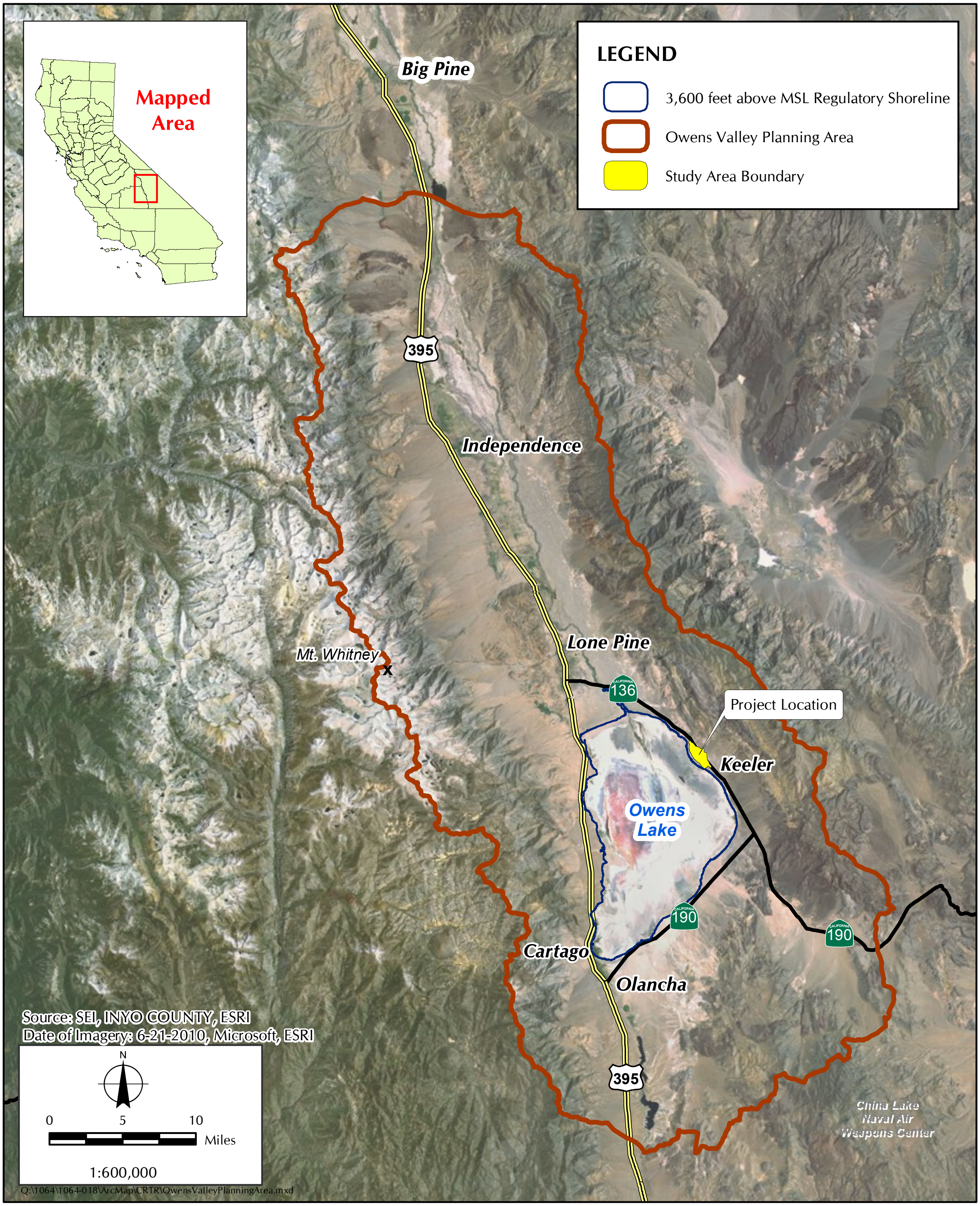

FIGURE 2.1-2

Proposed Project in Relation to Owens Valley Planning Area

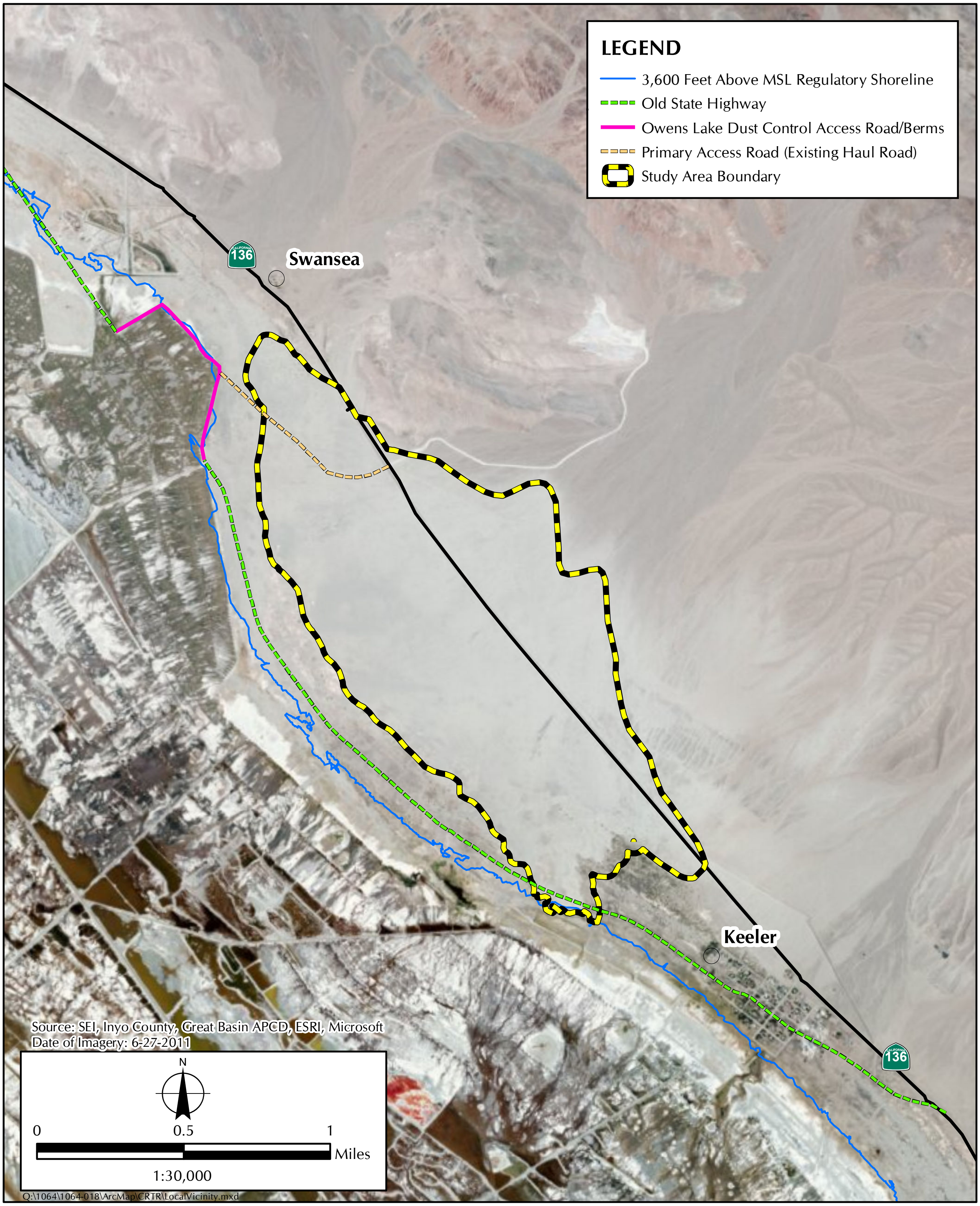

FIGURE 2.1-3

Project Location Map

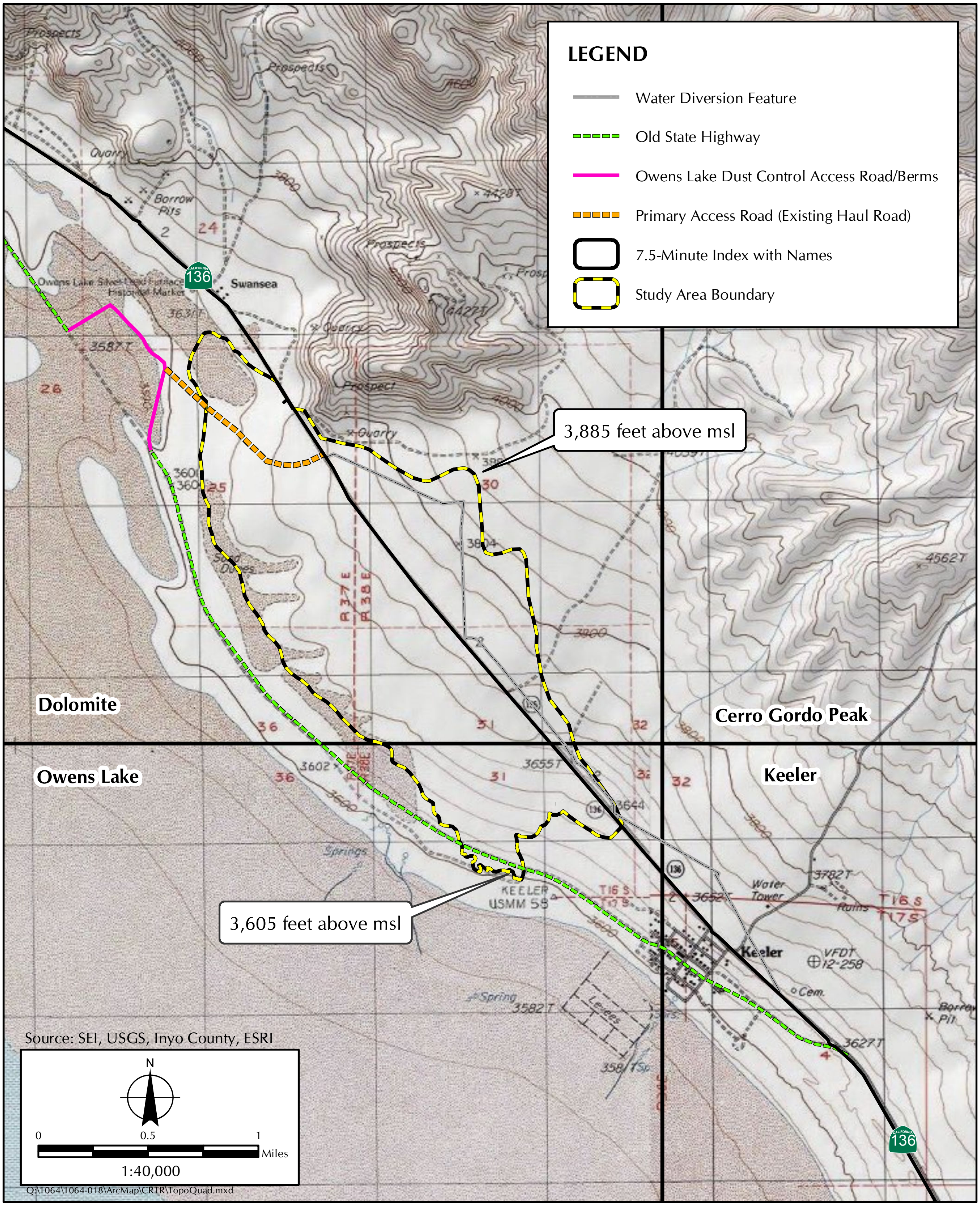

FIGURE 2.1-4

Topographic Map with USGS
7.5-Minute Quadrangle Index

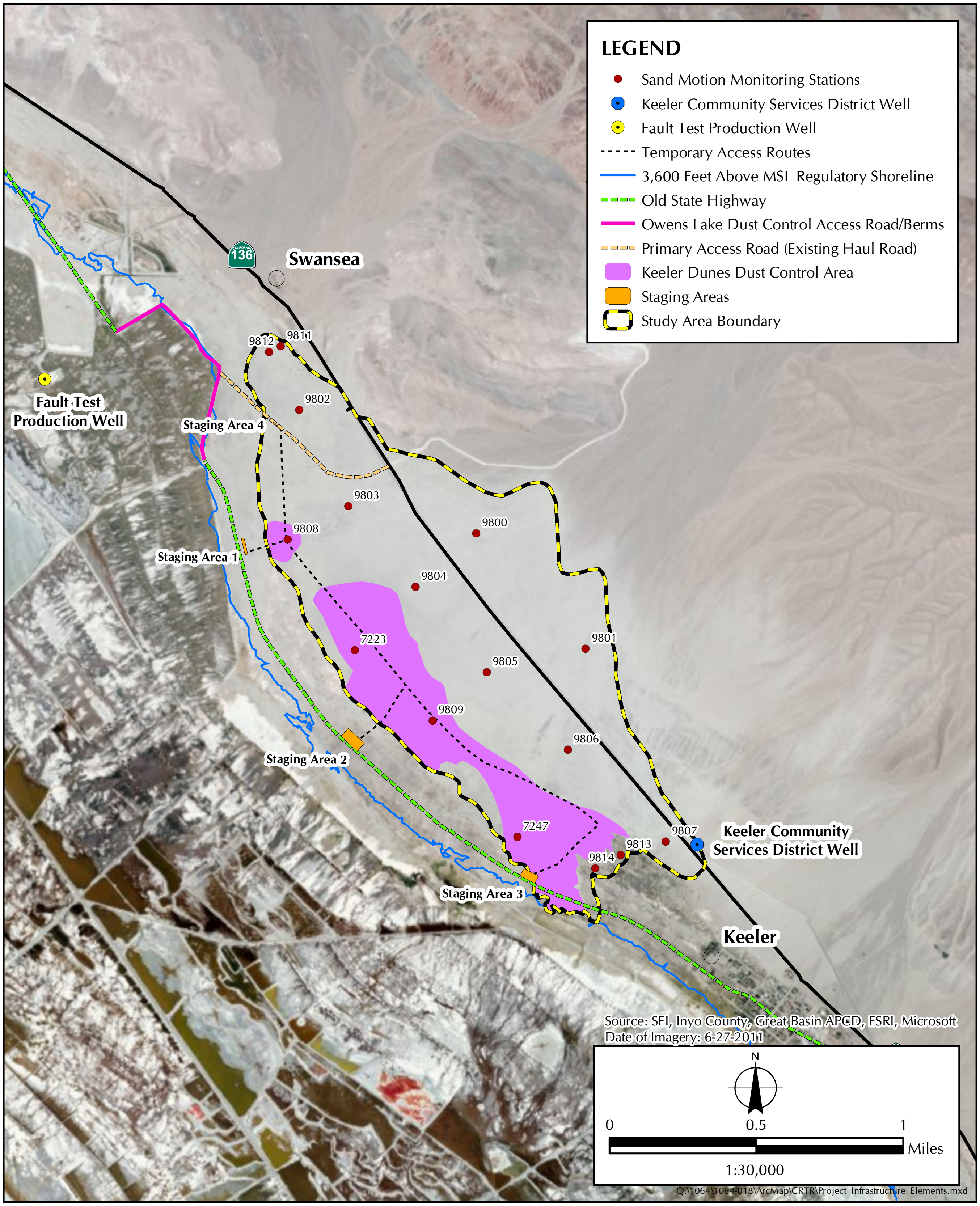

FIGURE 2.3-1

Location of Infrastructure Elements
Common to All Action Alternatives

2.3.1 Planting and Establishment of Native Vegetation

This DCM involves the establishment of a mix of native vegetation within the dust emitting areas. The goal of this work is to create a natural vegetated dune environment, similar to the existing Swansea Dunes (located to the northeast) and other stable shoreline dunes in the region (e.g., Mono Lake) that would act to prevent high emissions of dust by breaking up the wind and lowering the wind speed at the surface. Plants will be installed in a manner that mimics comparable natural environments, to the maximum extent possible given the topography and depth of the sand sheet. To achieve the estimated 85 percent and 95 percent dust control efficiencies, the plants will be spaced between 2 and 4 meters from one another. A variety of native vegetation may be planted in the dunes, including: saltbrush (*Atriplex* sp.), greasewood (*Sarcobatus vermiculatus*), Mojave stinkweed (*Cleomella obtusifolia*), fewleaf cleome (*Cleome sparsifolia*), turtleback (*Psathyrotes ramosissima*), and inkweed (*Suaeda moquinii*).

A minimal level of ground disturbance is expected to be associated with the planting of native vegetation. This work will involve the hand excavation of small holes (less than 1 foot in depth), in which individual seedlings will be placed. Seeds of native plants will also be dispersed by hand throughout these areas. All-terrain vehicles (ATVs) will be used to transport the planting materials from the staging areas to the designated dust control areas. As discussed below, a temporary route will be constructed that parallels SR 136 in order to access the dust control areas. No off-road vehicular use is expected to occur within the dust control areas.

2.3.2 Wind Breaks

This temporary DCM will be used to stabilize emissive sand sheet and dune areas in the active dune areas and provide a sheltered environment for plants during establishment. Wind breaks will consist of biodegradable vegetation (straw bales) installed in an irregular pattern across the emissive areas. Table 2.3-1 lists the estimated total numbers of straw bales needed to attain minimum 85 percent and 95 percent control efficiencies. The straw bales used within the proposed project / proposed action will measure $0.6 \times 0.4 \times 1.17$ meters in size and will be certified weed-free to minimize the threat from invasive weeds. Biodegradable barriers are anticipated to decompose over a period of several years and would provide organic material to the existing soil. Limited maintenance of biodegradable wind breaks (replacement of broken bales) is anticipated.

No ground disturbance is expected to be associated with the positioning of the biodegradable barriers. ATVs will transport the straw bales from the staging area to the designated dust control areas using a temporary access route (see below). The placement of the straw bales will occur by hand with no vehicular use expected to occur within the dust control areas.

2.3.3 Other Elements

Other elements associated with the proposed project / proposed action include temporary staging areas; an access route; and a water supply, conveyance, and distribution system (for elements and APE, see Figure 2.3.3-1, *Area of Potential Effects for Cultural Resources*).

Staging Areas

One main staging area (Staging Area 1) will be established within the northwestern edge of the proposed project / proposed action area on land administered by the BLM (Figure 2.3.3-1). Located immediately east of the Old State Highway, the facility will measure 50 feet by 300 feet in area and will be used by the contractor(s) for the storage of equipment, fuel, ATVs, wind barrier materials, native plants, and other supplies.

Two smaller staging areas will be constructed farther south along the Old State Highway (Figure 2.3.3-1). These staging areas, referred to as Staging Area 2 and Staging Area 3, will be located on land managed by LADWP and BLM, respectively. Staging area 2 will measure 200 feet by 400 feet in area while Staging Area 3 will measure 150 feet by 300 feet. The areas will be used for the temporary storage of equipment and materials needed for the implementation of DCMs in the central and southern portions of the proposed project / proposed action area.

The construction of the staging areas is expected to be limited to the removal and flattening of vegetation and, as such, should involve a minimal level of ground disturbance.

Staging Area 4 will be established adjacent to the gravel haul road constructed by the LADWP for dust mitigation on the Owens Lake, adjacent to the turn-off onto Highway 136 (Figure 2.3.3-1). This staging area will be placed on previously disturbed land within the graveled limits of the existing road; thus no vegetative removal is necessary. The area will measure approximately 10 feet by 200 feet and will be used exclusively for temporary straw bale storage.

Access Route

A temporary access route will be built and used during the construction, operation, and maintenance of the DCMs (Figure 2.3.3-1). The route will be approximately 20 feet wide and 13,478 feet long (2.5 miles) and will run along the northern extent of the APE. It can be accessed from any of the three staging areas located along the Old State Highway.

The temporary access route will be constructed without the use of supplemental materials such as asphalt or gravel; ground disturbance associated with the construction of the access route is expected to include the removal and flattening of vegetation with some minor grading. Following the completion of planting and watering activities, the temporary access route will be restored with straw bales and native plants.

Water Supply, Conveyance, and Distribution

The proposed project / proposed action and alternatives assume that the water for plant irrigation may be supplied from the District's 12-inch production well, located at the Fault Test Site, located about 0.7 mile northwest of the proposed project / proposed action boundary. The Fault Test well is an artesian (flowing) well and is capable of producing 250 gallons per minute (gpm).[4] An initial application of water at each straw bale installed in the dust control areas is expected to require approximately 985,480 gallons, which would be applied over a 2- to 4-month period. The Fault Test production well can supply 120,000 gallons over an 8-hour period, almost 8 times more than would be needed per day of watering. Another available water source includes purchased water from the Keeler Community Services District (KCSD) Well located within the southeastern portion of the proposed project / proposed action study area.[5]

[4] Holder, G., Great Basin Unified Air Pollution Control District, Bishop, CA. 9 October 2012. Telephone conversation with D. Grotzinger, Sapphos Environmental, Inc., Pasadena, CA.

[5] Holder, G., Great Basin Unified Air Pollution Control District, Bishop, CA. 20 September 2013. Email to Eric Charlton, Sapphos Environmental, Inc., Pasadena, CA.

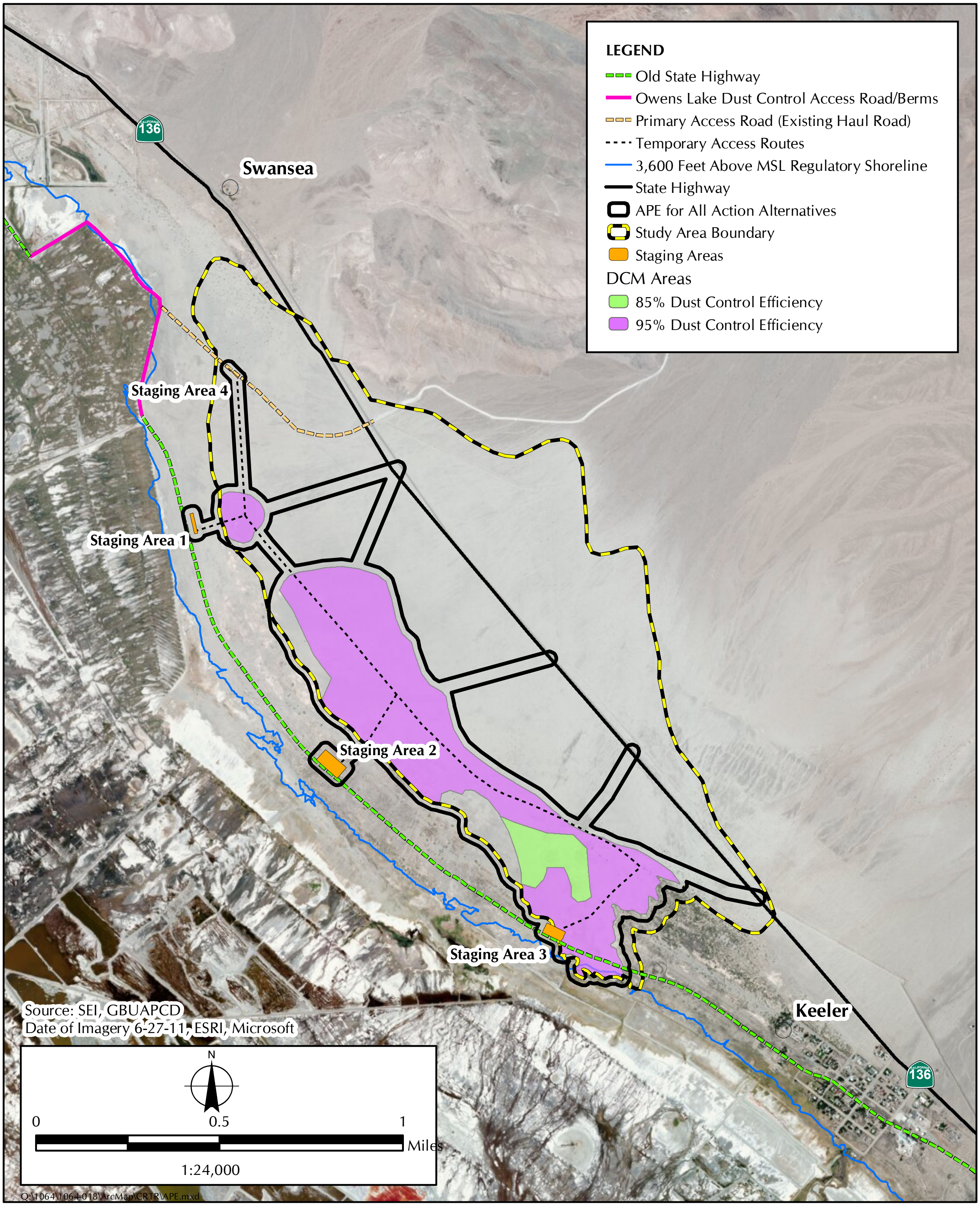

FIGURE 2.3.3-1

Area of Potential Effects for Cultural Resources

The proposed project / proposed action consists of installation and monitoring of a DCM, consisting of straw bales and native vegetation, on 194 acres within a total study area of approximately 870 acres of active and mobile sand deposits. Construction would require four staging areas and a temporary access route from each staging area to the proposed project / proposed action site.

There are also six proposed project / proposed action alternatives including a no project / no action alternative. The difference between the proposed project / proposed action and proposed project / proposed action alternatives include differences in the amount of area controlled as well as the source of water and method of irrigation for the native vegetation. The proposed project / proposed action involves DCMs applied to 194 acres using irrigation water transported by water trucks from the Fault Test (FT) well to staging areas and transferred to all-terrain vehicle (ATV) trailer tanks. Alternatives 1 and 2 are the same as the proposed project / proposed action with an increase in DCMs applied to 214 and 197 acres, respectively. Alternative 3 involves DCMs applied to 194 acres using a combination of irrigation water delivers by temporary aboveground polyvinyl chloride (PVC) pipelines and manual watering in selected areas. Alternative 3 also involves the placement of on-site 20,000-gallon water tanks within the staging areas along the Old State Highway. Alternative 4 involves dust control measures applied to 194 acres using water transported by water trucks to roadside staging areas off of State Route 136 for direct connection to a combination of irrigation water delivered by temporary aboveground PVC pipelines and manual watering in selected areas. Alternative 5 involves DCMs applied to 194 acres using water supplied via the existing Keeler Community Services District well/pipeline and delivered using a combination of irrigation water delivered by temporary aboveground PVC pipelines and manual watering in selected areas. Under Alternative 6, no DCMs would be implemented at the Keeler Dunes.

2.3.4 Pre-construction Surveys

Cultural resources protection is complicated by the shifting sand deposits that result in temporal variations in coverage and exposure of cultural resources. As part of the project design and development process, extensive coordination was undertaken by the District with BLM to develop a conceptual site plan that places project elements in a manner that avoids cultural resources. However, the potential exists, due to the shifting nature of the sand deposits, for additional cultural resources to be exposed prior to the initiation of project installation. Therefore, an additional survey will be undertaken by the District, in consultation with the BLM and Native American monitors. The results of the survey will be used as the basis for the development of the final site plan to be submitted with the right-of-way (ROW) application, demonstrating avoidance of potentially significant cultural resources, including any required corresponding refinements associated with the proposed construction scenario. Special consideration will be afforded to portions of CA-INY-6502 and KD Site1 falling within the APE. This work will involve the identification and recording of identified artifacts and features, including those previously identified within the site boundary of CA-INY-6502 and KD Site1 and any newly identified cultural deposits within the APE. A plot of the proposed project / proposed action elements, including their relation to surface artifacts and features, will be provided with the ROW application. The supplemental monitoring of the areas falling within the impact area will be undertaken by a qualified archaeologist to ensure that no cultural deposits are adversely affected by the transport and placement of the vegetation and straw bales and the delivery of water via small tanks and hoses mounted on ATVs or temporary irrigation lines. The final site plan will be adjusted to avoid the two cultural resources identified in the initial surveys and any additional cultural resources identified as a result of the supplemental surveys.

The supplemental survey for cultural resources will involve the identification and recordation of artifacts and features using handheld global positioning system (GPS) units. A spatial analysis in geographic information systems (GIS) will then be undertaken to determine the specific placement of vegetation, straw bales, foot paths, and routes of travel for ATVs or temporary irrigation lines in relationship to sensitive cultural resources to ensure the final site plan avoids these resources. The contractor shall submit a final proposed construction scenario to the lead agency for approval that depicts the location of these project elements and their relation to surface artifacts and features. An on-site archaeological monitor and Native American monitor will be required to be present during the implementation of the DCMs within culturally sensitive areas.

To ensure no paleontological resources are will be adversely affected by construction activities, should ground disturbing activities be conducted within Staging Areas 1 and 2 and along the access roads leading to Staging Areas 2 and 3, an on-site paleontological monitor should also be present in as these areas that have the potential to contain significant paleontological resources.

2.3.5 Construction Scenario

Installation of the proposed project / proposed action would require approximately 11 months to complete. Work efforts would be divided into the following tasks: (1) construction of the temporary access route and staging areas; (2) bale placement, seedling planting, and watering; and (3) proposed project / proposed action oversight and monitoring, with supplemental watering and planting as required. Following the completion of the proposed project / proposed action, the areas of disturbance, including the staging areas and temporary access route, would be restored to their original condition.

2.4 AREA OF POTENTIAL EFFECT

The 323.2-acre APE addressed in this Cultural Resources Technical Report consists of areas of direct effect associated with the construction, operation, and maintenance of the proposed project / proposed action and all proposed alternatives plus a 100-foot buffer around the areas of direct ground disturbance that will account for indirect effects such as dust, foot traffic, and so forth (Figure 2.3.3-1).

SECTION 3.0
REGULATORY FRAMEWORK

This section identifies the federal statutes, ordinances, or policies that govern the conservation and protection of cultural resources that must be considered during the decision-making process for projects that have the potential to affect cultural resources. Land use decisions made by the BLM are governed by several statutes and regulations, most importantly the Federal Land Policy and Management Act of 1976 (FLPMA; 43 U.S.C. 1701 et seq.), regulations in 43 CFR 1600 et seq., NEPA, and regulations established by the Council on Environmental Quality (40 CFR 1500–1508).[1] The BLM has developed manuals and handbooks, most recently the Land Use Planning Handbook, BLM Handbook H-1601-1, that provide guidance for land use plans and decisions.[2]

3.1 FEDERAL

3.1.1 National Historic Preservation Act of 1966[3]

Enacted in 1966 and amended most recently in 2006, the NHPA declared a national policy of historic preservation and instituted a multifaceted program, administered by the Secretary of the Interior, to encourage the achievement of preservation goals at the federal, state, and local levels. The NHPA authorized the expansion and maintenance of the NRHP, established the position of State Historic Preservation Officer (SHPO) and provided for the designation of State Review Boards, set up a mechanism to certify local governments to carry out the purposes of the NHRA, assisted Native American tribes to preserve their cultural heritage, and created the Advisory Council on Historic Preservation (ACHP). Its implementing regulations, 36 CFR 800, are described below as Section 106.

Section 106

Section 106 of the NHPA requires that federal agencies with direct or indirect jurisdiction over federally funded, assisted, or licensed undertakings "take into account the effects of their undertakings on historic properties" (i.e., any property that is included in, or eligible for inclusion in, the NRHP; see below).[4] The ACHP may choose to participate in the Section 106 process if the undertaking would have substantial impacts on important historic properties, presents important questions of policy or interpretation, has the potential for presenting procedural problems, or presents issues of concern to Native American tribes.[5] The Section 106 process involves establishing if the proposed action constitutes an undertaking; identification of historic properties within an APE; determination if the undertaking will cause an adverse effect on historic resources; and resolution of those adverse effects through consultation, avoidance, proposed action redesign, and the execution of a Memorandum of Agreement or Programmatic Agreement.

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[1] USDI Bureau of Land Management. 11 March 2005. *Land Use Planning Handbook BLM Handbook H-1601-1*. Introduction, p. 1. Available at: http://www.blm.gov/nhp/200/wo210/landuse_hb.pdf

[2] USDI Bureau of Land Management. 11 March 2005. *Land Use Planning Handbook BLM Handbook H-1601-1*. Available at: http://www.blm.gov/nhp/200/wo210/landuse_hb.pdf

[3] *United States Code*, 16 USC 470.

[4] 36 CFR Part 800.1(a)

[5] Appendix A to 36 CFR Part 800

In addition to the ACHP, the California Office of Historic Preservation (SHPO), federally recognized Native American Tribes, and applicants for federal permits/leases/funds participate in the process with the federal agency. Other interested members of the public—including individuals, organizations, and state-recognized Native American Tribes—are provided with opportunities to participate in the process. It should be noted that the Section 106 process has been streamlined for undertakings under the statutory or regulatory authority of the California BLM. Section 106 compliance for the proposed action follows the process outlined in the *State Protocol Agreement among the California State Director of the Bureau of Land Management and the California State Historic Preservation Officer and the Nevada State Historic Preservation Officer*,[6] which was executed in 2007 and revised in 2012, BLM is authorized to act on the SHPO's behalf on undertakings that culminate in "no historic properties affected" (36 CFR 800.4(d)(1)) and "no adverse effect" findings (36 CFR 800.5(b)).

National Register of Historic Places

The NRHP was established by the NHPA of 1966 as:

> an authoritative guide to be used by federal, state, and local governments, private groups, and citizens to identify the Nation's cultural resources and to indicate what properties (sites, districts, objects, buildings, and structures) should be considered for protection from destruction or impairment.[7]

The NRHP recognizes properties that are significant at the national, state, and local levels. The register was established and is maintained by the Secretary of the Interior. To be eligible for listing in the NRHP, a resource must be significant in American history, architecture, archaeology, engineering, or culture. Districts, sites, buildings, structures, and objects of potential significance must also possess integrity of location, design, setting, materials, workmanship, feeling, and association. Anyone can recommend a historic property for listing to the National Register, but it is the federal agency responsible for an undertaking that makes the determination of eligibility. A property is eligible for the NRHP if it meets one or more of the following criteria and possesses integrity of location, design, setting, materials, workmanship, feeling, and association:[8]

Criterion A: It is associated with events that have made a significant contribution to the broad patterns of our history.

Criterion B: It is associated with the lives of persons who are significant in our past.

Criterion C: It embodies the distinctive characteristics of a type, period, or method of construction; represents the work of a master; possesses high artistic values; or represents a significant and distinguishable entity whose components may lack individual distinction.

Criterion D: It has yielded, or may be likely to yield, information important in prehistory or history.

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[6] USDI Bureau of Land Management. 2012 *State Protocol Agreement among the California State Director of the Bureau of Land Management and the California State Historic Preservation Officer and the Nevada State Historic Preservation Officer Regarding the Manner in which the Bureau of Land Management will meet its Responsibilities under the National Historic Preservation Act and the National Programmatic Agreement among the BLM, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers.* Agreement Document on file, California State Office, Bureau of Land Management, Sacramento, California.

[7] *Code of Federal Regulations*, 36 CFR 60.2.

[8] *Code of Federal Regulations*, 36 CFR 60.4.

Cemeteries, birthplaces, or graves of historic figures; properties owned by religious institutions or used for religious purposes; structures that have been moved from their original locations; reconstructed historic buildings; and properties that are primarily commemorative in nature are not considered eligible for the NRHP unless they satisfy certain conditions. In general, a resource must be at least 50 years old to be considered for the NRHP, unless it satisfies a standard of exceptional importance.[9]

3.1.2 National Environmental Policy Act

The NEPA requires federal agencies to consider and report the potential environmental impacts of proposed federal actions. Actions likely to have major effects on the environment require the sponsoring agency to develop an Environmental Impact Statement that considers the environmental consequences of alternative proposed action designs; actions likely to have minor effects require Environmental Assessments. "Environment" is defined broadly, and includes cultural resources, social values, and various aspects of the natural environment. Compliance with Section 106 of the NHPA is interlinked with NEPA compliance with respect to historic properties (i.e., historic structures, archaeological sites, traditional cultural properties). The BLM's regulations regarding NEPA are set forth in the National Environmental Policy Act BLM Handbook H-1790-1.[10] Treatment of cultural resources by the BLM is detailed in its Manual Series 8100, et seq.[11]

3.1.3 Native American Graves Protection and Repatriation Act of 1990

The Native American Graves Protection and Repatriation Act of 1990 sets provisions for the intentional removal and inadvertent discovery of human remains and other cultural items from federal and tribal lands. It clarifies the ownership of human remains and sets forth a process for repatriation of human remains and associated funerary objects and sacred religious objects to the Native American groups claiming to be lineal descendants or culturally affiliated with the remains or objects. It requires any federally funded institution housing Native American remains or artifacts to compile an inventory of all cultural items within the museum or with its agency and to provide a summary to any Native American Tribe claiming affiliation.

3.1.4 American Indian Religious Freedom Act

The American Indian Religious Freedom Act (AIRFA) of 1978 was enacted to protect and preserve the traditional religious rights and cultural practices of Native Americans. These rights include, but are not limited to, access of sacred sites, freedom to worship through ceremonial and traditional rights and use, and possession of objects considered sacred. The AIFRA requires that federal agencies evaluate their actions and policies to determine if changes are needed to ensure that Native American religious rights and practices are not disrupted by agency practices. Such evaluations are made in consultation with native traditional religious leaders.

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[9] U.S. Department of the Interior, National Park Service. 2002. *How to Apply the National Register Criteria for Evaluation*. National Register Bulletin 15. Washington, DC.

[10] Bureau of Land Management. 25 October 1988. *National Environmental Policy Act BLM Handbook H-1790-1*. Available at: http://www.blm.gov/nhp/efoia/wo/handbook/h1790-1.pdf

[11] Bureau of Land Management. 3 December 2004. *Manual Series 8100*. Available at: www.blm.gov

3.1.5 Executive Order 13007 (Indian Sacred Sites)

In managing federal lands, agencies shall, to the extent practicable, permitted by law, and not inconsistent with agency functions, accommodate Indian religious practitioners' access to and ceremonial use of Indian sacred sites. Agencies are to avoid adversely affecting the physical integrity of these sites, maintaining the confidentiality of such sites, and informing tribes of any proposed actions that could restrict access to, ceremonial use of, or adversely affect the physical integrity of, sacred sites.

3.1.6 Federal Land Policy and Management Act of 1976

Legislation establishes public land policy and guidelines for the administration, management, protection, development, and enhancement of public lands. Regulations under FLPMA (43 USC 1701 et seq.) established the procedures that the BLM follows in managing public lands. These lands are to be managed in a manner that protects the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archaeological values that, where appropriate, will preserve and protect certain public lands in their natural conditions, provide food and habitat for fish and wildlife and domestic animals, and provide for outdoor recreation and human occupancy and use by encouraging collaboration and public participation throughout the planning process.

3.2 STATE

3.2.1 California Environmental Quality Act

Pursuant to the California Environmental Quality Act (CEQA), a historical resource is a resource listed in, or eligible for listing in, the California Register of Historical Resources (CRHR; Public Resources Code [PRC], Sections 21083.2 and 21084.1).[12,13] In addition, resources included in a local register of historical resources or identified as significant in a local survey conducted in accordance with state guidelines are also considered historical resources under CEQA unless a preponderance of facts demonstrates otherwise. According to CEQA, the fact that a resource is not listed in or determined eligible for listing in the CRHR or is not included in a local register or survey shall not preclude a Lead Agency, as defined by CEQA, from determining that the resource may be a historical resource as defined in California PRC Section 5024.1.

CEQA applies to archaeological resources when (1) the archaeological resource satisfies the definition of a historical resource or (2) the archaeological resource satisfies the definition of a unique archaeological resource. A unique archaeological resource is an archaeological artifact, object, or site that has a high probability of meeting any of the following criteria (PRC Section 21083.2[g])[14]:

(1) The archaeological resource contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information.

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[12] *California Public Resources Code*, Division 13, Section 21083.2.

[13] *California Public Resources Code*, Division 13, Section 21084.1.

[14] *California Public Resources Code*, Division 13, Section 21083.2.

(2) The archaeological resource has a special and particular quality such as being the oldest of its type or the best available example of its type.

(3) The archaeological resource is directly associated with a scientifically recognized important prehistoric or historic event or person.

3.2.2 California Register of Historical Resources

Created in 1992 and implemented in 1998, the CRHR is an authoritative guide in California to be used by state and local agencies, private groups, and citizens to identify the state's historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change (PRC Section 5024.1[a]).[15] Certain properties, including those listed in or formally determined eligible for listing in the NRHP and California Historical Landmarks (CHLs) numbered 770 and higher, are automatically included in the CRHR. Other properties recognized under the California Points of Historical Interest program, identified as significant in historical resources surveys, or designated by local landmarks programs may be nominated for inclusion in the CRHR. A resource, either an individual property or a contributor to a historic district, may be listed in the CRHR if the State Historical Resources Commission determines that it meets one or more of the following criteria, which are modeled on NRHP criteria (PRC Section 5024.1[c]):[16]

Criterion 1: It is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.

Criterion 2: It is associated with the lives of persons important in our past.

Criterion 3: It embodies the distinctive characteristics of a type, period, region, or method of construction; represents the work of an important creative individual; or possesses high artistic values.

Criterion 4: It has yielded, or may be likely to yield, information important in history or prehistory.

Resources nominated to the CRHR must retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance.[17] It is possible that a resource whose integrity does not satisfy NRHP criteria may still be eligible for listing in the CRHR. A resource that has lost its historic character or appearance may still have sufficient integrity for the CRHR if, under Criterion 4, it maintains the potential to yield significant scientific or historical information or specific data.[18] Resources that have achieved significance within the past 50 years may be also eligible for inclusion in the CRHR provided that enough time

[15] *California Public Resources Code*, Section 5024.1.

[16] *California Public Resources Code*, Section 5024.1.

[17] Office of Historic Preservation. 14 March 2006. "Technical Assistance Bulletin 6: California Register and National Register, A Comparison (for Purposes of Determining Eligibility for the California Register)." Available at: http://www.ohp.parks.ca.gov

[18] Office of Historic Preservation. 4 September 2002. "Technical Assistance Series #3, California Register of Historical Resources: Questions and Answers." Available at: http://www.ohp.parks.ca.gov

has lapsed to obtain a scholarly perspective on the events or individuals associated with the resource.[19]

3.2.3 Other State Statutes and Regulations

Native American Heritage Commission

Section 5097.91 of the PRC established the NAHC, whose duties include the inventory of places of religious or social significance to Native Americans and the identification of known graves and cemeteries of Native Americans on private lands. Section 5097.98 of the PRC specifies a protocol to be followed when the NAHC receives notification of a discovery of Native American human remains from a county coroner.

Government Code Sections 6254(r) and 6254.10

These sections of the California Public Records Act were enacted to protect archaeological sites from unauthorized excavation, looting, or vandalism. Section 6254(r) explicitly authorizes public agencies to withhold information from the public relating to "Native American graves, cemeteries, and sacred places maintained by the Native American Heritage Commission." Section 6254.10 specifically exempts from disclosure requests for "records that relate to archaeological site information and reports maintained by, or in the possession of, the Department of Parks and Recreation, the State Historical Resources Commission, the State Lands Commission, the Native American Heritage Commission, another state agency, or a local agency, including the records that the agency obtains through a consultation process between a Native American tribe and a state or local agency."

Health and Safety Code, Sections 7050 and 7052

Health and Safety Code, Section 7050.5 declares that in the event of the discovery of human remains outside of a dedicated cemetery, all ground disturbance must cease and the county coroner must be notified. Section 7052 establishes a felony penalty for mutilating, disinterring, or otherwise disturbing human remains, except by relatives.

Penal Code, Section 622.5

Penal Code, Section 622.5 provides misdemeanor penalties for injuring or destroying objects of historic or archaeological interest located on public or private lands but specifically excludes the landowner.

Public Resources Code, Section 5097.5

Public Resources Code, Section 5097.5 defines a misdemeanor as the unauthorized disturbance or removal of archaeological, historic, or paleontological resources located on public lands.

[19] Office of Historic Preservation. 14 March 2006. "Technical Assistance Bulletin 6: California Register and National Register, A Comparison (for Purposes of Determining Eligibility for the California Register)." Available at: http://www.ohp.parks.ca.gov

3.3 LOCAL

3.3.1 County of Inyo General Plan

The Land Use, Conservation, and Open Space Elements of the Inyo County General Plan set forth the following goal in relation to cultural resources: "Preserve and promote the historic and prehistoric cultural heritage of the County."[20] They include the following policies related to the preservation and promotion of Inyo County's cultural heritage that have relevance to the proposed action:

> *Policy CUL-1.3, Protection of Cultural Resources:* Preserve and protect key resources that have contributed to the social, political, and economic history and prehistory of the area, unless overriding considerations are warranted.
>
> *Policy CUL-1.4, Regulatory Compliance:* Development and/or demolition shall be reviewed in accordance with the requirements of CEQA and the National Historic Preservation Act.

[20] Inyo County Planning Department. December 2001. *Inyo County General Plan*. Independence, CA.

SECTION 4.0 METHODS

This section of the Cultural Resources Technical Report describes the methods employed in the characterization and evaluation of cultural resources at the proposed project / proposed action area. The study methods follow standards outlined in BLM Manual Sections 8110.21A and 8110.B4 for Class I inventories and Class III surveys, respectively; these work efforts were designed to provide the substantial evidence required to evaluate the potential impacts of the proposed action on historic properties. In accordance with CEQA and NEPA, the analysis of cultural resources in the proposed project / proposed action area encompasses paleontological and archaeological resources, historical buildings and structures, human remains, and Native American sacred sites.

4.1 PALEONTOLOGICAL RESOURCES

4.1.1 Record Search and Literature Review

In order to assess the potential presence of recorded paleontological sites and other unique geologic units within the approximately 870-acre (1.4-square-mile) proposed project / proposed action area and surrounding vicinity, record searches were requested from the Natural History Museum of Los Angeles County[1] and the San Bernardino County Museum.[2] Sapphos Environmental, Inc. also examined the results of previous paleontological investigations[3,4] conducted in the vicinity of Keeler Dunes as part of the 2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Environmental Impact Report (EIR)[5] and 2008 Subsequent Environmental Impact Report (SEIR),[6] respectively. Data from the records search and literature review were then compared to a detailed geomorphic map of the Keeler Dunes locale in order to evaluate the potential for the geologic units that characterize the proposed project / proposed action area to yield unique paleontological resources.[7]

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[1] McLeod, Samuel, Natural History Museum of Los Angeles County, Los Angeles, CA. 11 October 2011. Letter response to Clarus Backes, Sapphos Environmental, Inc., Pasadena, CA.

[2] Scott, Eric, San Bernardino County Museum, Redlands, CA. 28 February 2012. Letter response to Tiffany Clark, Sapphos Environmental, Inc., Pasadena, CA.

[3] Gust, S. May 2003. *Paleontological Assessment Report and Mitigation Plan for the Owens Valley Project, Inyo County, California*. Prepared for: Sapphos Environmental, Inc., Pasadena, CA. Prepared by: Cogstone Resource Management, Inc., Santa Ana, CA.

[4] Gust, S., and K. Scott. Revised July 2007. *Paleontological Evaluation of 2008 Supplemental Control Requirements for the Owens Valley PM10 Planning Area Demonstration of Attainment State Implementation Plan, Inyo County, California*. Submitted to: Sapphos Environmental, Inc., Pasadena, CA. Prepared by: Cogstone Research Management, Santa Ana, CA.

[5] Great Basin Unified Air Pollution Control District. February 2004. *2003 Owens Valley PM10 Planning Area Demonstration of Attainment State Implementation Plan Integrated Environmental Impact Report*. State Clearinghouse House Number 2002111020. Prepared by: Sapphos Environmental, Inc., Pasadena, CA. Bishop, CA.

[6] Sapphos Environmental, Inc. 2008. *2008 Owens Valley PM10 Planning Area Demonstration of Attainment State Implementation Plan Final Subsequent Environmental Impact Report, Cultural Resources Technical Report*. Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA. Pasadena, CA.

[7] Bacon, S., and N. Lancaster. 2012. *Geomorphic Map of Keeler Dunes Area*. Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA. Prepared by: Division of Earth and Ecosystem Sciences, Desert Research Institute, Reno, NV.

The areas within the proposed project / proposed action area were evaluated for paleontological resources using the BLM's Potential Fossil Yield Classification System (PFYC).[8] In the PFYC system, geologic units are classified based on the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils and their sensitivity to adverse impacts, with a higher class number indicating a higher sensitivity. This classification is applied to the geologic formation, member, or other distinguishable unit, preferably at the most detailed level that can be mapped. The PFYC system is meant to provide baseline guidance for predicting, assessing, and mitigating paleontological resources. Descriptions of the five classes that compose the PFYC system are provided below:

Class 1—Very Low. Geologic units not likely to contain recognizable fossil remains.

- Units that are igneous or metamorphic, excluding reworked volcanic ash units
- Units that are Precambrian in age or older

Management concern for paleontological resources in Class 1 units is usually negligible or not applicable given that the probability for impacting any fossils is nonexistent or extremely low. As such, assessment or mitigation of paleontological resources is usually unnecessary except in very rare or isolated circumstances.

Class 2—Low. Sedimentary geologic units that are not likely to contain vertebrate fossils or scientifically significant nonvertebrate fossils.

- Vertebrate or significant invertebrate or plant fossils not present or very rare
- Units that are generally younger than 10,000 years before present
- Recent aeolian deposits
- Sediments that exhibit significant physical and chemical changes (i.e., diagenetic alteration)

Management concern for paleontological resources is generally low given that the probability for impacting vertebrate fossils or scientifically significant invertebrate or plant fossils is low. Assessment or mitigation is usually unnecessary except in rare or isolated circumstances. Localities containing important resources may exist, but would be rare and would not influence the classification. These important localities would be managed on a case-by-case basis.

Class 3—Moderate or **Unknown.** Fossiliferous sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence; or sedimentary units of unknown fossil potential.

- Often marine in origin with sporadic known occurrences of vertebrate fossils
- Vertebrate fossils and scientifically significant invertebrate or plant fossils known to occur intermittently; predictability known to be low
- Poorly studied and/or poorly documented. Potential yield cannot be assigned without ground reconnaissance

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[8] Bureau of Land Management. 2008–2009. *Guidelines for Determining Paleontological Significance*. Available at: http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/im_attachments/2008.Par.69083.File.dat/IM2008-009_att1.pdf.

Class 3a—Moderate Potential. Units are known to contain vertebrate fossils or scientifically significant invertebrate fossils, but these occurrences are widely scattered. The potential for a project to be sited on or impact a significant fossil locality is low, but is somewhat higher for common fossils.

Class 3b—Unknown Potential. Units exhibit geologic features and preservational conditions that suggest significant fossils could be present, but little information about the paleontological resources of the unit or the area is known. This may indicate the unit or area is poorly studied, and field surveys may uncover significant finds. The units in this class may eventually be placed in another class when sufficient survey and research is performed. The unknown potential of the units in this class should be carefully considered when developing any mitigation or management actions.

Management concern for paleontological resources is moderate; or cannot be determined from existing data. Surface-disturbing activities may require field assessment to determine appropriate course of action.

This category includes a broad range of paleontological potential. It includes geologic units of unknown potential, as well as units of moderate or infrequent occurrence of significant fossils. Management considerations cover a broad range of options as well, and could include field surveys, monitoring, or avoidance. Surface-disturbing activities will require sufficient assessment to determine whether significant paleontological resources occur in the area of a proposed action, and whether the action could affect the paleontological resources.

Class 4—High. Geologic units that contain a high occurrence of significant fossils. Vertebrate fossils or scientifically significant invertebrate or plant fossils are known to occur and have been documented, but may vary in occurrence and predictability. Surface disturbing activities may adversely affect paleontological resources in many cases.

Class 4a—Unit is exposed with little or no soil or vegetative cover. Outcrop areas are extensive, with exposed bedrock areas often larger than 2 acres. Paleontological resources may be susceptible to adverse impacts from surface disturbing actions.

Class 4b—These are areas underlain by geologic units with high potential but that have lowered risks of human-caused adverse impacts and/or lowered risk of natural degradation due to moderating circumstances. The bedrock unit has high potential, but a protective layer of soil, thin alluvial material, or other conditions may lessen or prevent potential impacts to the bedrock resulting from the activity.

- Extensive soil or vegetative cover; bedrock exposures are limited or not expected to be impacted
- Areas of exposed outcrop are smaller than 2 contiguous acres
- Outcrops form cliffs of sufficient height and slope so that impacts are minimized by topographic conditions
- Other characteristics are present that lower the vulnerability of both known and unidentified paleontological resources

Management concern for paleontological resources in Class 4 is moderate to high, depending on the proposed action. A field survey by a qualified paleontologist may be needed to assess local conditions. The probability for impacting significant paleontological resources is moderate to high, and is dependent on the proposed action. Mitigation considerations must include assessment of the disturbance, such as removal or penetration of protective surface alluvium or soils and potential for future accelerated erosion. If impacts to significant fossils can be anticipated, on-the-ground surveys prior to authorizing the surface disturbing action will usually be necessary. On-site monitoring or spot-checking may be necessary during construction activities.

Class 5—Very High. Highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils, and that are at risk of human-caused adverse impacts or natural degradation.

Class 5a—Unit is exposed with little or no soil or vegetative cover. Outcrop areas are extensive with exposed bedrock areas often larger than 2 contiguous acres. Paleontological resources are highly susceptible to adverse impacts from surface disturbing actions. Unit is frequently the focus of illegal collecting activities.

Class 5b—These are areas underlain by geologic units with very high potential but that have lowered risks of human-caused adverse impacts and/or lowered risk of natural degradation due to moderating circumstances. The bedrock unit has very high potential, but a protective layer of soil, thin alluvial material, or other conditions may lessen or prevent potential impacts to the bedrock resulting from the activity.

- Extensive soil or vegetative cover; bedrock exposures are limited or not expected to be impacted
- Areas of exposed outcrop are smaller than 2 contiguous acres
- Outcrops form cliffs of sufficient height and slope so that impacts are minimized by topographic conditions
- Other characteristics are present that lower the vulnerability of both known and unidentified paleontological resources

Management concern for paleontological resources in Class 5 areas is high to very high. A field survey by a qualified paleontologist is usually necessary prior to surface disturbing activities or land tenure adjustments. Mitigation will often be necessary before and/or during these actions. The probability for impacting significant fossils is high. Vertebrate fossils or scientifically significant invertebrate fossils are known or can reasonably be expected to occur in the impacted area. On-the-ground surveys prior to authorizing any surface disturbing activities will usually be necessary. On-site monitoring may be necessary during construction activities.

4.1.2 Paleontological Field Survey

As discussed in Section 5.2.2, *Paleontological Resources Characterization*, information obtained from the paleontological records searches indicate that the western extent of the proposed project / proposed action area contains geological units with a high potential of paleontological resources. As a result of this finding, a paleontological field survey was conducted for portions of the three staging areas and access routes within the APE; these portions of the APE will be subjected to minor grading, vegetation flattening, and/or vegetation removal, and therefore have the greatest potential to be impacted during the implementation of the proposed project / proposed action (see Section 2.0, *Project Description*). The field work was completed in accordance with the methodology outlined in the BLM's Instructional Memorandum (IM) 2008-009, Manual H-8720-1, and IM 2009-011.[9] Fieldwork was undertaken on July 23, 2013, by Wayne A. Thompson, PhD, of SWCA Environmental Consultants (BLM Permit CA-12-00-007P). A supplemental paleontological survey in support of alternative access alignments to the staging areas was undertaken on February 20, 2014, by Michael Williams, PhD, of Sapphos Environmental, Inc. under the direction of Mr. Greg Haverstock (BLM Archaeologist).

4.2 PREHISTORIC AND HISTORIC RESOURCES

4.2.1 Record Search and Literature Review

A literature review was undertaken to determine if previously documented cultural resources are present within a portion of the Keeler Dunes locale that has been identified for the implementation of DCMs. An archaeological records search was conducted in September 2011 at the EIC, University of California, Riverside, to obtain information about previous archaeological work and known cultural resources within the proposed project / proposed action area or within a 1-mile radius. In addition, the California State Historical Resources Inventory, the NRHP, the listing of CHLs, and the California Points of Historical Interest were searched during the EIC visit to ascertain the presence of potential historic resources within the proposed project / proposed action area. Finally, a search of the site files housed at the BLM Bishop Field Office was completed by Mr. Greg Haverstock (BLM Archaeologist), who provided Sapphos Environmental, Inc. with information on the cultural resources in the project / proposed action area that are located on BLM land.

4.2.2 Class III Survey and Site Recordation

A limited Class III (intensive) survey was conducted on three of the four proposed temporary staging areas and access routes located on BLM and LADWP land (Figure 4.2.2-1, *Class III Survey Area*). These portions of the APE were selected for the intensive pedestrian survey as they will be subjected to minor grading, vegetation flattening, and/or vegetation removal, and therefore have the greatest potential to be impacted during the implementation of the proposed project / proposed action (see Section 2.0, *Project Description*). The purpose of the Class III survey was to examine the locations of the three temporary staging areas, access routes, and a 100-foot buffer around those elements to ensure that no potentially significant cultural resources would be affected during construction. Fieldwork authorization was obtained by BLM prior to the initiation of fieldwork (CA Cultural Use Permit Number CA-10-37) or was directly supervised by Mr. Greg Haverstock (BLM Archaeologist).

The Class III survey was conducted in two periods. The first was performed by Mr. Adam White on July 23 and 24, 2013. During this first survey, Mr. White observed sparse scatters of obsidian debitage in the proposed location of the northernmost staging area within the APE and the proposed access route to the middle staging area within the APE, and observed a few isolated bone fragments at the southeastern end of the northwest-southeast access route. To ensure avoidance of these resources, Mr. White surveyed alternatives to the northernmost and central staging areas within the APE and access routes, and surveyed an alternative to the southeastern portion of the northwest-southeast access route (Figure 4.2.2-1).

A second survey was conducted on February 20, 2014, and was performed by Ms. Rachael Nixon and Mr. Karl Holland under the direction of Mr. Greg Haverstock (BLM Archaeologist). Seventeen

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[9] SWCA Environmental Consultants. 2013. *Paleontological Survey Report for the Keeler Dunes Project, Owens Lake, Inyo County, California*. Report prepared for Sapphos Environmental, Inc., Pasadena, California.

archaeological isolates and one site were observed within the APE. Mr. Greg Haverstock recorded all resources and a brief summary of findings are provided in Table 4.2.2-1, *Archaeological Resources Recorded by BLM during February 20, 2014, Class III Survey*). The State of California Department of Parks and Recreation (DPR) 523-series forms are on file with the BLM Bishop Field Office.

TABLE 4.2.2-1
ARCHAEOLOGICAL RESOURCES RECORDED BY BLM DURING FEBRUARY 20, 2014, CLASS III SURVEY

Resource ID	Period	Description	Measurements
BLM-SITE-1	Prehistoric	Lithic scatter	3 meter diameter
BLM-ISO-1	Historic	Brown colored, thick walled, mold blown bottle	—
BLM-ISO-2	Historic	2 fragments of broken ceramic electrical insulator	—
BLM-ISO-3	Historic	Metal fragments, log bolt, large bolt	—
BLM-ISO-4	Historic	Sheet metal	4.5x18 inches
BLM-ISO-5	Historic	Steel pipe, 6 fragments,	2 inch diameter
BLM-ISO-6	Historic	2 fragments of broken ceramic electrical insulator	—
BLM-ISO-7	Historic	Steel sheet with bolt holes and opening, riveted	5 inches thick
BLM-ISO-8	Historic	Steel wire, 2 gauges, fragments, 9 segments	—
BLM-ISO-9	Historic	Ceramic electrical insulator fragments	—
BLM-ISO-10	Historic	Telephone pole cross member with insulated post	51″ wooden member, 17″ post, 1/2″ bolt
BLM-ISO-11	Historic	Karo syrup bottle fragment, clear glass (1968–present)	—
BLM-ISO-12	Historic	Gallon and 1/2 gallon wine jugs clear glass	—
BLM-ISO-13	Historic	Solarized brown Clorox bottle neck and rim (1958–present), and glass ketchup bottle, octagonal with solarized clear glass	—
BLM-ISO-14	Historic	Brown Duraglas been bottle(1947)	—
BLM-ISO-15	Historic	Brown Duraglas been bottle(1941)	—
BLM-ISO-16	Historic	Wire sand fence (8 strands)	—
BLM-ISO-17	Prehistoric	Elongated rock cairn	170 x 67 cm

During the 2012 surveys and at the direction of BLM (Mr. Greg Haverstock), Sapphos Environmental, Inc. recorded three archaeological sites in support of the proposed project / proposed action. One was a multicomponent site that was recently discovered by Mr. Haverstock during a visit to the Keeler Dunes area. The two other sites include a section of the Old State Highway and a previously unrecorded section of the Carson & Colorado Railroad line (P-14-7851/CA-INY-6513H), both of which are situated in the southwestern extent of the proposed project / proposed action area. Sapphos Environmental, Inc. formally document the archaeological remains and evaluate the sites for inclusion on the NRHP and CRHR. The site recordation was completed by Dr. Tiffany Clark and Mr. Adam White on September 25 and 26, 2012.

The ground surface in the area of three sites was thoroughly examined by the archaeologists, who used pin flags to mark the locations of identified features and artifacts. Once the extent and nature

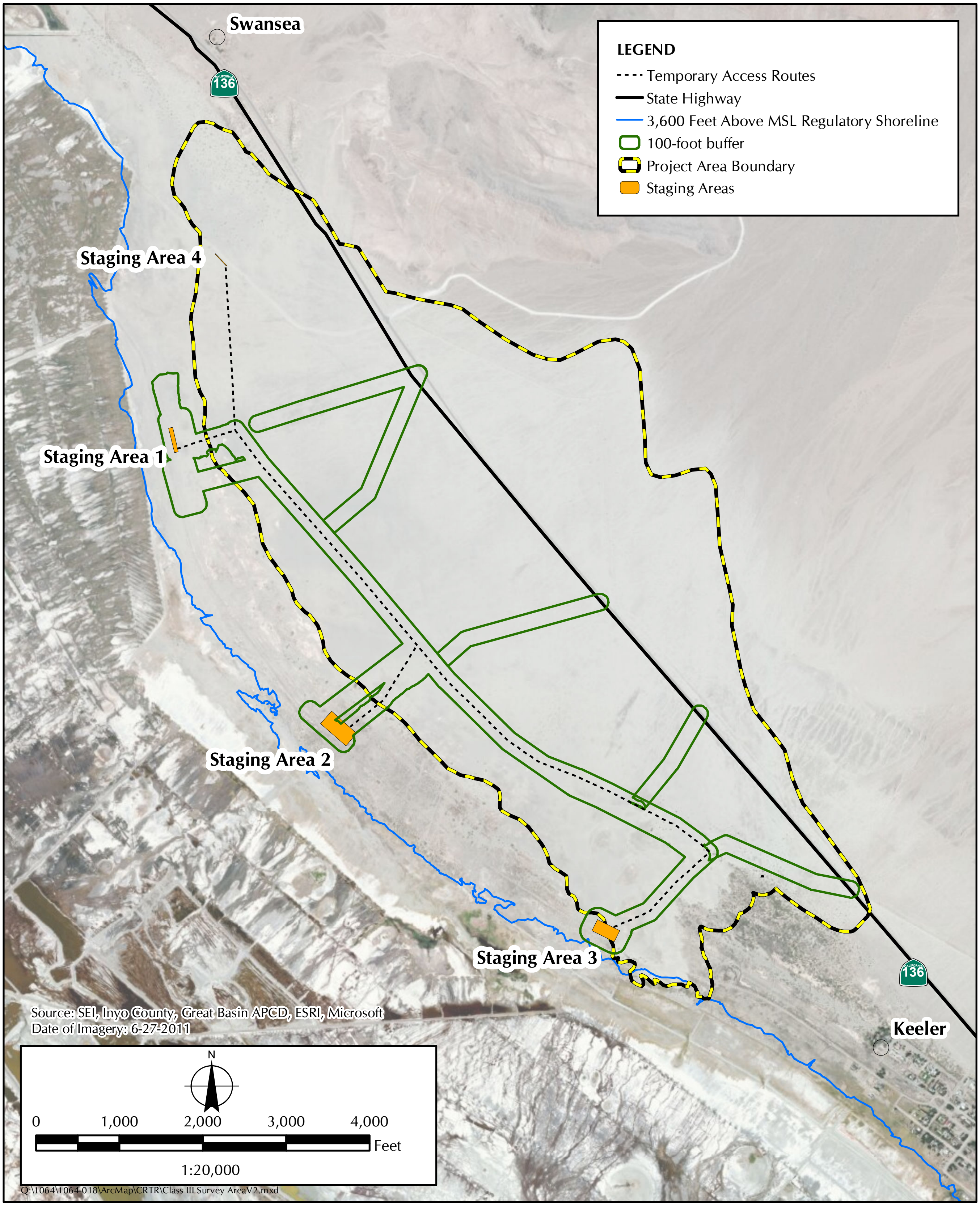

FIGURE 4.3.2-1

Class III Survey Area

of the cultural deposits were defined, the sites were recorded on DPR 523-series site record forms. Field mapping of sites was primarily conducted with global positioning system (GPS) units; field sketch maps and photographs provided necessary supplemental documentation. The locations of the sites were subsequently mapped on the appropriate USGS topographic quadrangle using post-processed GPS data with elevations determined from USGS maps. No artifacts were collected during the site recordation.

4.2.3 Agency Consultation

Sapphos Environmental, Inc. coordinated with the BLM Archaeologist at the onset of the proposed project / proposed action to delineate the appropriate scope of work needed to assess cultural resources and to define the APE. Initial consultation with Mr. Haverstock determined that a Class III (intensive pedestrian) survey of the entire proposed project / proposed action area was not warranted as a number of surveys had been completed in the general vicinity, and cultural resources were well-documented in the Keeler Dunes area.[10] It was later decided that a Class III survey of the portions of the APE that include three of the four staging areas and access routes be examined as these areas are expected to experience minor mechanical ground disturbance (i.e., minor grading, vegetation flattening or removal). Throughout the current phase of project / proposed action planning, coordination with the BLM was maintained in the form of emails, meetings, and phone conversations with Mr. Haverstock, who provided Sapphos Environmental, Inc. with current information regarding site conditions and agency expectations.

4.3 NATIVE AMERICAN SACRED SITES AND HUMAN REMAINS

4.3.1 Native American Coordination

Native American coordination was undertaken to fulfill the District's requirements, pursuant to CEQA, for consideration of Native American cultural resources. Records searches for the proposed project / proposed action included a request for a search of the Sacred Lands File maintained by the NAHC. This request was made of the NAHC early in the planning process in August 2011.[11] The results of the search would be an indication of the presence of known Native American cultural resources in the proposed project / proposed action study area. Written responses to the District's inquiry received by Sapphos Environmental, Inc. on August 31, 2011[12] advised that the Sacred Lands File indicated that no Native American cultural resources have been identified within the cultural resources study area (Appendix A, *Documentation of Native American Consultation*). However, the NAHC did indicate that the Keeler Dunes locale is known as a culturally sensitive area and recommended that additional coordination be undertaken with local Native American groups and individuals on the matter. As a result of this recommendation, Sapphos Environmental, Inc., acting on behalf of the District, sent letters to 10 Native American contacts classified by the NAHC as potential sources of information related to cultural resources in the vicinity of the proposed project / proposed action area. The letters advised the tribes and specific individuals of the proposed project / proposed action and its geographic area and requested information regarding cultural resources within the study area, as well as feedback or concerns related to the proposed

[10] Clark, Tiffany, Sapphos Environmental, Inc., Pasadena, CA. 16 March 2011. Contact Report to Greg Haverstock, BLM Bishop Field Office, Bishop, CA.

[11] Backes, Clarus, Sapphos Environmental, Inc., Pasadena CA. 24 August 2011. Letter to Larry Myers, Native American Heritage Commission, Sacramento, CA.

[12] Singleton, Dave, Native American Heritage Commission, Sacramento, CA. 31 August 2011. Letter response to Clarus Backes, Sapphos Environmental, Inc., Pasadena, CA

project / proposed action. This outreach resulted in responses from Matthew Nelson, a Tribal Historic Preservation Officer and NAGPRA Coordinator of the Bishop Paiute Tribe, who noted that the Keeler Dunes and foothills of the Inyo Mountains east of Owens Lake contained extremely culturally sensitive areas.[13] A second response was received from Kathy Fabunan, a tribal administer for the Lone Pine Paiute-Shoshone Tribe, who forwarded the request for information to the tribe's Cultural Committee for comment.[14] Sapphos Environmental, Inc. Native American Coordination efforts was completed at this stage and transferred to BLM, who is responsible for formal Section 106 consultation with the Tribes. Refer to Section 4.3.2, *Native American Consultation* (below), for details regarding the Section 106 consultation process to date.

Although a review of the available historic maps for the area indicate that no formal cemeteries are located within the proposed project / proposed action study area, documentation on file at the EIC and at the BLM Bishop Field Office indicate Native American burials are present in the proposed project / proposed action study area at archaeological site P-14-7841/CA-INY-6502 (originally recorded as P-14-7841/CA-INY-6502 and P-14-7840/CA-INY-6503).

Limited Phase II testing of the rock cairns at CA-INY-6502 identified one feature that was associated with human remains. The results of the archaeological investigation conducted at CA-INY-6502 suggest that the site was used as a prehistoric burial locale and could be part of a larger mortuary complex that lined the prehistoric shore of Owens Lake. See Section 5 *Results* for more details regarding the investigation efforts and results.

4.3.2 Native American Consultation

The BLM is responsible for formal consultation with interested Native American tribes and individuals pursuant to Section 106, consistent with the requirements of NEPA. The Section 106 consultation process was initiated by the BLM in October 2011, and at that time included BLM, SHPO, and Tribal representatives as consulting parties. In November 2013, new irrigation alternatives were identified by the District and discussed with BLM. As a result of these discussions, the BLM reinitiated the Section 106 consultation process (December 2013) to then include the BLM, SHPO, Tribal representatives, and the District. Alternatives 4 and 5 were developed as a result of the second Section 106 consultation efforts. Alternative 4 was added to eliminate the need for water tanks and provide direct delivery of water to the temporary irrigation system. Alternative 5 was added to eliminate water tanks and water trucks, by providing water delivery directly from the Keeler Community Service District well via pipeline. Alternatives 3, 4, and 5 provide for hand watering areas with cultural sensitivity (less 15 percent). Additionally, the proposed project / proposed action description was revised to include Native American participation in vegetation planting within cultural sensitive areas. As part of the Section 106 consultation process, the BLM sent letters and organized meetings and field visits with tribal representatives to discuss the proposed project / proposed action and alternatives to obtain their comments and concerns about the proposed project / proposed action and alternatives. A summary of the tribal consultation efforts undertaken by the BLM is provided in Table 4.3.2-1, *Summary of Native American Consultation Efforts for the Proposed Project / Proposed Action*).

[13] Nelson, Matthew, Tribal Historic Preservation Officer and NAGPRA Coordinator, Bishop Paiute Tribe, Bishop, CA. 8 December 2011. Email response to Clarus Backes, Sapphos Environmental, Inc., Pasadena, CA.

[14] Fabunan, Kathy, Tribal Administer, Lone Pine Paiute-Shoshone Reservation, Lone Pine, CA. 3 October 2011. Email response to Clarus Backes, Sapphos Environmental, Inc., Pasadena, CA.

TABLE 4.3.2-1
SUMMARY OF NATIVE AMERICAN CONSULTATION EFFORTS FOR THE PROPOSED PROJECT / PROPOSED ACTION

Native American Group	Point of Contact	Date	Method of Consultation	Topic of Consultation
Lone Pine	Chair: Joseph	10/24/11	Cert letter	Keeler Dunes—District proposal for dust control
Independence	Chair: Naylor	10/24/11	Cert letter	Keeler Dunes–District proposal for dust control
Big Pine	Chair: Moose	10/24/11	Cert letter	Keeler Dunes—District proposal for dust control
Timbisha	Chair; Gholson	10/18/11	Phone	Keeler Dunes—District proposal for dust control
Timbisha	Chair; Gholson	10/17/11	Letter	Keeler Dunes—District proposal for dust control
Lone Pine	THPO, CR Committee	11/5/2011	Meeting	Keeler Dunes—District proposal for dust control, DRECP
Lone Pine	Acting Chair, Mary Wuester, Kathy Bancroft, THPO	1/20/2012	Meeting and Field Trip to ODL cairns	DRECP, Keeler Dunes—District proposal for dust control
Big Pine	Bill Helmer, THPO; Danielle Gutteriez, T. Sec. The rest of the council did not attend.	2/21/2012	Meeting	Solar PEIS, DRECP, CASSP, Digital 395, Keeler Dunes Test, Owens Lake Planning, Bodie Vegetation Update
Lone Pine	Acting Chair, Mary Wuester, Kathy Bancroft, THPO	2/5/2014	Meeting	Keeler Dunes–District and BLM to discuss the proposed irrigation alternatives
Big Pine	Bill Helmer, THPO, Danelle Gutierrez, Vice Chair, Sally Manning, Environmental Director, Jacklyn Velazquez,	2/11/2014	Meeting	Keeler Dunes–District and BLM to discuss the proposed irrigation alternatives

Key: District = Great Basin Unified Air Pollution Control District

SECTION 5.0
RESULTS

This section of the Cultural Resources Technical Report details the results of the paleontological records search and survey, the archaeological Class I inventory and limited Class III survey, and the recordation of three archaeological sites within the proposed project / proposed action area. A description of the environmental setting of the Owens Valley is first presented, which includes a summary of paleoenvironmental data from the Owens Lake area. This is followed by the findings of the Class I inventory and limited surveys of paleontological, archaeological, and built environment resources within the cultural resources study area, as well as the results of site recordation efforts within the area of potential effect (APE). An assessment of adverse effects of the proposed project / proposed action on identified paleontological and cultural resources is also undertaken to determine if the implementation of Dust Control Measures (DCMs) will adversely affect significant resources in the Keeler Dunes locale.

5.1 ENVIRONMENTAL SETTING

5.1.1 Physical History of Owens Lake

The Owens Valley, located in the southwestern Great Basin, extends for approximately 200 kilometers north-south and has a variable width between 15 and 40 kilometers. The valley is bounded on the west by the Sierra Nevada, on the east by the Inyo Mountains and White Mountains, and on the south by the Coso Range (Figure 2.1-1).

Owens Lake is located at the southernmost portion of Owens Valley, and is part of a chain of lakes that was active about 1.8 million years ago during the Pleistocene. The lake system extended from Mono Lake (previously a much larger lake known as Lake Russell) and continued south to Lake Manly. Mono Lake was the northernmost lake of the system until its level dropped prior to 35,000 years ago. After this time, the Owens Lake continued to be fed by Owens River, and waters from the lake flowed through the Rose Valley and into China Lake to the south. China Lake overflowed into Searles Lake and Panamint Lake, and continued farther south into Lake Manly.

During the Late Pleistocene, Owens Lake was an open-basin lake reaching high stands between approximately 3,756 feet (1,145 meters) and 3,805 feet (1,160 meters) above mean sea level, and a closed-basin lake during the Holocene. Originally thought of as a stable lake, combined studies of core and stratigraphy indicate a high frequency of water level oscillation, which had not been documented in other pluvial lake basins in the western United States.[1,2] As previously stated, Owens Lake was a natural closed basin before its desiccation, and was fed by Owens River on the north, and by smaller streams from the Sierra Nevada, such as Bishop Creek, Cottonwood Creek, and Ash Creek. Other water sources included ephemeral streams from the Inyo and Coso Mountains to the east and south. Several small springs also occur around the shore and within the lake bed. Closed-basin conditions have prevailed throughout most of the lake's history, which

[1] Bacon, S.N., R.M. Burke, S.K. Pezzopane, and A.S. Jayko. 2005. "Last Glacial Maximum and Holocene Lake Levels of Owens Lake, Eastern California, USA." *Quaternary Science Reviews*, 1–19.

[2] Note: As used by the authors, the term pluvial refers here to a "mean climatic regimen of sufficient duration to be represented in the physical or organic record, and in which the precipitation/evaporation ratio results in greater net moisture available for water bodies and organisms than is available in the same area today or in the preceding regimen. See Bacon, S.N., R.M. Burke, S.K. Pezzopane, and A.S. Jayko. 2005. "Last Glacial Maximum and Holocene Lake Levels of Owens Lake, Eastern California, USA." *Quaternary Science Reviews*, 2.

imply that there is no transport of material, either water or sediment, except through evaporation or wind transport.[3]

Paleoenvironmental analyses indicate that Owens Lake has experienced a number of oscillations between approximately 27,000 calibrated years before present (cal yr BP) to the present.[4] These studies indicate a high stand of the lake at approximately 3,805 feet (1,160 meters) between 24,000 and 23,730 cal yr BP followed by a drop in water levels. A first possible desiccation event and/or very low water levels has been suggested based on a hiatus from sediment cores between approximately 18,920 and 15,590 cal yr BP.[5] A lower high stand of approximately 3,756 feet (1,145 meters) was registered between 15,700 and 15,000 cal yr BP.[6] Very shallow lake levels are also suggested by the presence of sediments that indicate subaerial conditions approximately 12,600 cal yr BP, when the lake registered elevations of approximately 3,608 feet (1,100 meters).[7] A second dry interval was recorded shortly after these low levels at approximately 11,200 cal yr BP. This was followed by a high stand that was not previously reported and that dropped quickly leaving shorelines at approximately 3,674 feet (1,120 meters) between 7860 and 7650 cal yr BP.[8] A third event of near-desiccation and shallow water levels was documented between 6500 and 4400 cal yr BP.[9] Lake oscillations continued throughout the Late Holocene, and between 350 and 230 cal yr BP records indicate that the lake dried into a playa.[10]

During historic times, Owens Lake's highest stand reached approximately 3,600 feet in 1872.[11] Water diversion for irrigation purposes in the late 1800s and early 1900s, in addition to dry climatic conditions, continued to lower the lake level, which rose again after the drought was over. The lake began its complete and final desiccation period after 1913, when the Owens River water was diverted to the Los Angeles Aqueduct by the City of Los Angeles Department of Water and Power (LADWP).[12] By the mid-1920s, Owens Lake had become a dry playa, only to receive water on seven occasions due to unusually high runoff, in 1938, 1967, 1969, 1980, 1982, 1983, and 1986.[13]

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[3] Soil and Water West, Inc. 25 September 2001. *Owens Lakebed Survey (Revised)*. Prepared by: Soil and Water West, Inc., P.O. Box 44666, Rio Rancho, NM. Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA.

[4] Bacon, S.N., R.M. Burke, S.K. Pezzopane, and A.S. Jayko. 2005. "Last Glacial Maximum and Holocene Lake Levels of Owens Lake, Eastern California, USA." *Quaternary Science Reviews*, 1–19.

[5] Benson, L., Kashgarian, M., Rye, R., Lund, S., Paillet, F., and Smoot, J. 2002. "Holocene Multidecadal and Multicentennial Droughts Affecting Northern California and Nevada." *Quaternary Science Review*, *21*: 659–682.

[6] Orme, A.R, and A.J. Orme. 1993. "Late Pleistocene Oscillations of Lake Owens, Eastern California." *Geological Society of America Abstracts with Programs*, *25*: 129–130.

[7] Benson, L., Kashgarian, M., Rye, R., Lund, S., Paillet, F., and Smoot, J. 2002. "Holocene Multidecadal and Multicentennial Droughts Affecting Northern California and Nevada." *Quaternary Science Review*, *21*: 659–682.

[8] Bacon, S.N., R.M. Burke, S.K. Pezzopane, and A.S. Jayko. 2005. "Last Glacial Maximum and Holocene Lake Levels of Owens Lake, Eastern California, USA." *Quaternary Science Reviews*, 1–19.

[9] Benson, L., Kashgarian, M., Rye, R., Lund, S., Paillet, F., and Smoot, J. 2002. "Holocene Multidecadal and Multicentennial Droughts Affecting Northern California and Nevada." *Quaternary Science Review*, *21*: 659–682.

[10] Li, H-C., Bischoff, J.L., Ku, T.L., Lund, S.P., and Stott, L.D. 2000. "Climate Variability in East Central California during the Past 1000 Years Reflected by High Resolution Geochemical and Isotopic Records from Owens Lake Sediments." *Quaternary Research*, *54*: 189–197.

[11] Smith, G.I., and Bischoff, J.L., Editors. 1993. "Core O.L. 92 from Owens Lake, Southeast California." U.S. Department of the Interior, U.S. Geological Survey, Open File Report 93-683. Menlo Park, CA.

[12] Smith, G.I., and Bischoff, J.L., Editors. 1993. "Core O.L. 92 from Owens Lake, Southeast California." U.S. Department of the Interior, U.S. Geological Survey, Open File Report 93-683. Menlo Park, CA.

[13] Stine, S. 1994. *Late Holocene Fluctuations of Owens Lake, Inyo County, California*. Prepared for: Far Western Anthropological Research Group, Inc., Davis, CA.

In sum, the history of desiccation at Owens Lake began as a consequence of climatic change, accelerated due to irrigation, and ended as a result of water diversion, resulting into the modern Owens Lake playa.[14]

5.1.1.1 Owens Lake Sediments

Several subenvironments have been described within the lake bed based on their morphological characteristics, sediment composition, groundwater, and location on the playa. Today, two main features, the historic shoreline and the brine pool, are evident in topographic maps and aerial photographs. The historic shoreline is considered to be located at 3,600 feet above mean sea level; while the brine pool is considered to be the lowest portion of the lake, located below approximately 3,553 feet.

Owens Lake has always been an alkaline body of water, and water evaporation has caused salt deposits to accumulate on the surface; these salts also migrate through capillarity from the lake's shallow water table.[15] In addition, minerals develop and change into different types, depending on temperature and the presence of rain,[16,17] resulting in a mosaic of textures on the surface of the lake.

The thickness of lake deposits in the deepest portions of the basin range from 3,000 to over 10,000 feet.[18] Currently, portions of the surface of the Owens Lake playa are characterized by a thin layer of windblown sand mixed with clay and an alkali crust, while the layer immediately beneath the surface does not contain any sand. The crust that forms on the surface curves above the clay, forming a hard layer when it dries. The appearance and consistency of the crust varies throughout the year; during summer time, the upper strata of clay dries, forming polygons with open cracks in between that may reach up to 1 meter in depth.[19]

5.1.1.2 Vegetation

Vegetation communities surrounding the Owens Valley are characteristic of those present in the Great Basin and are associated with the different elevations present in the area. Riparian systems are associated with streams that flow from the Sierra Nevada, such as the Owens River delta in the northern portion of the lake, and near springs. Desert Scrub characterizes the area between 4,000 and 6,500 feet. Pinyon Woodland is present between 6,500 and 8,500 feet, and Upper Sage Brush

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[14] Saint-Amand, P., Gaines, C., and Saint-Amand, D. 1987. "Owens Valley, an Ionic Soap Opera Staged on a Natric Playa." In *Geology of the Owens Valley and Inyo Mountains Region, California*. South Coastal Geological Society, Annual Field Trip Guide Book, No. 20-2001, pp. 113–132.

[15] Soil and Water West, Inc. 25 September 2001. *Owens Lakebed Survey (Revised)*. Prepared by: Soil and Water West, Inc., P.O. Box 44666, Rio Rancho, NM. Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA.

[16] Saint-Amand, P., Gaines, C., and Saint-Amand, D. 1987. "Owens Valley, an Ionic Soap Opera Staged on a Natric Playa." In *Geology of the Owens Valley and Inyo Mountains Region, California*. South Coastal Geological Society, Annual Field Trip Guide Book, No. 20-2001, pp. 113–132.

[17] Sharp, R.P., and Glazner, A.F. 1997. "A Story of Desiccation; Once-Blue Owens Lake." In *Geology Underfoot in Death Valley and Owens Valley*, pp. 185–194. Missoula, MT: Mountain Press Publishing Company.

[18] Soil and Water West, Inc. 25 September 2001. *Owens Lakebed Survey (Revised)*. Prepared by: Soil and Water West, Inc., P.O. Box 44666, Rio Rancho, NM. Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA.

[19] Saint-Amand, P., Gaines, C., and Saint-Amand, D. 1987. "Owens Valley, an Ionic Soap Opera Staged on a Natric Playa." In *Geology of the Owens Valley and Inyo Mountains Region, California*. South Coastal Geological Society, Annual Field Trip Guide Book, No. 20-2001, pp. 113–132.

dominates at higher elevations between approximately 8,500 and 9,500 feet.[20,21] Currently, vegetation in the immediate vicinity of the Owens Lake is dominated by Desert Scrub near the shoreline and occasionally on spring mounds located within the lake bed.

During prehistoric times, the variety of resources present within the valley was attractive to native inhabitants, particularly within those areas in the vicinity of the lake characterized by riparian habitats that supported a large variety of fauna, such as mammals, birds (including waterfowl), and reptiles. Fresh water mussels (*Anadonta* sp.) and brine fly larvae (*Ephydra* sp.) were also present in other areas around the lake. Several plant species were also available and were used as food resources or as materials for basket making.[22,23]

5.1.1.3 Owens Lake Level Fluctuations and Prehistoric Cultural Resources

Prior to investigations in the 1990s associated with dust control, Owens Lake was considered to be a perennial lake that had persisted as such throughout the Holocene. It was assumed that any cultural evidence would be found above the historic shoreline, which is considered to be located at approximately 3,600 feet. However, in 1994, Stine suggested that if the lake had experienced changes in its water levels at times of human occupation in the area, the presence of cultural materials below the historic shoreline would be expected. These then would have been covered by water during historic times.[24]

Following Stine's hypothesis, it is clear that fluctuations in the lake level are significant because they influence the distribution of those environments associated with the lake boundaries. Therefore, the availability of plant and animal resources is also determined by these water levels. As a consequence, human populations would also adjust their foraging rounds based on the location of those resources. For example, waterfowl habitats are known to be associated with salt lakes, and it is known that prehistoric hunters took advantage of this resource. In addition, plant resources located on the north portion of the lake, near the delta, would have also provided a food source.[25]

A reconstruction of lake levels during the Holocene indicates that between 2000 and 1000 cal yr BP, water levels at Owens Lake were very low, and the lake probably was completely dry by 600 cal yr BP.[26] After this dry period, the lake recovered, as did other closed-basin lakes such as Mono, Silver, and Pyramid Lakes.

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[20] Bettinger, R.L.1982c. Archaeology East of the Range of Light: Aboriginal Human Ecology of the Inyo-Mono Region, California. *Monographs in California and Great Basin Anthropology, 1*. Davis, CA.

[21] Basgall, M.E., and K.R. McGuire. 1988. *The Archaeology of CA-INY-30: Prehistoric Culture Change in the Southern Owens Valley, California*. Prepared by: Far Western Anthropological Research Group, Inc., Davis, CA. Prepared for: California Department of Transportation, Bishop, CA.

[22] Bettinger, R.L.1982c. Archaeology East of the Range of Light: Aboriginal Human Ecology of the Inyo-Mono Region, California. *Monographs in California and Great Basin Anthropology, 1*. Davis, CA.

[23] Basgall, M.E., and K.R. McGuire. 1988. *The Archaeology of CA-INY-30: Prehistoric Culture Change in the Southern Owens Valley, California*. Prepared by: Far Western Anthropological Research Group, Inc., Davis, CA. Prepared for: California Department of Transportation, Bishop, CA.

[24] Stine, S. 1994. *Late Holocene Fluctuations of Owens Lake, Inyo County, California*. Prepared for: Far Western Anthropological Research Group, Inc., Davis, CA.

[25] Stine, S. 1994. *Late Holocene Fluctuations of Owens Lake, Inyo County, California*. Prepared for: Far Western Anthropological Research Group, Inc., Davis, CA.

[26] Stine, S. 1994. *Late Holocene Fluctuations of Owens Lake, Inyo County, California*. Prepared for: Far Western Anthropological Research Group, Inc., Davis, CA.

Four different beach lines have been identified below the historic-level shoreline at elevations of approximately 3,504 feet, 3,592 feet, 3,586 feet, and 3,584 feet.[27] The idea that these shorelines could have originated during the 19th and 20th centuries is discarded because the quick diversion of the river would not have allowed the formation of marked shorelines.[28] Although the Owens Valley is a tectonically active zone, and several faults have caused the distortion of preexisting beach lines, the presence of old shorelines is still relevant from an archaeological standpoint.[29]

Evidence of archaeological sites that have been covered with water during certain times is supported by the presence of sites located below the historic shore lines. Stine specifically refers to one site (CA-INY-3541) located at approximately 3,586 feet, which appears to have been occupied between 2,000 and 1,000 years ago.[30] The presence of archaeological sites has also been reported below the historic shoreline at Pyramid Lake.[31] At Owens Lake, several sites have also been recorded in association with old spring mounds.[32] Using chronological data from the archaeological assemblage, combined with the information presented by Stine, researchers hypothesized that during low lake levels, occupational intensity around the springs was higher.[33]

5.2 PALEONTOLOGICAL RESOURCES

The National Environmental Policy Act (NEPA) and the Federal Land Policy and Management Act (FLPMA) both require the consideration of paleontological resources for undertakings on federally administered lands. An evaluation of the potential impacts of a proposed project on unique paleontological resources or sites is also necessary for compliance under the California Environmental Quality Act (CEQA). In the following section, the extant paleontological data for the cultural resources study area are summarized and the effects of the proposed project / proposed action on fossil resources are assessed.

5.2.1 Paleontological Setting

The cultural resources study area is located along the northeastern edge of Owens Lake at the base of the Inyo Mountains. These mountains form the southern extent of the larger White-Inyo Range, which extends in a south-southeast direction from Montgomery Pass in southern Nevada to

[27] Stine, S. 1994. *Late Holocene Fluctuations of Owens Lake, Inyo County, California*. Prepared for: Far Western Anthropological Research Group, Inc., Davis, CA.

[28] Stine, S. 1994. *Late Holocene Fluctuations of Owens Lake, Inyo County, California*. Prepared for: Far Western Anthropological Research Group, Inc., Davis, CA.

[29] Bacon, S.N., R.M. Burke, S.K. Pezzopane, and A.S. Jayko. 2005. "Last Glacial Maximum and Holocene Lake Levels of Owens Lake, Eastern California, USA." *Quaternary Science Reviews*, 1–19.

[30] Stine, S. 1994. *Late Holocene Fluctuations of Owens Lake, Inyo County, California*. Prepared for: Far Western Anthropological Research Group, Inc., Davis, CA.

[31] Mehringer, P.J., Jr., and Sheppard, J.C. 1978. *Holocene History of Little Lake, Mojave Desert, California*. Los Angeles, CA: Natural History Museum of Los Angeles County

[32] Wells, H. 2003. *Cultural Resources Survey for 2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan, Final Report*. Submitted by: Ancient Enterprises, Inc., Santa Monica, CA. Prepared by: Sapphos Environmental, Inc., Pasadena, CA. With contribution by Michael R. Walsh and illustrations by Clarus Backes.

[33] Jones and Stokes. 2005. *Final Archaeological Testing and Evaluation of 25 Sites on the Owens Lake Playa, Inyo County, California*. Volumes I and II. Prepared by: Jones and Stokes, Sacramento, CA. Prepared for: CH2MHILL, Santa Ana, CA.

Malpais Mesa east of Owens Lake.[34] The geologic stratigraphy of the White-Inyo Range encompasses a period of approximately 700 million years, with deposits dating from the Precambian to the Holocene.[35] The Inyo Mountains comprise the westernmost range of the Basin and Range structural province with the Owens Valley forming the westernmost basin within the physiographic province.[36]

5.2.2 Paleontological Resources Characterization

The results of the records searches at the Natural History Museum of Los Angeles County[37] and the San Bernardino County Museum[38] and the map review indicate that the surface geology of the study area primarily consists of alluvium, aeolian, and lacustrine units dating to the Quaternary Period. As illustrated in Figure 5.2.2-1, *Geological Map of Keeler Dunes Area Showing the APE*, much of the project / proposed action area is characterized by recent aeolian deposits consisting of active sand sheets and sand dunes interspersed with coarse Quaternary alluvial fan sediments; these deposits originate from the adjacent Inyo Mountains and typically do not contain significant vertebrate fossils.[39] Linear concentrations of artificial fill associated with the Caltrans diversion channel and a paved highway are also found in the area west of State Route 136; these anthropogenic deposits have a low potential of containing paleontological resources. Finally, surficial lacustrine sediments dating to the late Pleistocene and Holocene are located along the western edge of the proposed project / proposed action area (Figure 5.2.2-1). The Quaternary lake sediments probably derive from higher stands of Owens Lake during the Pleistocene and are therefore likely to contain the fossil remains of vertebrates and invertebrates dating to that epoch.[40]

A summary of the data provided by the Natural History Museum of Los Angeles County[41] and the San Bernardino County Museum[42] indicates four localities have been recovered from within 1 mile of the APE. These localities (LACM 7716–7719) have yielded a diverse taxonomic assemblage including bony fish (Teleostei), bird (Aves), jackrabbit (*Lepus*), pocket gopher (*Thomomys*), and even-toed ungulate (Artiodactyla).[43] These specimens were collected during previous surveys

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[34] Nelson, Clemens A., Clarence A. Hall, Jr., and W.G. Ernst. 1991. Geologic History of the White-Inyo Range. In *Natural History of the White Inyo-Range Eastern California*, edited by Clarence A. Hall, Jr., pp. 42-74. University of California Press, Berkeley.

[35] Nelson, Clemens A., Clarence A. Hall, Jr., and W.G. Ernst. 1991. Geologic History of the White-Inyo Range. In *Natural History of the White Inyo-Range Eastern California*, edited by Clarence A. Hall, Jr., pp. 42-74. University of California Press, Berkeley.

[36] Hunt, C.B. 1967. *Physiography of the United States*. San Francisco, CA: W.H. Freeman and Company.

[37] McLeod, Samuel, Natural History Museum of Los Angeles County. 11 October 2011. Letter response to Clarus Backes, Sapphos Environmental, Inc., Pasadena, CA.

[38] Scott, Eric, San Bernardino County Museum, Redlands, CA. 28 February 2012. Letter response to Tiffany Clark, Sapphos Environmental, Inc., Pasadena, CA.

[39] McLeod, Samuel, Natural History Museum of Los Angeles County. 11 October 2011. Letter response to Clarus Backes, Sapphos Environmental, Inc., Pasadena, CA.

[40] Scott, Eric, San Bernardino County Museum, Redlands, CA. 28 February 2012. Letter response to Tiffany Clark, Sapphos Environmental, Inc., Pasadena, CA.

[41] McLeod, Samuel, Natural History Museum of Los Angeles County. 11 October 2011. Letter response to Clarus Backes, Sapphos Environmental, Inc., Pasadena, CA.

[42] Scott, Eric, San Bernardino County Museum, Redlands, CA. 28 February 2012. Letter response to Tiffany Clark, Sapphos Environmental, Inc., Pasadena, CA.

[43] McLeod, Samuel, Natural History Museum of Los Angeles County. 11 October 2011. Letter response to Clarus Backes, Sapphos Environmental, Inc., Pasadena, CA.

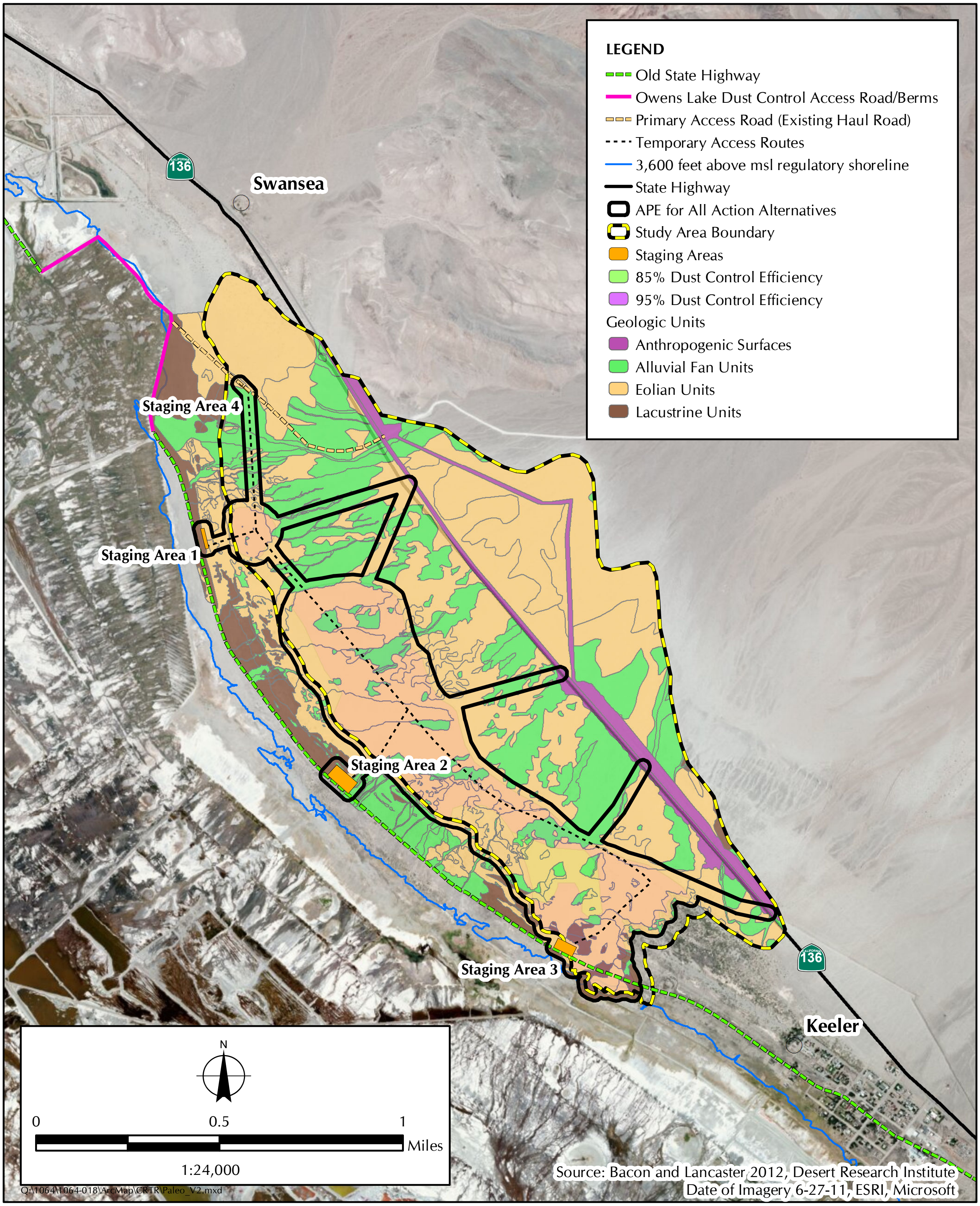

FIGURE 5.2.2-1
Geological Map of Keeler
Dunes Area Showing the APE

immediately outside of the current APE by Cogstone Resource Management Inc.[44] Within 5 miles of the APE, the Natural History Museum of Los Angeles County has recorded one locality (LACM 4691) immediately northwest of the proposed project / proposed action area near the mouth of the Owens River. This locality yielded the remains of a proboscidean, mountain lion (*Felis concolor*), horse (*Equus*), and camel (Camelidae).[45,46] The San Bernardino County Museum has two recorded localities (SBCM 6.6.3–6.6.4) from Quaternary alluvium in the same area as LACM 4691. These localities produced the remains of horse (*Equus*), camel (*Camelops*), and bison (*Bison*).[47] Smith et al.[48] reported the remains of a number of fossil fish including suckers (Catostomidae) and minnows (Cyprinidae) from the silty clays and sands of the lakebed approximately four miles to the south of Keeler near the intersection of highways 136 and 190.

The paleontological survey of three of the four proposed temporary staging areas, associated access routes, and 100-foot buffer determined that no surface fossils were located within the survey area. The survey determined that the proposed northwest-southeast access route is underlain by PFYC Class 2 dune sand and Quaternary alluvium with low paleontological sensitivity. The survey also determined that portions of Staging Area 1 and 2 and portions of temporary access roads leading to Staging Areas 2 and 3 within the APE are underlain by PFYC Class 4 Quaternary lacustrine deposits that are highly sensitive for paleontological resources.[49]

5.2.3 Assessment of Potential Impacts to Paleontological Resources

To evaluate the potential impacts of the proposed project / proposed action on paleontological resources in the Keeler Dunes locale, the APE was mapped in relation to geomorphic units within the proposed project / proposed action area (Figure 5.2.2-1). As previously discussed, the APE includes all of the elements and areas of planned ground disturbance, along with a 100-foot buffer. Figure 5.2.2-1 illustrates that most of the APE is characterized by surficial aeolian sediments consisting of active sand sheets and sand dunes; these sediments are interspersed with smaller surficial deposits of Quaternary alluvium. These geologic units exhibit PFYC Class 2 (low) sensitivity due to their young age (less than 10,000 years BP). Shallow excavations in these areas, which are expected to occur with the planting of vegetation, the placement of temporary wind breaks, and the construction of access routes, have little potential of encountering fossil remains.

Along with aeolian sediments and Quaternary alluvium present within the APE are small incursions of lacustrine deposits. These deposits are located in Staging Area 1 and 2 and portions of temporary

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[44] Gust, Sherri. 2003. Paleontological Assessment Report and Mitigation Plan for the Owens Valley Project, Inyo County, California. Report prepared for Sapphos Environmental, Inc., Pasadena, CA. Cogstone Resource Management Inc., Santa Ana, CA.

[45] Jefferson, G.T. 1989. Late Pleistocene and earliest Holocene fossil localities and vertebrate taxa from the western Mojave Desert. In Jefferson, G.T., ed., *The West-central Mojave Desert: Quaternary Studies between Kramer and Afton Canyon*, pp. 27–40. SBCM Association Special Publication, Redlands, CA.

[46] Jefferson, G.T. 1991. *A Catalogue of Late Quaternary Vertebrates from California: Part Two, Mammals*. Technical Reports No. 7. Natural History Museum of Los Angeles County, Los Angeles.

[47] Scott, Eric, San Bernardino County Museum, Redlands, CA. 28 February 2012. Letter response to Tiffany Clark, Sapphos Environmental, Inc., Pasadena, CA.

[48] Smith, G.R., Reynolds, R.E., and Serrano, R. J. 2009. Recent records of fossil fish from eastern Owens Lake, Inyo County, California. In Reynolds, R.E. and Jessey, D.R., eds., Landscape Evolution at an Active Plate Margin. The 2009 Desert Symposium Field Guide and Proceedings. California State University Desert Studies Symposium and LSA Associates Inc. pp. 176–183.

[49] SWCA Environmental Consultants. 2013. *Paleontological Survey Report for the Keeler Dunes Project, Owens Lake, Inyo County, California*. Report prepared for Sapphos Environmental, Inc., Pasadena, California.

access roads leading to Staging Areas 2 and 3 (Figure 5.2.2-1). These lacustrine deposits have a PFYC Class 4 (high) paleontological sensitivity due to the abundance of paleontological resource localities that have been identified in lacustrine deposits in the Keeler Dunes vicinity. Should ground disturbing activities be conducted at a depth greater than one foot within Staging Areas 1 and 2 and along the access roads leading to Staging Areas 2 and 3 an on-site paleontological monitor should also be present. Further, if previously undocumented fossil remains are encountered during proposed project / proposed action implementation, operations should be immediately stopped in the area and the BLM Bishop Field Office manager should be notified immediately. Once the find was assessed and evaluated, modification to the proposed project / proposed action would be made as needed to avoid impacts of these paleontological discoveries prior to the resumption of work.

5.3 CULTURAL RESOURCES

5.3.1 Prehistoric, Ethnographic, and Historic Contexts

5.3.1.1 Prehistoric Context

Archaeological sequences for the Great Basin are grouped into Early, Middle, and Late Holocene time frames, with period definitions varying by region. These chronological divisions correlate with climatic and environmental changes, and are continuously being refined as new data is collected and dating techniques are improved. The main prehistoric sequence used in the Great Basin was developed during the 1970s by Bettinger and Taylor[50] based on a series of radiocarbon dates obtained from Eastern California. Their sequence has been refined as more data is gathered from the region. In particular, investigations at the Lubkin Creek site (CA-INY-30) in the north of Owens Lake, have greatly contributed to the understanding of the archaeology of the region.[51]

The Owens Valley archaeological sequence is applied in the area where the proposed project / proposed action is located, but an equivalent chronology with different time period names is used just south in the Mojave Desert area. Both chronologies are presented in Table 5.3.1.1-1, *Regional Chronology*. Archaeological sites in desert regions of California are often limited to surface assemblages that lack datable organic materials or stratigraphic associations, and therefore archaeologists working in these regions rely largely on variations in projectile point morphology to place sites in time. In many cases, period designations share the name with the "index" projectile point type that is prevalent during that time period. It should be noted that each period ends when a new diagnostic projectile point type first occurs, not when the characteristic point type no longer occurs.[52]

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[50] Bettinger, R.L., and Taylor, R.E. 1974. "Suggested Revisions in Archaeological Sequences of the Great Basin in Interior Southern California." *Nevada Archaeological Research Paper*, *5*: 1–26.

[51] Basgall, M.E., and K.R. McGuire. 1988. *The Archaeology of CA-INY-30: Prehistoric Culture Change in the Southern Owens Valley, California*. Prepared by: Far Western Anthropological Research Group, Inc., Davis, CA. Prepared for: California Department of Transportation, Bishop, CA.

[52] Warren, C.N. 2002. "Time, Form, and Variability: Lake Mojave and Pinto Periods in Mojave Desert Prehistory." In W.J. Wallace and F.A. Riddell, eds., *Essays in California Archaeology: A Memorial to Franklin Fenenga*, pp. 137. *Contributions of the University of California Archaeological Research Facility*, *60*.

TABLE 5.3.1.1-1
REGIONAL CHRONOLOGY

Epoch	Owens Valley Region	Mojave Desert Region	Dates
Late Pleistocene	Paleoindian	Paleoindian	Pre 10,000 BP
Early Holocene	Early	Lake Mojave	10,000 ~ 7000 BP
Middle Holocene	Little Lake	Pinto	~7000 BP to ~3500 BP
Late Holocene	Newberry	Gypsum	~3150 BP to ~1350 BP
	Haiwee	Rose Spring	~1350 BP to ~650 BP
	Marana	Late Prehistoric	~650 BP to Historic Contact

Late Pleistocene

Little is known about the human occupation of this region during the Late Pleistocene, other than that fluted projectile points characteristic of the Paleoindian period have been found in several locations scattered throughout the desert. In the western Mojave Desert and southwestern Great Basin these points have generally been found as isolates in undatable surface contexts, and therefore have been associated with the Paleoindian period solely on the basis of their morphological similarity to securely dated Clovis projectile points from the Great Plains and Southwest regions.[53,54]

Early Holocene

Early Period (10,000 to 7000 BP)

A number of archaeological sites have been recorded in the western United States that date to the beginning of the Holocene period about 11,000 years BP; many of these Early Holocene sites are found along the shorelines of Pleistocene dry lakes. The generally accepted date range for the Early Holocene is set as before 6000 BP,[55] with more refined chronologies by Basgall and McGuire[56] between 6600 and 10,000 BP, and Gilreath and others[57] between 9500 and 7000 BP. The Early Holocene is characterized by the presence of large-stemmed and concave points known as Lake Mojave and Silver Lake. These point type designations correspond to the dry lakes where they were first found.[58]

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[53] Dillon, B.D. 2002. "California Palaeoindians: Lack of Evidence, or Evidence of a Lack?" In *Essays in California Archaeology: A Memorial to Franklin Fenenga*, ed. W.J. Wallace and F.A. Riddell, pp. 110–128. Berkeley, CA: Contributions of the University of California Archaeological Research Facility No. 60, p. 115.

[54] Sutton, M.Q. 1996. "The Current Status of Archaeological Research in the Mojave Desert." *Journal of California and Great Basin Anthropology*, *18*(2): 221–257.

[55] Bettinger, R.L., and Taylor, R.E. 1974. "Suggested Revisions in Archaeological Sequences of the Great Basin in Interior Southern California." *Nevada Archaeological Research Paper*, *5*: 1–26.

[56] Basgall, M.E., and K.R. McGuire. 1988. *The Archaeology of CA-INY-30: Prehistoric Culture Change in the Southern Owens Valley, California*. Prepared by: Far Western Anthropological Research Group, Inc., Davis, CA. Prepared for: California Department of Transportation, Bishop, CA.

[57] Gilreath, A.J., and Holanda, K.L. 2000. *By the Lake by the Mountains: Archaeological Investigations at CA-INY-4554 and INY-1428*. Prepared by: Far Western Anthropological Research Group, Inc., Davis, CA. Submitted to: California Department of Transportation, District 9, Bishop.

[58] Campbell, E.W.C., Campbell, W.H., Antevs, E., Amsden, C.E., Barbieri, J.A., and Bode, F.D. 1937. "The Archaeology of Pleistocene Lake Mojave." In *Southwest Museum Paper, 9*. Los Angeles, CA: Southwest Museum.

Little is known about the subsistence strategies during this period, although it is assumed that hunting was a primary focus. The presence of projectile points and the relative lack of ground stone tools indicative of plant processing lend credence to this view. Faunal assemblages at several sites of this period have also supported this assumption, with evidence for both small (e.g., lagomorph) and large (e.g., artiodactyl) animal exploitation.[59,60] As with the Paleoindian period, however, the presence of Lake Mojave period sites near extinct Pleistocene and Early Holocene lakes suggest a diverse range of plant and animal resources may have been utilized.

Middle Holocene

Little Lake Period (7000 to 3500/3150 BP)

The onset of the Middle Holocene is marked by a dryer and hotter climate throughout the deserts of the western United States. Under these conditions, the subsistence focus most likely shifted away from lakeshores toward upland resources as these lakes dried up. The Middle Holocene is characterized by the appearance of split-stemmed projectile points, such as the Pinto series and those similar to the Gatecliff series that has been defined for the central Great Basin.[61]

Pinto series projectile points are smaller than Lake Mojave points, and their name derives from the Pinto Basin, where they were first defined.[62] Currently, there is controversy regarding the time frame associated with this period, because of lack of chronometric data and disagreement on the definition and dating of Pinto series points.[63] Evidence of Little Lake and Lake Mojave occupation at the Lubkin Creek site is sparse and seems to indicate that both periods overlap.[64] The data consists of a few diagnostic artifacts and obsidian hydration data. The archaeological assemblage at the site indicates an emphasis on exploitation of animal resources.[65] Milling equipment is scant and is limited to pieces that appear to have had little use.[66] The presence of a variety of lithic materials

[59] Basgall, M.E. 2000. "The Structure of Archaeological Landscapes in the North-Central Mojave Desert." In *Archaeological Passages: A Volume in Honor of Claude Nelson Warren*, eds. J.S. Schneider, R.M. Yohe II, and J.K. Gardner. Hemet, CA: Western Center for Archaeology and Paleontology, Publications in Archaeology.

[60] Basgall, M.E., and M.C. Hall. 1994. "Perspectives on the Early Holocene Archaeological Record of the Mojave Desert." In *Kelso Conference Papers 1987–1992, A Collection of Papers and Abstracts from the First Five Kelso Conferences on the Prehistory of the Mojave Desert*, eds. G. Dicken Everson and Joan S. Schneider. Occasional Papers in Anthropology 4. Bakersfield, CA: California State University, Bakersfield, Museum of Anthropology.

[61] Thomas, D.H. 1981. "How to Classify the Projectile Points from Monitor Valley, Nevada." *Journal of California and Great Basin Anthropology*, *3*(1): 7–43. Banning, CA: Malki Museum, Inc.

[62] Campbell, E.W.C., and Campbell, W.H. 1935. "The Pinto Basin Site." *Southwest Museum Paper*, *9*. Los Angeles, CA: Southwest Museum.

[63] Warren, C.N. 2002. "Time, Form, and Variability: Lake Mojave and Pinto Periods in Mojave Desert Prehistory." In *Essays in California Archaeology: A Memorial to Franklin Fenenga*, ed. by W.J. Wallace and F.A. Riddell, pp. 129–141. *Contributions of the University of California Archaeological Research Facility*, *60*.

[64] Basgall, M.E., and K.R. McGuire. 1988. *The Archaeology of CA-INY-30: Prehistoric Culture Change in the Southern Owens Valley, California*. Prepared by: Far Western Anthropological Research Group, Inc., Davis, CA. Prepared for: California Department of Transportation, Bishop, CA.

[65] Basgall, M.E., and K.R. McGuire. 1988. *The Archaeology of CA-INY-30: Prehistoric Culture Change in the Southern Owens Valley, California*. Prepared by: Far Western Anthropological Research Group, Inc., Davis, CA. Prepared for: California Department of Transportation, Bishop, CA.

[66] Jones and Stokes. 2002a. *Archaeological Investigations at CA-INY-30, 200, 2001*. (J&S 01-006), pp. 8-9. Prepared by: Jones and Stokes, Sacramento, CA. Prepared for: Los Angeles Department of Water and Power.

obtained from distant sources and used for tool manufacturing reflects extensive travels of possibly hundreds of kilometers.[67,68]

Late Holocene

Newberry Period (3150 to 1350 BP)

During this period, climatic variations led to more favorable cooler and moister conditions. Archaeological data indicate that there is an increase in population and social complexity, and more evidence of trade networks is available. Although hunting of a variety of fauna continues to be an important part of the economy, there is an increase in the use of seeds as a food resource. Processing of seeds is evidenced by the presence of milling equipment in archaeological sites that date to this period. Larger settlements than those characteristic of the previous period are present. This period is characterized by Elko and Humboldt series projectile points, which appear to replace the Pinto points of the previous period. Occupancy at the Lubkin Creek site during the Newberry period is evidenced by the presence of Elko and Humboldt Basal-notched projectile points and radiocarbon dates from a structure floor that range from 1860 $\pm$ 70 to 1220 $\pm$ 70 years BP. Cultural material representing activity throughout the Newberry Period at Lubkin Creek suggests that the site was a "seasonally occupied residential base."[69]

Haiwee Period (1350 to 650 BP)

Climatic conditions were variable during the Haiwee period, with temperate conditions followed by a series of droughts. This period is characterized by the introduction of smaller points, replacing the Elko and other large dart-size points from the previous period. These smaller points are known as Rose Spring[70] and Eastgate, and are often grouped together under the name Rosegate.[71] The presence of these smaller projectile points coincides with the introduction of a remarkable technological advance, the bow and arrow.[72,73] The variable climatic conditions may also be associated with the Numic expansion toward the later portion of the Haiwee period. It is hypothesized that Numic speakers spread from southeastern California throughout the Great

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[67] Basgall, M.E. 1989. "Obsidian Acquisition and Use in Prehistoric Central-Eastern California: A Preliminary Assessment." In *Current Directions in California Obsidian Studies*, ed. R.E. Hughes. Contributions of the University of California Archaeological Research Facility, 48. Berkeley, CA: University of California Archaeological Research Facility.

[68] Basgall, M.E., and K.R. McGuire. 1988. *The Archaeology of CA-INY-30: Prehistoric Culture Change in the Southern Owens Valley, California*. Prepared by: Far Western Anthropological Research Group, Inc., Davis, CA. Prepared for: California Department of Transportation, Bishop, CA.

[69] Basgall, M.E., and K.R. McGuire. 1988. *The Archaeology of CA-INY-30: Prehistoric Culture Change in the Southern Owens Valley, California*. Prepared by: Far Western Anthropological Research Group, Inc., Davis, CA. Prepared for: California Department of Transportation, Bishop, CA.

[70] Lanning, E.P. 1963. "The Archeology of Rose Spring Site Iny-372." *University of California Publications in American Archaeology and Ethnology*, *49*(3): 237–336.

[71] Thomas, D.H. 1981. "How to Classify the Projectile Points from Monitor Valley, Nevada." *Journal of California and Great Basin Anthropology*, *3*(1): 7–43. Banning, CA: Malki Museum, Inc.

[72] Yohe, R.M., II. 1992. *A Reevaluation of Western Great Basin Cultural Chronology and Evidence for the Timing and Introduction of the Bow and Arrow to Eastern California Based on New Excavations at the Rose Spring Site (CA-INY-372)*. PhD Dissertation, University of California, Riverside.

[73] Yohe, R.M., II. 1998. "The Introduction of the Bow and Arrow and Lithic Resource Use at Rose Spring (CA-INY-372)." *Journal of California and Great Basin Anthropology*, *20*(1).

Basin.[74,75,76] Data from the Rose Spring site (CA-INY-372) in the Rose Valley, just south of Owens Lake, indicate that bow and arrow technology may have appeared around 1500 BP.[77] Archaeological contexts also show the use of bedrock milling features, along with portable milling equipment.

Marana Period (650 to Historic Contact, Circa AD 1770)

This period is characterized by the first appearance of Desert side-notched and Cottonwood series projectile points. In addition, pottery appears for the first time represented by the Owens Valley brown ware.[78] During Marana times, the size of annual foraging ranges decreased, and the inhabitants of the Owens Valley adopted a more sedentary way of life than that known for the rest of the Great Basin. This is evidenced by the appearance of continuously occupied valley-floor villages; these are often associated with satellite villages that served as bases for the procurement of specific resources such as pinyon, ricegrass, or alpine plants.[79]

Data from Lubkin Creek indicate that the most extensive period of occupation at this site occurred during the Marana period. Basgall and McGuire[80] found three discrete midden deposits, structural (habitation floors) remains, and a large amount of Desert series projectile points and Owens Valley brown ware pottery. In addition, over 150 diagnostic late prehistoric beads were recovered. Researchers argued that the archaeological evidence from the Lubkin Creek site does not fit the definition of a village settlement; rather, the data suggest that the site was used intermittently for over 700 years as a temporary habitation locale or during short-term periods for food procurement and processing.[81]

5.3.1.2 Regional Ethnography

The Owens Valley area was primarily inhabited by the Owens Valley Paiute during prehistoric times; by the time of Euro-American contact, Western Shoshone populations were also present in the area. Currently, descendants of both groups still live in the valley, mostly within the reservations. Four reservations are located in the Owens Valley just north of Owens Lake: Lone

[74] Bettinger, R.L., and Baumhoff, M.A. 1982. "Numic Spread: Great Basin Cultures in Competition." In *American Antiquity*, *47*: 485–503.

[75] Madsen, D.B., and Rhode, D. 1994. *Across the West: Human Population Movement and the Expansion of the Numa*. Salt Lake City, UT: University of Utah Press.

[76] Sutton, M.Q. 1996. "The Current Status of Archaeological Research in the Mojave Desert." *Journal of California and Great Basin Anthropology*, *18*(2): 221–257.

[77] Yohe, R.M., II. 1992. *A Reevaluation of Western Great Basin Cultural Chronology and Evidence for the Timing and Introduction of the Bow and Arrow to Eastern California Based on New Excavations at the Rose Spring Site (CA-INY-372)*, pp. 53. PhD Dissertation, University of California, Riverside.

[78] Bettinger, R.L., and Baumhoff, M.A. 1982. "Numic Spread: Great Basin Cultures in Competition." In *American Antiquity*, *47*: 485–503.

[79] Bettinger, Robert L. 1999. From Traveler to Processor: Regional Trajectories of Hunter–Gatherer Sedentism in the Inyo-Mono Region, California. In Billman, B. R., and Feinman, G. M., eds., *Settlement Pattern Studies in the Americas, Fifty Years Since Viru,* Smithsonian Institution Press, Washington, DC, pp. 39–55.

[80] Basgall, M.E., and K.R. McGuire. 1988. *The Archaeology of CA-INY-30: Prehistoric Culture Change in the Southern Owens Valley, California*. Prepared by: Far Western Anthropological Research Group, Inc., Davis, CA. Prepared for: California Department of Transportation, Bishop, CA.

[81] Basgall, M.E., and K.R. McGuire. 1988. *The Archaeology of CA-INY-30: Prehistoric Culture Change in the Southern Owens Valley, California*. Prepared by: Far Western Anthropological Research Group, Inc., Davis, CA. Prepared for: California Department of Transportation, Bishop, CA.

Pine, Big Pine, Fort Independence, and Bishop. One of the earliest references to the Owens Valley Paiute and the Shoshone is that by Kroeber;[82] however, later ethnographic works by Steward[83,84,85] and Driver[86] have become the standard reference for these groups.

Owens Valley Paiute

The Owens Valley Paiute inhabited the area located between the head waters of the Owens River (about 25 miles north of Bishop) to the south portion of Owens Lake. They spoke dialects of Mono, which is one of the divisions of the Western Numic segment of the Numic branch of Uto Aztecan languages.[87,88] Lamb divided the Mono speech forms present on both sides of the Sierras into three dialectical groups: Northwestern Mono, Northeastern Mono, and Southern Mono. The most widespread dialect was the Southern Mono, with a subdialect that was still known by some speakers in Lone Pine, Big Pine, and Fort Independence during the 1980s.[89] However, Liljeblad and Fowler indicate that isolated groups that lived in areas near Euro-American towns had lost any knowledge of their native language by 1985.[90]

Population density of the Owens Valley Paiute is higher and settlement patterns are more sedentary than that of any other group in the Great Basin, with population estimates before contact times ranging between 1,000 and 2,000 people.[91,92,93] The Owens Valley Paiute lived in villages distributed along water courses. The number of villages was higher in the northern Owens Valley than the southern portion due to the presence of major water sources. In the southern Owens Valley, semipermanent settlements were limited to those areas near springs and small streams at the foot of the mountains.[94]

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[82] Kroeber, A.L. 1925. *Handbook of the Indians of California*, p. 556. New York, NY: Dover Publications, Inc.

[83] Steward, J.H. 1934. "Two Paiute Ethnographies." *University of California Publications in American Archaeology and Ethnology*, *33*(5): 423–438.

[84] Steward, J.H. 1937. "Linguistic Distributions and Political Groups of the Great Basin Shoshoneans." *American Anthropologist*, *39*(4): 625–634.

[85] Steward, J.H. 1938. "Basin Plateau Aboriginal Sociopolitical Groups." *Bureau of American Ethnology Bulletin*, *120*. Washington, DC.

[86] Driver, H.E. 1937. "Cultural Element Distributions, VI: Southern Sierra Nevada." *University of California Anthropological Records*, *1*(2): 53–154. Berkeley, CA.

[87] Liljeblad, S., and Fowler, C.S. 1986. "Owens Valley Paiute." In *Handbook of North American Indians*, Volume 11, Great Basin, pp. 412–434. Washington, DC: Smithsonian Institution.

[88] Miller, W.R. 1986. "Numic Languages." In *Handbook of North American Indians*, Volume 11, Great Basin, pp. 98–106. Washington, DC: Smithsonian Institution.

[89] Lamb, S.M. 1958. *Northfork Mono Grammar*. Unpublished PhD Dissertation in Linguistics, University of California Berkeley.

[90] Liljeblad, S., and Fowler, C.S. 1986. "Owens Valley Paiute." In *Handbook of North American Indians*, Volume 11, Great Basin, pp. 412–434. Washington, DC: Smithsonian Institution.

[91] Chalfant, W.A. 1933. *The Story of Inyo*. Bishop, CA: Chalfant Press.

[92] Liljeblad, S., and Fowler, C.S. 1986. "Owens Valley Paiute." In *Handbook of North American Indians*, Volume 11, Great Basin, pp. 412–434. Washington, DC: Smithsonian Institution.

[93] Steward, J.H. 1933. "Ethnography of the Owens Valley Paiute." *University of California Publications in American Archaeology and Ethnology*, *33*(3): 233–350.

[94] Liljeblad, S., and Fowler, C.S. 1986. "Owens Valley Paiute." In *Handbook of North American Indians*, Volume 11, Great Basin, pp. 412–434. Washington, DC: Smithsonian Institution.

The Owens Valley Paiute traveled throughout the year on a seasonal basis following available food resources. A wide variety of seeds, plants, and roots were part of their diet, as their territory extended through different environmental zones, but the seeds from the pinyon (*Pinus monophylla*) were a primary source of food.[95] These pine nuts would ripen in the fall and families traveled during October and November to pine nut–rich areas in the Inyo and White Mountains for collection and processing. Families would camp near nut caches in years of abundant crops; however, during scarce years, the nuts were carried to the villages in the valley floor.[96] Acorns are a more reliable crop and were preferred over the pine nuts; however, these were not readily available in the area. These were mostly obtained through trade and occasionally collected from the oaks that grew on the eastern slopes of the Sierra Nevada.[97]

Archaeological investigations and ethnographic studies have indicated that the Owens Valley Paiute practiced irrigation of wild plants, specifically hydrophytic species. Thus, irrigation during spring and summer months increased water flow to the areas that were naturally flooded.[98] Although early works such as those by Chalftant[99] and Steward[100] have suggested that this practice was acquired post-Contact, Bettinger[101] and Lawton and others[102] have indicated that this was implemented in prehistoric times. Irrigation occurred by diverting streams to plots where the tubers of the groundnut (*Brodiaea capitata*) and spikerush (*Heleocharis* sp.) occurred naturally.

The diet of the Owens Valley Paiute Shoshone was complemented by hunting and fishing. Deer (*Odocoileus*) and bighorn sheep (*Ovis canadensis*), as well as rabbits, were hunted individually or during group hunts in the Sierras and White and Inyo Mountains.[103] Rabbit hunting was predominant; these were taken with bow and arrow or through rabbit drives.[104] Liljeblad and Fowler[105] indicate that fishing was not a widespread practice; the Owens River contained small fish only, and the lake was nearly devoid of it due to the high alkaline conditions. However, chronicles from Captain J.W. Davidson indicate that at least during the 1800s, large quantities of small fish

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[95] Steward, J.H. 1933. "Ethnography of the Owens Valley Paiute." *University of California Publications in American Archaeology and Ethnology*, *33*(3): 233–350.

[96] Bettinger, R.L. 1975. "The Surface Archaeology of Owens Valley, Eastern California: Prehistoric Man-Land Relationships in the Great Basin", pp. 61-62. PhD dissertation, University of California, Riverside, Department of Anthropology.

[97] Liljeblad, S., and Fowler, C.S. 1986. "Owens Valley Paiute." In *Handbook of North American Indians*, Volume 11, Great Basin, pp. 416. Washington, DC: Smithsonian Institution.

[98] Bettinger, R.L. 1975. "The Surface Archaeology of Owens Valley, Eastern California: Prehistoric Man-Land Relationships in the Great Basin", pp. 61. PhD dissertation, University of California, Riverside, Department of Anthropology.

[99] Chalfant, W.A. 1933. *The Story of Inyo*. Bishop, CA: Chalfant Press.

[100] Steward, J.H. 1938. "Basin Plateau Aboriginal Sociopolitical Groups." *Bureau of American Ethnology Bulletin*, *120*. Washington, DC.

[101] Bettinger, R.L. 1975. "The Surface Archaeology of Owens Valley, Eastern California: Prehistoric Man-Land Relationships in the Great Basin", pp. 61. PhD dissertation, University of California, Riverside, Department of

[102] Lawton, H.W., Wilke, P.J., DeDecker, M., and Mason, W.M. 1976 "Agriculture Among the Paiute of Owens Valley." *The Journal of California Anthropology*, *3*: 13–50.

[103] Steward, J.H. 1933. "Ethnography of the Owens Valley Paiute." *University of California Publications in American Archaeology and Ethnology*, *33*(3): 233–350.

[104] Liljeblad, S., and Fowler, C.S. 1986. "Owens Valley Paiute." In *Handbook of North American Indians*, Volume 11, Great Basin, pp. 418. Washington, DC: Smithsonian Institution.

[105] Liljeblad, S., and Fowler, C.S. 1986. "Owens Valley Paiute." In *Handbook of North American Indians*, Volume 11, Great Basin, pp. 418. Washington, DC: Smithsonian Institution.

were caught using sieve-like baskets and then dried in the sun.[106] In addition, Steward[107] indicates that two types of fish, the Owens sucker (*Catostomus fumeiventris*) and the Owens tui chub (*Gila bicolor snyderi*), were in some instances an important part of the Paiute's diet. Steward[108] and Wilke and Lawton[109] also mention the consumption of a small brine fly (*Ephydra hians*), which is common in the Mono and Owens Lakes. Both the larvae and pupa were prepared differently, and were only an important source of food in Mono and Owens Lakes.

The Owens Valley Paiute practiced exogamy within the different villages, and marriage between any relatives was forbidden. Children were associated with their mother's village but could not marry within their father's village. Each village was composed of extended families that were considered to be all relatives.[110]

Western Shoshone

The Western Shoshone occupied a large territory that included the area immediately south and east of Owens Lake, extending north and northeast through Nevada and Utah,[111] sharing the territory near Owens Lake with the Owens Valley Paiute.[112] They spoke different varieties of Central Numic, which is a component of the Numic branch of the Uto-Aztecan family. Central Numic is composed of three different languages: Panamint, Shoshone, and Comanche.[113]

Estimates of Western Shoshone population are scant, and the best documented information comes from early writers (mostly early settlers and government officials) during the 1930s. Steward[114] presents a population density of one person per 16.6 square miles adjacent to the northeast portion of Owens Lake, but does not provide any figures for the area immediately south of the lake. Shoshone population density was lower than that of the Owens Valley Paiute, and their degree of mobility was higher. According to Steward,[115] the valleys where most of the Shoshone populations resided were not abundant in resources, thus limiting the ability for large groups to remain in one place for longer periods of time. In addition, a high reliance on pine nuts, the yield of which varied from year to year, generated a less sedentary way of life among the Shoshone. Other plants

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[106] Wilke, P.J., and Lawton, H.W., Editors. 1976. *The Expedition of Capt. J. W. Davidson from Fort Tejon to the Owens Valley in 1859*, pp. 29. Socorro, NM: Ballena Press.

[107] Steward, J.H. 1933. "Ethnography of the Owens Valley Paiute." *University of California Publications in American Archaeology and Ethnology*, *33*(3): 233–350.

[108] Steward, J.H. 1933. "Ethnography of the Owens Valley Paiute." *University of California Publications in American Archaeology and Ethnology*, *33*(3): 233–350.

[109] Wilke, P.J., and Lawton, H.W., Editors. 1976. *The Expedition of Capt. J. W. Davidson from Fort Tejon to the Owens Valley in 1859*, pp. 30. Socorro, NM: Ballena Press.

[110] Steward, J.H. 1933. "Ethnography of the Owens Valley Paiute." *University of California Publications in American Archaeology and Ethnology*, *33*(3): 233–350.

[111] Steward, J.H. 1938. "Basin Plateau Aboriginal Sociopolitical Groups." *Bureau of American Ethnology Bulletin*, *120*. Washington, DC.

[112] Liljeblad, S., and Fowler, C.S. 1986. "Owens Valley Paiute." In *Handbook of North American Indians*, Volume 11, Great Basin, pp. 413, Figure 1. Washington, DC: Smithsonian Institution.

[113] Thomas, D.H., Pendleton, L., and Cappannari, S. 1986. "Western Shoshone." In *Handbook of North American Indians*, Volume 11, Great Basin, pp. 262. Washington, DC: Smithsonian Institution.

[114] Steward, J.H. 1938. "Basin Plateau Aboriginal Sociopolitical Groups." *Bureau of American Ethnology Bulletin*, *120*, pp. 47. Washington, DC.

[115] Steward, J.H. 1937. "Linguistic Distributions and Political Groups of the Great Basin Shoshoneans." *American Anthropologist*, *39*(4): 625–634.

consumed by the Shoshone include a type of sunflower, which was available in an area near Keeler,[116] and acorns from the Sierras. From spring to fall, the Shoshone traveled in small groups collecting food, following the availability of resources. During the winter months, groups of families stayed in warmer places near food caches, mostly pine nuts, and accessible water.[117] According to Irwin,[118] the Shoshone also practiced a form of incipient agriculture similar to the Owens Valley Paiute, consisting of the irrigation of wild plants.

Hunting activities were also part of the Shoshonean way of life. Bighorn sheep hunts were mostly carried out during the summer.[119] During winter months, hunting activities were focused on migrating species. Steward[120] described subsistence activities for the Shoshone at the Koso Hot Spring Village, located about 20 miles south of Owens Lake. He indicates that rabbit hunts were a common practice, and communal hunting of pronghorn antelope (*Antilocarpa americana*) took place in areas where these animals were available, such as the Indian Wells Valley (south of Little Lake), and in some areas just south of Owens Lake.

Shoshone families were politically independent and remained isolated throughout most of the year.[121] However, marriage took place between families that had contact with one another, such as during plant collection trips or communal hunting. Marriage was more a contract between families than between individuals. The preferred arrangement for marriage among the Shoshone consisted of several marriages between the children of two families.[122]

5.3.1.3 Historic Context

Early Euro-American Exploration

Native American groups were subject to dramatic social and cultural changes after the Spanish began colonizing coastal California in 1769. Of primary importance in affecting these changes were the establishment of the Spanish mission system throughout California and the introduction of new diseases, which spread rapidly and decimated the native population. Although the initial occupation of California occurred relatively quickly along the coastlines, the interior portion of California, such as the Owens Valley, did not feel the effects until much later.[123]

The first Euro-Americans to visit the Owens Valley were probably mountain men and prospectors. Peter Skene Ogden, a Canadian fur trapper, traveled into Owens Valley and south along the

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[116] Irwin, C.N. 1980. *The Shoshone Indians of Inyo County, California. The Kerr Manuscript*. Independence, CA: Ballena Press.

[117] Steward, J.H. 1972. *Theory of Culture Change, the Methodology of Multilinear Evolution*, pp. 114, 115. Chicago, IL: University of Illinois Press

[118] Irwin, C.N. 1980. *The Shoshone Indians of Inyo County, California. The Kerr Manuscript*, pp. xi. Independence, CA: Ballena Press.

[119] Thomas, D.H. 1983. "The Archaeology of Monitor Valley I: Epistemology." *Anthropological Papers of the American Museum of Natural History*, *59*(1).

[120] Steward, J.H. 1938. "Basin Plateau Aboriginal Sociopolitical Groups." *Bureau of American Ethnology Bulletin*, *120*, pp. 81-82. Washington, DC.

[121] Steward, J.H. 1938. "Basin Plateau Aboriginal Sociopolitical Groups." *Bureau of American Ethnology Bulletin*, *120*, pp. 56. Washington, DC.

[122] Steward, J.H. 1972. *Theory of Culture Change, the Methodology of Multilinear Evolution*, pp. 118-119. Chicago, IL: University of Illinois Press.

[123] Wehrey, J. 2006. *Voices from this Brown Land*, pp. 2. New York, NY: Palgrave Macmillan.

eastern edge of the Sierra Nevada Mountains while exploring for the Hudson's Bay Company in 1829.[124] Joseph Reddeford Walker, also a fur trapper, traveled to the Owens Valley in 1834. Walker was a fur trapper who traversed the valley several times. In 1843, Walker led the J.B. Childs (Chiles) party to California by way of the Humboldt Sink, Walker Lake, Owens Valley, and Walker Pass. Walker followed the same passage in 1845 on John Fremont's third expedition through California. It was during this expedition that Fremont named the Owens Valley after his traveling companion, Dick Owens, even though it is believed that neither one of them had actually set foot in the valley.[125] One of the earliest surveys of the Owens Valley was conducted in 1855–1856 by Henry Washington and A.W. von Schmidt, who were sent by the U.S. Bureau of Land Management and the State of California Surveyors Office.[126] The exploration of the Owens Valley by Euro-Americans is directly linked with the lives of the Native Americans, the Owens Valley Paiute, who lived in the area at the time of the first expeditions. The first explorers left scant records concerning these expeditions and the native populations of the Owens Valley. Nonetheless, Schmidt made the first description of the irrigation methods used by the Owens Valley Paiute,[127] and Captain J.W. Davidson during his expedition from Fort Tejon to the Owens Valley in 1859 also described the lives of the Paiute. As a result of his expeditions, Captain Davidson suggested that the government should protect the Native Americans and that a portion of land should be set aside for a reservation, which from his point of view could be self-sustaining.[128] This was the first of many attempts to create reservations in the area.

Development of Towns and Industries

Substantial settlement of the Owens Lake region by Euro-Americans began in 1861, when Barton and Alney McGee introduced a small herd of cattle and built a log cabin in the area that would later become the town of Lone Pine.[129] Beginning in the 1870s, the mining and soda extraction industries caused a number of towns to spring up around Owens Lake: Swansea and Keeler on the east shore of the lake were centers for silver smelting and mineral extraction, while Olancha and Cartago on the western shore were important transportation centers for freight and raw materials moving in and out of the region. A summary of the history of these five towns is presented below; their locations are shown on Figure 2.1-1.

<u>Lone Pine</u>

In 1860, a loosely organized prospecting camp known as the "Hill Party" was located in the area that would later become the town of Lone Pine, where independent prospectors searched for gold and silver.[130] In 1861, Barton and Alney McGee raised cattle and built a log cabin in the area.[131] In

[124] Dictionary of Canadian Biography. 2013. Peter Skene Ogden. Accessed online on September 4, 2013 at: http://www.biographi.ca/en/bio.php?id_nbr=4109

[125] Wilke, P.J., and Lawton, H.W., Editors. 1976. *The Expedition of Capt. J. W. Davidson from Fort Tejon to the Owens Valley in 1859*, pp. 9. Socorro, NM: Ballena Press.

[126] Wilke, P.J., and Lawton, H.W., Editors. 1976. *The Expedition of Capt. J. W. Davidson from Fort Tejon to the Owens Valley in 1859*, pp. 9. Socorro, NM: Ballena Press.

[127] Lawton, H.W., Wilke, P.J., DeDecker, M., and Mason, W.M. 1976 "Agriculture Among the Paiute of Owens Valley." *The Journal of California Anthropology*, *3*: 13–50.\

[128] Lawton, H.W., Wilke, P.J., DeDecker, M., and Mason, W.M. 1976 "Agriculture Among the Paiute of Owens Valley." *The Journal of California Anthropology*, *3*: 13–50.

[129] Jones and Stokes. 2007. *Cultural Resources Inventory of Two Parcels in the Moat and Row Testing Area, Owens Lake Dust Mitigation Program, Inyo County, California*, pp. 12. Prepared for: City of Los Angeles Department of Water and Power.

[130] DeDecker, M. 1966. *Mines of Eastern Sierra*, pp. 41. Glendale, CA: La Siesta Press.

the 1870s, Lone Pine was the commercial center providing goods and services to the mines located throughout the Owens Valley. On March 26, 1872, an earthquake took place on the eastern side of Sierra Nevada. Twenty-three deaths were reported, and 52 of the 59 adobe houses in the town were destroyed. The earthquake forced the mountain range upward, relative to the valley, approximately 13 feet, while producing a lateral slide to the northwest by about 16 feet. The surface ruptured along a fault line that was noticeable for a distance of approximately 100 miles, and the quake could be felt as far away as San Diego.[132] At Owens Lake, the shoreline at Swansea receded 150 feet, requiring an extension for the newly constructed steamboat wharf.[133]

Swansea

Swansea is located 9 miles southeast of Lone Pine along State Route 136. Swansea, named for the town in Wales, held the smelter of the Owens Lake Company and was the final destination of the silver ore mined from Cerro Gordo. The smelter operated from 1869 through 1874 and at its peak produced 150 bars of silver ore per day weighing 83 pounds each. The Owens Lake Company owned the steamer Bessie Brady, and in 1872 the company constructed a 300-foot wharf for the steamer located at Swansea.[134] In 1874, the Owens Lake Company went bankrupt and the steamer Bessie Brady was sold and moved to Keeler. That same year a rain storm buried Swansea under several feet of mud and debris, and today all that remains of Swansea are the ruins of the brick smelter.[135]

Keeler

Keeler is located 15 miles southeast of Lone Pine along State Route 136. In 1873, as part of the Cerro Gordo Freight Company's consolidation, a new wharf was constructed for the steamer Bessie Brady on the northeast shore of Owens Lake, in an area that would later be known as the community of Keeler. In 1879, Captain Julius M. Keeler, acting on the behalf of David N. Hawley and other east coast financiers, formed the Owens Lake Mining and Milling Company. The group purchased the Union Consolidated Mine and made plans to construct a ten-stamp mill at the community of Keeler, locally known as Hawley. On March 1, 1880, with the groundbreaking of the new mill, the site was renamed Keeler.[136] In July of 1883, the Carson & Colorado Railroad line was completed at Keeler.[137]

By 1920, Keeler was the wealthiest community in Inyo County. Keeler had schools, hotels, and a Chinatown district, and was the main depot for the Carson & Colorado Railroad.[138] The community contained three chemical processing plants and produced 47,000 tons of soda ash bicarbonate

[131] Jones and Stokes. 2007. *Cultural Resources Inventory of Two Parcels in the Moat and Row Testing Area, Owens Lake Dust Mitigation Program, Inyo County, California*, pp. 12. Prepared for: City of Los Angeles Department of Water and Power.

[132] Fiero, B. 1986. *Geology of the Great Basin*, p. 189. Reno, NV: University of Nevada Press.

[133] DeDecker, M. 1966. *Mines of Eastern Sierra*, pp. 61. Glendale, CA: La Siesta Press.

[134] Chalfant, W.A. 1933. *The Story of Inyo*, pp. 290. Bishop, CA: Chalfant Press.

[135] Nadeau, R. 1958. *Ghost Towns and Mining Camps of California*, pp. 188. Los Angeles, CA: The Ward Ritchie Press.

[136] Ligenenfelter, R. 1962. 'The Desert Steamers." *Journal of the West*, *1*(2).

[137] Due, J. 1951. "The Carson and Colorado Railroad." *Economic Geography*, *27*(3): 251–267.

[138] Krautter, F. 1959. *The Story of Keeler*. Independence, CA: Owens Inyo Company.

each year, which constituted more than half of all the soda products consumed in the United States annually.[139]

Olancha

Olancha is located where the current U.S. Highway 395 intersects State Route 190. Beginning in the late 1860s, the town, which included a stagecoach depot, was a principal logistical and transportation center between the Cerro Gordo silver mines and Los Angeles. After the mining operations at Cerro Gordo ceased, Olancha turned into an agricultural center, and with the arrival of Southern Pacific Railroad in 1910, it became a hub for the distribution of materials used for the construction of the Los Angeles Aqueduct.[140] In 1862, M.H. Farley built the first mill in the Owens Valley along Olancha Creek, approximately 0.5 mile south of the location that would later become the town.[141] The following year, Farley built a stamp mill, a blacksmith shop, and a sawmill, all which were burned down by local Native Americans in 1867.

Cartago

Cartago is located on U.S. Highway 395, approximately 18 miles south of the town of Lone Pine. Located on the south side of Owens Lake, the town was originally known as Daneri's Landing, where the steamers *Bessie Brady* and *Mollie Stevens* were moored. The Cerro Gordo Freight Company was headquartered at Cartago, which was the starting point for mule trains transporting silver bullion south to Los Angeles.[142] The volume of bullion extracted from the mines so exceeded the capacity of the mule trains that in 1872 temporary housing was built at Cartago from the estimated 18,000 bars of silver awaiting shipment to Los Angeles. With the decline of silver production, and the arrival of the Southern Pacific Railroad, Cartago became a transportation center for the chemicals and soda products being processed at Owens Lake.[143] The California Alkali Company plant was established in Cartago in 1917, but was closed down soon after the end of World War I, and was purchased by the Inyo Chemical Company in 1923. The Inyo Chemical Company processed soda products and chemicals, and operated an ice plant at Cartago.[144]

Industrial Developments in the Owens Valley

Silver mining was one of the earliest industries established in the Owens Valley. By the turn of the century, however, precious metal mining had given way to the large-scale commercial production and extraction of mineral resources from Owens Lake. A description of the various mining activities and facilities that operated historically in the Owens Valley is provided below.

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[139] Kahrl, W. 1982. *Water and Power*, pp. 224. Berkeley, CA: University of California Press.

[140] Wright, D. 2005. "California Ghost Towns." Available at http://www.ghosttowns.com/states/ca/olancha.html

[141] Roberts, G., and Roberts, J. 2004. *Discover Historic California*, pp. 535. Baldwin Park, CA: Gem Guides Book Company.

[142] DeDecker, M. 1966. *Mines of Eastern Sierra*, pp. 61. Glendale, CA: La Siesta Press.

[143] Jones and Stokes. 2007. *Cultural Resources Inventory of Two Parcels in the Moat and Row Testing Area, Owens Lake Dust Mitigation Program, Inyo County, California*, pp. 13. Prepared for: City of Los Angeles Department of Water and Power.

[144] Pipkin, G. 1974. *Cartago, My Cartago*, pp. 2-3. Unpublished manuscript on file at the Eastern California Museum, Independence, CA.

Cerro Gordo Mines

In 1865, a Mexican American named Pablo Flores discovered the largest silver strike in California at Cerro Gordo (Fat Hill). The Cerro Gordo mines were located on the western slope of Buena Vista Peak in the southern Inyo Mountains.[145] The Cerro Gordo mines produced over 15 million dollars' worth of silver ore.

In 1866, Mortimer W. Belshaw, a mining engineer, and his partner Adbner B. Elder came from San Francisco and started the Union Mining Company by staking claims at Cerro Gordo and buying the Union Mine.[146] Mr. Belshaw realized that the wealth of Cerro Gordo was not found by mining silver alone, but was made by owning the silver ore processing facilities, controlling transportation, and supplying water to the mines. Mr. Belshaw built a smelting furnace to process lead-ore from the Union Mine, and constructed a toll road on the only passable road (the Yellow Grade) to and from Cerro Gordo to Owens Lake. He also piped water in from the nearest natural spring, which he controlled, to Cerro Gordo. Through these efforts, Mr. Belshaw largely controlled the Cerro Gordo mines.[147] By 1871, the town of Cerro Gordo was well established.

In 1870, Belshaw bought out Elder and formed a new partnership with Victor Beaudry, who had purchased a half interest in the Union Mine. Together Belshaw and Beaudry built a new smelting furnace, and by 1874 the smelting operation was producing 18 tons of bullion per day. The firewood required for increased smelting production at Cerro Gordo and at Owens Lake had stripped the surrounding forest lands bare on the Inyo Mountains by the mid-1870s.[148]

As shortages of natural resources increased, accompanied by the logistical problems caused by the remote location of the Cerro Gordo mines, competitive pressures accelerated among the various mining companies. Belshaw of the Union Consolidated Company increased the toll charges on the Yellow Grade, the only road from Cerro Gordo to Swansea, cutting the Owens Lake Silver-Lead Company's ore processing capacity in half. The Owens Lake Silver-Lead Company fought back in the courts and eventually won, but the production loss, court delays, and legal fees forced the company into bankruptcy in the spring of 1874. Belshaw and the Union Consolidated Company were also victims of court fights and legal fees in their attempt to protect their mining claims against outside interests. These actions forced the Union Consolidated Company to cease operations in 1878.[149]

Cottonwood Charcoal Kilns

In the 1870s, smelting operations led to deforestation in the Inyo Mountains, and local mining companies required new sources of fuel if the silver smelting furnaces were to continue to operate. The Cottonwood Charcoal Kilns, located north of Cartago, were beehive kilns that turned wood into charcoal. The charcoal was transported across the lake at Cartago by the steamers Bessie Brady and Mollie Stevens, and then used as fuel for the silver smelting furnaces that supported the Cerro Gordo mines.

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[145] DeDecker, M. 1966. *Mines of Eastern Sierra*, pp. 57. Glendale, CA: La Siesta Press.

[146] Nadeau, R. 1958. *Ghost Towns and Mining Camps of California*, pp. 88. Los Angeles, CA: The Ward Ritchie Press.

[147] Nadeau, R. 1958. *Ghost Towns and Mining Camps of* California, pp. 188. Los Angeles, CA: The Ward Ritchie Press.

[148] DeDecker, M. 1966. *Mines of Eastern Sierra*, pp. 62. Glendale, CA: La Siesta Press.

[149] DeDecker, M. 1966. *Mines of Eastern Sierra*, pp. 65. Glendale, CA: La Siesta Press.

Soda Products Manufacturing

Processing and manufacturing of soda minerals and compounds for industrial and commercial use in paint, glass, and detergent began at Owens Lake in the 1880s. In the 1950s, most of the world's production of borax was derived from Owens Lake, Searles Lake, and the Kramer borate mines.[150] The production of soda compounds, especially borax, has been influenced by world events: the First and Second World Wars brought about a rapid increase in domestic and world demand for soda minerals, corresponding in large price increases. This surge in demand for natural soda compounds forced plant owners to increase their capacities to meet both domestic and world demand.[151]

Inyo Development Company. The Inyo Development Company began production in 1885 in an area located approximately 1 mile northwest of the community of Keeler.[152] In 1899, the company expanded its operations to include soda ash production through a natural evaporation process.[153] The company's targeted markets were the glass, soap, and borax industries, for which the company maintained a sales agent in San Francisco. Assets included vacant lots and buildings, 3,000 acres of land, production vats, furnaces, pipelines, and manufacturing equipment, and payroll records indicate that the company employed between 20 to 150 workers.[154] At their height, the facilities produced 20 tons of soda ash per day, but by 1920, the company had dissolved and the plant was sold to the California Alkali Company.[155]

The Chemical Production Company. The Chemical Production Company began production in 1918, under the presidency of Lafayette M. Hughes. The plant was located approximately 9 miles south of Lone Pine, on the western shore of Owens Lake, and north of the California Alkali Company's plant. The company produced soda ash and was able to achieve a daily production rate of 20 tons per day. However, the company's process for manufacturing soda ash was a commercial failure and the plant closed within 2 months after starting operations.[156]

Natural Soda Products Company. In 1908, R.C. Paddock, Noah Wrinkle, and several other prominent investors formed the Natural Soda Products Company (NSPC).[157] The NSPC plant was located on the eastern shore of Owens Lake, approximately 2 miles south of the community of

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[150] Calef, W. 1951. The Salines of Southeastern California. *Economic Geography*, *27*(1): 43–64.

[151] Jones and Stokes. 2007. *Cultural Resources Inventory of Two Parcels in the Moat and Row Testing Area, Owens Lake Dust Mitigation Program, Inyo County, California*, pp. 16. Prepared for: City of Los Angeles Department of Water and Power.

[152] Jones and Stokes. 2007. *Cultural Resources Inventory of Two Parcels in the Moat and Row Testing Area, Owens Lake Dust Mitigation Program, Inyo County, California*, Figure 8. Prepared for: City of Los Angeles Department of Water and Power.

[153] University of Nevada, Reno. n.d. *A Guide to the Records of the Inyo Development Company*. Collection No. NC73. Special Collections Section, University of Nevada, Reno. Available at: http://www.library.unr.edu/specoll/mss/NC73.html

[154] University of Nevada, Reno. n.d. *A Guide to the Records of the Inyo Development Company*. Collection No. NC73. Special Collections Section, University of Nevada, Reno. Available at: http://www.library.unr.edu/specoll/mss/NC73.html

[155] Hamilton, F. 1920. *Seventeenth Annual Report of the State Mineralogist*. Volume XVII. California State Mining Bureau, Sacramento, CA.

[156] Hamilton, F. 1920. *Seventeenth Annual Report of the State Mineralogist*. Volume XVII. California State Mining Bureau, Sacramento, CA.

[157] *Owens Valley Herald Newspaper*. 25 December 1908. "New Soda Company Will Begin Manufacture of Many Products."

Keeler.[158] In 1912, the company was re-organized under the leadership of Bishop bankers Wilfred and Mark Watterson.[159] The NSPC facilities occupied both sides of the road which is now California State Highway 136; on the east side of the road was a processing mill, a mess hall, and barracks, and on the west side was the NSPC company town containing three dirt streets that housed the NSPC Hall and housings for the workers.[160] By 1920, the plant was producing bicarbonate of soda and soda ash with a daily output of around 120 tons per day, or roughly 10,000 tons of dense soda ash per year.[161] The processing technique developed by Herbert and Noah Wrinkle involved pumping lake water into large solar tanks, which yielded a concentrated solution. The plant employed a total of 100 workers.[162] Operations continued until January of 1953 when the corporation was dissolved.[163]

California Alkali Company. The California Alkali Company began continuous operations in September of 1917. The company's plant was located in Cartago near the Southern Pacific Railroad depot on the western shore of Owens Lake. The company, which employed 100 men, was owned by Mortimer Fleishhacker, president, and John F. Bush, vice president and general manager. Soda ash was produced by pouring lake water into clay vats and using solar evaporation to create concentrated brine. The plant's daily capacity was approximately100 tons of dense soda ash.[164]

A prohibition against the importation of German potash and soda ash was removed at the end of World War I. Small producers like the California Alkali Company could no longer compete against cheaper German-produced soda ash, and the plant was forced to close.[165] In 1924, the plant and its facilities were sold to the Inyo Chemical Company.[166]

The Inyo Chemical Company remodeled the plant and increased the production of soda ash and sodium bicarbonate. The company ceased using evaporation ponds and instead built wells into the playa and constructed a pipeline to pump brine back to the plant at Cartago.[167]

Pacific Alkali Company. The Pacific Alkali Company plant, located on the western shore of Owens Lake approximately 9 miles south of Lone Pine, began operations in 1930. Harvey S. Mudd was

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[158] Jones and Stokes. 2007. *Cultural Resources Inventory of Two Parcels in the Moat and Row Testing Area, Owens Lake Dust Mitigation Program, Inyo County, California*, Figure 8. Prepared for: City of Los Angeles Department of Water and Power.

[159] Kahrl, W. 1982. *Water and Power*, pp. 273-274. Berkeley, CA: University of California Press.

[160] O'Connell Family. 1995. *Desert Days: Living in the California Desert, 1914–1929*, pp. 32. North Hills, CA: Rock Ink.

[161] Hamilton, F. 1920. *Seventeenth Annual Report of the State Mineralogist*. Volume XVII. California State Mining Bureau, Sacramento, CA.

[162] Hamilton, F. 1920. *Seventeenth Annual Report of the State Mineralogist*. Volume XVII. California State Mining Bureau, Sacramento, CA.

[163] Natural Soda Products Company. 10 February 1953. *Certificate of Dissolution of Natural Soda Products Company*, pp. 3. Certificate filed in the Office of the Secretary of State of the State of California.

[164] Hamilton, F. 1920. *Seventeenth Annual Report of the State Mineralogist*. Volume XVII. California State Mining Bureau, Sacramento, CA.

[165] Pipkin, G. 1974. *Cartago, My Cartago*, pp. 2-3. Unpublished manuscript on file at the Eastern California Museum, Independence, CA.

[166] Jones and Stokes. 2007. *Cultural Resources Inventory of Two Parcels in the Moat and Row Testing Area, Owens Lake Dust Mitigation Program, Inyo County, California*, pp. 18. Prepared for: City of Los Angeles Department of Water and Power.

[167] Jones and Stokes. 2002b. *California Register of Historical Resources Evaluation of a Historic Pipeline at Cartago, California*. Prepared by: Jones and Stokes, Sacramento, CA. Prepared by: Jones and Stokes, Sacramento, CA. Prepared for: Los Angeles Department of Water and Power.

the company's president, George E. White was general manager, and George Dub was the plant's superintendent. The process used to produce soda ash consisted of pumping Owens Lake water through 2.5 miles of 14-inch pipe into evaporation ponds that ranged in size from 15 to 50 acres. The plant produced roughly 1,000 tons of soda and 2,000 tons of borax per year, and was powered by electricity provided by the Los Angeles Bureau of Power and Light. The plant employed roughly 50 men.[168] According to a manuscript by the Pittsburgh Plate Glass Company, the Columbia-Southern Chemical Corporation acquired the plant from the Pacific Alkali Company in 1944 and remodeled it in 1958.[169] The plant became part of the Pittsburgh Plate Glass Company and continued operations until the late 1970s.

Permanente Metals Corporation. After World War II, the demand for some mineral commodities fell, but the demand for soda ash increased. In 1947, the Permanente Metals Corporation, which later became Kaiser Aluminum and Chemical Corporation, finished the construction of a soda ash plant at Owens Lake. The plant was located about 7 miles south of Bartlett (between Bartlett and Cartago). The plant did not operate much in 1949, and was seldom used in 1950 when it finally closed.[170,171]

Saline Valley Salt Deposit

The salt deposits were located in the Saline Valley east of the Inyo Mountains, approximately 13 miles northeast of Swansea and 50 miles by dirt road from Keeler. The property was originally operated by the Saline Salt Company, formed in 1911 by White Smith, and continued to operate under that name until 1913. From 1915 to 1919, the deposit was operated by the Owens Valley Salt Company. From 1926 through 1930, the property was operated by Sierra Salt Corporation with G.W. Russell president, and A.S. Henderson the company's secretary.[172]

The salt was transported from the Saline Valley to the mill by an aerial tramway. The tramway was completed in 1913, and in 1929, the tramway was refurbished by the Sierra Salt Corporation and extended 13 miles to the Tramway Station.[173]

The Tramway Station was located northwest of Keeler adjacent to the Carson & Colorado Railroad siding, later operated by the Southern Pacific Railroad. The station included employee housing and a mill, which contained driers, vibrating screens, packing equipment and automated weight scales.[174] Due to high operating costs, the tramway ceased operations in 1933.[175]

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168 Bradey, W. 1938 *Thirty-fourth Annual Report of the State Mineralogist*. Volume XXXIV. California State Mining Bureau, Sacramento, CA.

169 Jones and Stokes. 1997. *Cultural Resources Inventory and Evaluation of Historic Resources on the Eastern Side of Owens Lake for the Great Basin Unified Air Pollution Control District*. Prepared by: Jones and Stokes, Sacramento, CA, pp. 19. Prepared for: Great Basin Unified Air Pollution Control District.

170 Mineral Information Services. 1959. "Soda Ash Industry of Owens Lake (1887-1959)." In *State of California Division of Mines*, Vol 12, No. 10.

171 Dub, G.D. 1947. "Owens Lake, California-Source of Sodium Minerals." In *American Institute of Mining and Metallurgical Engineers*. Industrial Mineral Division (Non Metallics). Vol 173. New York, NY: Institute at the Office of the Secretary.

172 Bradey, W. 1938 *Thirty-fourth Annual Report of the State Mineralogist*. Volume XXXIV. California State Mining Bureau, Sacramento, CA.

173 Bradey, W. 1938 *Thirty-fourth Annual Report of the State Mineralogist*. Volume XXXIV. California State Mining Bureau, Sacramento, CA.

174 Bradey, W. 1938 *Thirty-fourth Annual Report of the State Mineralogist*. Volume XXXIV. California State Mining Bureau, Sacramento, CA.

Sierra Talc Company

Formed in 1918 as the Inyo Talc Company, the company was renamed the Sierra Talc Company in 1919. The company built a mill in Keeler, which still stands today. The mill produced two types of high-grade talc, including talc for the newly emerging home electric appliance market. During World War II, the company was the country's largest producer of high-grade steatite talc for electric insulators. The company was the last industrial customer to use the narrow gauge railroad operated by the Southern Pacific Railroad. The company ceased operations in 1980 due to the lack of raw materials and to the logistical problems caused by the closure of the rail line at Keeler by the Southern Pacific Railroad.[176]

Transportation

Several distinct transportation industries, including trams, mule teams, boats, and railroads, played important roles in the industrial and economic histories of the Owens Lake region. The first three modes of transportation were needed to efficiently move raw materials and silver bullion to and from the Cerro Gordo mines. The fourth mode, the railroad, was not use intensively until the construction of the Los Angeles Aqueduct in the early 20th century.

Tramway

The Leschen Aerial tramway and its support facilities are located along California State Highway 136, 7 miles east of Lone Pine. The tramway was constructed in 1913 to bring salt from the Saline Valley over the Inyo Mountains to the eastern shore of Owens Lake, and later zinc ore from Cerro Gordo to Keeler. The electric-powered tram had an hourly capacity of 16 tons, and was 29,560 feet long from tower to tower. After 1920, the tram was used to bring limestone for the Natural Soda Product and Clark Chemical Plant at Bartlett. Later the tram was disassembled and sold to a Nevada firm, but was never used again.[177]

Mule Teams

In 1873, Mr. Belshaw, Mr. Beaudry, and Mr. Nadeau formed the Cerro Gordo Freight Company, with Nadeau receiving a 3-year contract from Belshaw and Beaudry to run the freight operations. The new company purchased 80 wagons, each of which was said to hold as much cargo as a narrow gauge railroad box car. Nadeau set up a chain of way-stations for the mule teams between Cartago and Los Angeles, and the round trip took approximately 3 weeks. The Cerro Gordo Freight Company dissolved in 1881.[178]

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[175] Jones and Stokes. 1997. *Cultural Resources Inventory and Evaluation of Historic Resources on the Eastern Side of Owens Lake for the Great Basin Unified Air Pollution Control District*. Prepared by: Jones and Stokes, Sacramento, CA, pp. 19. Prepared for: Great Basin Unified Air Pollution Control District.

[176] Jones and Stokes. 1997. *Cultural Resources Inventory and Evaluation of Historic Resources on the Eastern Side of Owens Lake for the Great Basin Unified Air Pollution Control District*. Prepared by: Jones and Stokes, Sacramento, CA, pp. 20. Prepared for: Great Basin Unified Air Pollution Control District.

[177] DeDecker, M. 1966. *Mines of Eastern Sierra*, pp. 65. Glendale, CA: La Siesta Press.

[178] Chalfant, W.A. 1933. *The Story of Inyo*, pp. 312. Bishop, CA: Chalfant Press.

Steamboats

James Brady, the superintendent of the Owens Lake Silver-Lead Company at Swansea and a competitor of the Consolidated Union mine's Mr. Belshaw, came up with the idea of using a steamer to ferry silver bullion from Swansea to the town of Cartago. On June 27, 1872, the steamer *Bessie Brady* (named after Brady's daughter) made her maiden voyage carrying 700 bars of silver to Daneri's landing, later renamed Cartago. The new steamer took 3 days off the shipment time for bullion from Swansea to Cartago. The steamer was a financial success for many years, even though James Brady sold his interest in the Owens Lake Silver-Lead Company long before the steamer was able to generate large profits for the company. In 1873, *Bessie Brady* was sold to the Cerro Gordo Freight Company and moved to the newly constructed wharf at Keeler.[179]

In 1873, Colonel Sherman Stevens constructed a flume at Cottonwood Canyon, west of Owens Lake. By 1876, it was incorporated into the Inyo Lumber & Coal Company and flume was extended onto the Owens Lake shoreline. The company built its own steamer, named the *Mollie Stevens* after Colonel Stevens's daughter, in 1877. Smaller than the *Bessie Brady*, the *Mollie Stevens* made her maiden voyage in June of that year carrying 30,000 feet of lumber for the Union Consolidated Company.[180] However, with the decline of mining activities at Cerro Gordo the following year, the *Molly Stevens* was moored at Ferguson's Landing and her engine was removed and sent to the *Bessie Brady*.[181] In 1882, while she was being refurbished and refitted with the *Molly Stevens'* engine, a fire broke out and engulfed the *Bessie Brady*. The steamer was a total loss.[182]

The Carson & Colorado Railroad

The Carson & Colorado Railroad was originally constructed to connect the Virginia & Truckee Railroad Company (V&T) with the Central Pacific Railroad at Reno, Nevada. The owners of the V&T wanted to expand the line south to take advantage of the mining boom along the eastern Sierras from the Candelaria Mountains to Owens Lake. In 1880, financed by D.O. Mills, William Ralston, and William Sharon from San Francisco, the line was extended from Mound House near Carson City, Nevada to Keeler.[183] To save money, the financiers had a narrow gauge rail line constructed on the eastern side of the Sierras where the terrain was relatively flat. This line was completed to Keeler in 1883, and was known as the "Slim Princess" by the residents of the valley.[184]

The Carson & Colorado Railroad Company's owners had hoped to complete the line to Mojave, but this was never realized. The Carson & Colorado Railroad Company controlled the line until its sale to the Southern Pacific on March 1, 1900. The narrow gauge line ran until 1911, when the Southern Pacific completed its line from Mojave to Owenyo.[185]

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179 DeDecker, M. 1966. *Mines of Eastern Sierra*, pp. 59. Glendale, CA: La Siesta Press.

180 DeDecker, M. 1966. *Mines of Eastern Sierra*, pp. 61. Glendale, CA: La Siesta Press.

181 Ligenenfelter, R. 1962. 'The Desert Steamers." *Journal of the West*, *1*(2).

182 Ligenenfelter, R. 1962. 'The Desert Steamers." *Journal of the West*, *1*(2).

183 Due, J. 1951. "The Carson and Colorado Railroad." *Economic Geography*, *27*(3): 251–267.

184 Kahrl, W. 1982. *Water and Power*, pp. 38. Berkeley, CA: University of California Press.

185 Due, J. 1951. "The Carson and Colorado Railroad." *Economic Geography*, *27*(3): 251–267.

Southern Pacific Railroad

The Southern Pacific Railroad purchased the narrow gauge line from the Carson & Colorado Railroad Company in 1900. The purchase started rumors in Los Angeles that the Southern Pacific would extend its line from Mojave to the Owens Valley, but due to poor economic conditions in the mining industry, the railroad instead extended its line west and connected Mojave with Bakersfield.[186] In 1907, the City of Los Angeles chose the Southern Pacific Railroad to build a line from Mojave to Owenyo, and to transport materials from Mojave to the Owens Valley for the City's planned aqueduct system. The Southern Pacific's bid to build the line was not the lowest, but the railroad was chosen because it controlled the right-of-way on land needed by the City to construct its aqueduct. In return for the contract, Southern Pacific offered the land to the City for 5 dollars an acre. The line shipped over a million tons of freight from Mojave to Owenyo during the construction of the aqueduct.[187] Eventually the freight traffic dropped as agricultural shipments from the Owens Valley were reduced due both to water being siphoned off from the Owens River and to the construction of U.S. Highway 395.

Los Angeles Aqueduct

In 1904 through May 1905, the City of Los Angeles began to acquire land and water rights in Owens Valley. In 1907, the voters of Los Angeles approved a bond measure to build an aqueduct system that would divert water from the Owens River to Los Angeles.[188] The water from the Owens River was needed by the City's growing population, which had reached 100,000 by 1900.[189]

Beginning in 1908, William B. Mulholland, chief engineer and later the superintendent of the Department of Water and Power for the City of Los Angeles, designed and supervised the construction of the Los Angeles Aqueduct. Workers' camps along the construction route brought temporary economic and population increases to the Owens Valley and to the small towns that dotted the route. In 1913, the aqueduct was completed.[190]

In the 1920s, drought and Los Angeles' rapidly growing population made increasing demands on water supplies, forcing the City to begin purchasing entire farms and ranches in the Owens Valley. The City constructed wells to pump the water from the aquifers below the valley's surface directly into the aqueduct system. The results of this action had a negative effect on the valley's economy, both in terms of agriculture and commerce. In the early 1920s, the aqueduct system was the target of periodic public protests and vandalism, including the dynamiting of aqueduct assets.[191] To defuse the protests and stabilize the economy, the City of Los Angeles developed a lease back program to farmers and ranchers. By 1927, the City had leased back approximately 70 percent of their land holdings in the Owens Valley.[192]

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[186] Kahrl, W. 1982. *Water and Power*, pp. 37. Berkeley, CA: University of California Press.

[187] Kahrl, W. 1982. *Water and Power*, pp. 152. Berkeley, CA: University of California Press.

[188] Smith, D. 1 December 1974. "70-Year Water Dispute: Fact, Fable Hard to Separate." *Los Angeles Times*.

[189] Hundley, N. 2001. *The Great Thirst: Californians and Water: A History*, pp. 141. Los Angeles, CA: University of California Press.

[190] Kahrl, W. 1982. *Water and Power*, pp. 158-161. Berkeley, CA: University of California Press.

[191] Hundley, N. 2001. *The Great Thirst: Californians and Water: A History*, pp. 165. Los Angeles, CA: University of California Press.

[192] *Los Angeles Times*. 17 June 1928. "Owens Valley Farming Grows."

The diversion of water from the Owens River by the Los Angeles Aqueduct coupled with the high level of evaporation to cause a rapid drop in the water level of Owens Lake. By 1930, the lake was virtually dry, resulting in the exposure of large deposits of solids salts, brines, and other minerals along the playa.

5.3.2 Cultural Resources Characterization

5.3.2.1 Previous Archaeological Research Conducted in the Owens Valley

Archaeological investigations in the Owens Valley began with works aimed at studying the Owens Valley Paiute. One of the earliest works is that by Mallery,[193,194] who made a recording of petroglyphs in the Owens Valley in the late 1800s. During the 1930s, Steward conducted ethnographic studies among this group and reported an archaeological site northwest of Keeler.[195] Throughout the 1940s and 1950s, several studies were carried out in the region. Elizabeth and William H. Campbell worked along the shore lines of dry lakes in Southern California, and recorded two sites near the Owens Lake shoreline.[196] Harry and Francis Riddell recorded several sites on the periphery of the lake, specifically on the east and west shoreline, and near the delta area.[197,198,199]

Some of the work conducted during the 1950s and 1960s greatly contributed to the development of regional chronologies, and thus to the understanding of the area's prehistory. H. Riddell[200] performed excavations at the Cottonwood Creek Site (CA-INY-2), which is located just west of Owens Lake on Cottonwood Creek. CA-INY-2 is the type site for the Cottonwood series projectile points and the Owens Valley brown ware.[201] Cultural materials recovered from this site include protohistoric and historic artifacts, suggesting a Paiute village active during historic times. The Rose Spring site, CA-INY-372, located about 10 miles south of Olancha on the south end of the lake, was excavated by the Riddells, and their work was compiled and published by Lanning.[202] CA-INY-372 is the site type for the Rose Spring series projectile points. Among the contributions of Lanning's works is his attempt to provide evidence of material culture change through time. More

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[193] Mallery, G. 1886. "Pictographs of the North American Indians: A Preliminary Paper." In *Fourth Annual Report of the Bureau of Ethnology to the Secretary of the Smithsonian Institution: 1882–1883*, Director J. W. Powell, pp. 30–33. Washington, DC: Government Printing Office.

[194] Mallery, G. 1972. *Picture-Writing of the American Indians: Vol. 1*, pp. 52–71. New York, NY: Dover Publications, Inc.

[195] Steward, J.H. 1933. "Ethnography of the Owens Valley Paiute." *University of California Publications in American Archaeology and Ethnology*, *33*(3): 233–350.

[196] Campbell, E.W.C. 1949. "Two Ancient Archaeological Sites in the Great Basin." *Science*, *109*(2831): 340.

[197] Riddell, F.A. 1958. "The Eastern California Border: Cultural and Temporal Affinities." *Reports of the University of California Archaeological Survey*, *42*: 41–48.

[198] Riddell, H.S., Jr. 1951. "The Archaeology of a Paiute Village Site in Owens Valley." *Reports of the University of California Archaeological Survey*, *12*(15): 14–28.

[199] Riddell, H.S., Jr., and Riddell, F.A. 1956. "The Current Status of Archaeological Investigations in Owens Valley, California." *Reports of the University of California Archaeological Survey*, *33*(38): 28–33.

[200] Riddell, H.S., Jr. 1951. "The Archaeology of a Paiute Village Site in Owens Valley." *Reports of the University of California Archaeological Survey*, *12*(15): 14–28.

[201] Riddell, H.S., Jr. 1951. "The Archaeology of a Paiute Village Site in Owens Valley." *Reports of the University of California Archaeological Survey*, *12*(15): 14–28.

[202] Lanning, E.P. 1963. "The Archeology of Rose Spring Site Iny-372." *University of California Publications in American Archaeology and Ethnology*, *49*(3): 237–336.

recent investigations at CA-INY-372 by Yohe[203,204,205] have contributed to a refinement of the regional chronology and a better understanding of the introduction of bow and arrow technology in eastern California. Excavations at the Stahl site (CA-INY-182) between 1948 and 1951 by Mark Harrington were published in 1957.[206] CA-INY-182 is located near Little Lake, about 13 miles south of the Rose Spring site. Investigations at this site have greatly contributed to the interpretations of Mojave Desert archaeology.

During the 1970s, Bettinger's work in the Owens Valley began and has resulted in various publications.[207,208,209,210] Combined with information from different studies, Bettinger has addressed important issues about regional adaptations.

Investigations in the Owens Valley area since the 1970s until present times have largely been the result of contract work generated by various projects that are required to comply with current state and federal laws and regulations. The cultural resources technical reports generated throughout the years include archaeological surveys, as well as testing and data recovery of prehistoric and historic archaeological resources, located adjacent to or within the Owens Lake bed. The outcomes of these reports have been addressed in a large number of environmental documents. These have been summarized in the 2003 and 2008 Environmental Impact Reports (EIRs) prepared in support of the Owens Lake PM_{10} Planning Area Demonstration of Attainment State Implementation Plan (SIP).[211,212] In recent years, much of the work has been in support of the implementation of DCMs in the lake.[213,214,215]

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[203] Yohe, R.M., II. 1992. *A Reevaluation of Western Great Basin Cultural Chronology and Evidence for the Timing and Introduction of the Bow and Arrow to Eastern California Based on New Excavations at the Rose Spring Site (CA-INY-372)*. PhD Dissertation, University of California, Riverside.

[204] Yohe, R.M., II. 1992. *A Reevaluation of Western Great Basin Cultural Chronology and Evidence for the Timing and Introduction of the Bow and Arrow to Eastern California Based on New Excavations at the Rose Spring Site (CA-INY-372)*. PhD Dissertation, University of California, Riverside.

[205] Yohe, R.M. 2000. "'Rosegate' Revisited: Rose Spring Point Temporal Range in the Southwestern Great Basin." In *Archaeological Passages: A Volume in Honor of Claude Nelson Warren*, ed. by J.S. Schneider, R.M. Yohe, II, and J.K. Fardnet, pp. 213–224. Western Center for California Archaeology and Paleontology Publications in Archaeology No. 1, Hemet, CA.

[206] Harrington, M.R. 1957. "A Pinto Site at Little Lake, California." *Southwest Museum Papers*, *17*. Los Angeles, CA.

[207] Bettinger, R.L. 1975. "The Surface Archaeology of Owens Valley, Eastern California: Prehistoric Man-Land Relationships in the Great Basin." PhD diss., University of California, Riverside, Department of Anthropology.

[208] Bettinger, R.L. 1977. "Aboriginal Human Ecology in Owens Valley, Eastern California: Prehistoric Change in the Great Basin." *American Antiquity*, *43*: 3–17.

[209] Bettinger, R.L. 1982a. "Aboriginal Exchange and Territoriality in Owens Valley, California." In *Context for Prehistoric Exchange*, ed. J.E. Ericson and T.K. Earle, pp.103–127. New York: Academic Press

[210] Bettinger, R.L. 1982b. "Aboriginal Sociopolitical Organization in the in Owens Valley: Beyond the Family Band." In *The Development of Political Organization in Native North America*, ed. E. Tooker and M.H. Fried, pp 45–58. *Proceedings of the American Ethnological Society*. Washington, DC

[211] Great Basin Unified Air Pollution Control District (District). 2003. *2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Environmental Impact Report*. Prepared for: Great Basin Unified Air Pollution Control District. Prepared by: Sapphos Environmental, Inc.

[212] Great Basin Unified Air Pollution Control District (District). 2008. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Environmental Impact Report*. Prepared for: Great Basin Unified Air Pollution Control District. Prepared by: Sapphos Environmental, Inc.

[213] Sapphos Environmental, Inc., 2008. 2008 *Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan, Final Cultural Resources Technical Report*. Prepared for: Great Basin Unified Air Pollution Control District. Prepared by: Sapphos Environmental, Inc.

5.3.2.2 *Previous Archaeological Research in the Cultural Resource Study Area*

The Class I existing information inventory indicates that 11 archaeological surveys have been previously conducted for cultural resources within the cultural resources study area. Brief descriptions of the surveys are provided below (Table 5.3.2.2-1, *Previously Surveyed Areas in Class I Cultural Resources Study Area*; locations are shown in Figure B-1, *Previously Surveyed Areas in Class I Cultural Resources Study Area*, in Appendix B, Confidential Archaeological Information: Maps.

TABLE 5.3.2.2-1
PREVIOUSLY SURVEYED AREAS IN CLASS I CULTURAL RESOURCES STUDY AREA

Report No.	Year	Report Title	Author
IN-00063	1978	California Desert Program – Archaeological Sample Unit Records for Owens Valley Planning Unit	BLM
IN-00293	2003	Cultural Resource Survey for 2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan, Vols. I and II	Wells, Helen, Ancient Enterprises, Inc., Santa Monica, CA, for Sapphos Environmental, Inc., Pasadena, CA
IN-00563	1997	Cultural Resources Inventory and Evaluation of the Historic Resources on the Eastern Side of Owens Lake for the Great Basin Unified Air Pollution Control District	Jones and Stokes Associates
IN-00592	2002	Inventory and Evaluation of 18 Sites on the Eastern Margin of the Owens Lake Playa, Inyo County, California	Jones and Stokes Associates
IN-00639	2004	Cultural Resources Inventory Report	McCormick, Erica D., BLM, Bishop, CA
IN-00641	2002	Archaeological Survey Report for a Monument on State Route 136, Inyo County, California	Jones and Stokes Associates
IN-00642	2005	Cultural Resources Inventory of a Proposed Temporary Road at Swansea, Inyo County, California	Burton, Jeffry F., Trans-Sierran Archaeological Research
IN-00658	2003	Research Design for Limited Phase II Testing at the Keeler Dunes Sites, Owens Valley, California	Halford, F. Kirk, BLM, Bishop, CA
IN-00735	2005	Results of Limited Phase II Testing at the Keeler Dunes Sites, Owens Valley, California	Halford, F. Kirk, and Kim Carpenter, Far Western Anthropological Research Group, Inc.
IN-00834	2008	Cultural Resources Inventory Report	Haverstock, Greg, BLM, Bishop, CA
IN-00928	2010	Cultural Resources Inventory of Caltrans District 9 Rural Conventional Highways in Inyo, Eastern Kern, Mono, and Northern San Bernardino Counties	Seil, Libby, Bryan Larson, Joseph Freeman, Jill Braden, Lindsay Hartman, Laura Leach-Palm, Paul Brandy, and Jay King, Far Western Anthropological Research Group, Inc.

[214] Jones and Stokes. 2008. *Archaeological Testing and Evaluation of Sites in Phase 7 of the Owens Lake Dust Mitigation Program, Inyo County, California*. Prepared for Los Angeles Department of Water and Power, Los Angeles, California. (EIC Report No. IN-00857).

[215] Garcia and Associates. 2011. *Cultural Resources Survey Report for the Owens Lake Dust Control Program, Phase 7a Project, Owens Lake, California*. Report prepared for MWH, and Los Angeles Department of Water and Power, Los Angeles, California.

IN-00063. This project involved a Class II survey of Bureau of Land Management (BLM) land within the Owens Valley for the California Desert Program. As part of this work effort, a reconnaissance survey was completed in 1978 by BLM archaeologists in Section 13, Township 16 South, Range 37 East. One archaeological site, a prehistoric lithic quarry, was recorded during the survey. The cultural resource is located outside of the proposed project's cultural resources study area.

IN-00293. In 2003, an archaeological literature search and survey were conducted in support of the 2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan. The examination included a sample survey of approximately 4,400 acres of the Owens Lake bed. A total of 31 archaeological sites, 3 historic resources, a portion of the Natural Soda Products historic district (previously recorded), and 46 isolates were discovered during this survey. Twenty-three archaeological sites, 2 historic resources, part of the Natural Soda Products historic district, and 33 isolates were found to be within that project's APE. Phase II investigations were recommended to reduce the impacts to below the level of significance.

IN-00563. In 1997, Jones and Stokes Associates conducted an archaeological resources inventory, prepared a historic contextual study, and documented and evaluated large-scale historic resources that may be affected by the implementation of dust mitigation measures in the Owens Lake study area, Owens Valley, Inyo County, California. A survey was conducted on 1,900 acres of a 24,960-acre proposed project area. A total of 19 isolated artifacts and 1 prehistoric site were discovered during field reconnaissance. It was recommended that additional research and testing be conducted in the area of the prehistoric site prior to any ground disturbance. It was also recommended that that the historic Natural Soda Products Company be considered eligible for listing on the National Register of Historic Places (NRHP) and California Register of Historical Resources (CRHR) as a historic district.

IN-00592. In 2002, Jones and Stokes Associates located 18 prehistoric archaeological sites during the monitoring of LADWP's construction activities on the North Sand Sheet of Owens Lake. These sites were subsequently tested and evaluated for CRHR eligibility. Results of the testing program indicate that on an individual basis, none of the sites could be considered significant as defined by CEQA. However, it was determined that the collective assemblage of data from the sites could contribute to regional research questions.

IN-00639. In 2004, a Class I records search and Class III intensive pedestrian survey were conducted by Bishop BLM Field Office archaeologists on a 2-acre parcel of land located west of California State Highway 136. This work was prompted by the unauthorized construction of a road through BLM land. The records search indicated that there were no sites recorded within 0.5 mile of the survey area. No cultural resources were encountered during the pedestrian survey.

IN-00641. In 2002, an archaeological survey was conducted on 3.67 acres of land for a proposed monument on California State Highway 136. No cultural resources were identified as a result of this survey. A recommendation was made that in the event that buried cultural resources were encountered during project construction, work should be halted in that area until a qualified archaeologist could determine the significance of the find. It was also recommended that in the event human bone is discovered, the County coroner and Native American Heritage Commission (NAHC) should be contacted immediately.

IN-00642. In 2005, Trans-Sierran Archaeological Research conducted a cultural resources survey of a 91-acre area of BLM land east of Owens Lake. The survey was prompted at the request of

Barnard Construction, Inc., who proposed to build a temporary road to access quarry locales south of the community of Swansea. Two historic period sites, the Carson & Colorado Railroad and the Owens Lake Silver-Lead Company's mill and smelter, were recorded in the project area; two prehistoric lithic scatters were also located during the survey. Three of the four archaeological sites were considered eligible for listing on the NRHP. It was recommended that the project should be designed to avoid these resources. If avoidance were not possible, then mitigation was recommended.

IN-00658. In 2003, a research design was developed by the Bishop BLM Field Office archaeologist and the Far Western Archaeological Research Group, Inc. to evaluate the presence of human remains at two prehistoric sites (CA-INY-6502/P-14-7840 and CA-INY-6503/P-14-7841) on BLM and LADWP land in the southern portion of the Keeler Dunes; these sites are located within the current proposed project's APE. The proposed Phase II test excavations would investigate whether cairn features located at the sites were used to mark prehistoric burials. The research design provided a summary of the past cultural resources work conducted in the Keeler Dunes area and discussed the excavation and laboratory methods that would be used in the proposed study.

IN-00735. In 2003, BLM archaeologists and the Far Western Anthropological Research Group, Inc., conducted Phase II test excavations at two prehistoric sites (CA-INY-6502/P-14-7840 and CA-INY-6503/P-14-7841) on BLM and LADWP land in the southern portion of the Keeler Dunes; these sites are located within the current proposed project's APE. The purpose of this work was to determine if cairn features at the sites were used mark the locations of prehistoric burials. No human remains were identified during the excavation of six cairns at CA-INY-6502/P-14-7840, and a single human burial was found in a cairn feature at CA-INY-6503/P-14-7841. At the request of the Lone Pine Tribal Council, no further Phase II investigations were conducted at the two sites.

IN-00834. In 2008, BLM archaeologists conducted a Class I inventory and Class III surveys of 10 proposed environmental monitoring sites for the District. No cultural resources were located within or near the APE. It was recommended the monitoring sites be accessed in ways that would avoid previously documented archaeological sites in the area. In addition, it was recommended that if previously unidentified cultural resources were discovered during the project, that construction work should halt and the BLM archaeologist should be notified.

IN-00928. Between 2007 and 2009, Far Western Anthropological Research Group, Inc. conducted a cultural resources inventory of rural conventional highways in Inyo, Mono, and eastern Kern counties for the California Department of Transportation (Caltrans). The project included a Class I inventory and Class III surveys of Caltrans right-of-way for 19 state highway routes. A total of 226 cultural resources were found partially or completely within the right-of-way during the survey.

5.3.2.3 Known Prehistoric Archaeological Resources in the Cultural Resources Study Area

A total of 27 prehistoric cultural resources have been recorded in the study area, including 22 archaeological sites and five isolates (Table 5.3.2.3-1, *Previously Recorded Prehistoric Archaeological Sites and Isolates Located in the Cultural Resources Study Area*); the location of these prehistoric sites and isolates are shown in Figure B-2, *Previously Recorded Archaeological Sites and Historic Buildings and Structures in Class I Cultural Resources Study Area*; and Figure B-3, *Previously Recorded Archaeological Isolates in Class I Cultural Resources Study Area*, respectively (Appendix B). The prehistoric sites consist of artifact scatters, cairns, rock rings, quarry complexes, bedrock mortars, and petroglyphs. Prehistoric isolates were exclusively composed of single or small numbers of flaked stone artifacts.

TABLE 5.3.2.3-1
PREVIOUSLY RECORDED PREHISTORIC ARCHAEOLOGICAL SITES AND ISOLATES LOCATED IN THE CULTURAL RESOURCES STUDY AREA

Primary No.	Trinomial	Resource Type	Description	Within APE	Within Project Area	Within 1 Mile
P-14-273	CA-INY-273	Site	Artifact scatter			X
P-14-320	CA-INY-320	Site	Ceramic and lithic scatter			X
P-14-321	CA-INY-321	Site	Artifact scatter			X
P-14-432	CA-INY-432	Site	Petroglyph with bedrock mortar			X
P-14-451	CA-INY-451	Site	Artifact scatter			X
P-14-452	CA-INY-452	Site	Flaked and ground stone scatter			X
P-14-5927		Isolate	4 lithic flakes			X
P-14-7147	CA-INY-6076	Site	Lithic scatter			X
P-14-7148	CA-INY-6077	Site	Lithic scatter			X
P-14-7567	CA-INY-6361	Site	Lithic and ground stone scatter			X
P-14-7568	CA-INY-6362	Site	Basalt quarry complex			X
P-14-7570	CA-INY-6364	Site	Lithic scatter			X
P-14-7571	CA-INY-6365	Site	Lithic scatter and rock ring feature			X
P-14-7572	CA-INY-6366	Site	Lithic and ground stone scatter			X
P-14-7573	CA-INY-6367	Site	Lithic scatter			X
P-14-7603		Isolate	Small lithic scatter			X
P-14-7604		Isolate	Obsidian scraper			X
P-14-7605		Isolate	Obsidian scraper			X
P-14-7606		Isolate	Three pieces of obsidian debitage			X
P-14-7840	**CA-INY-6503**	**Site**	**Rock cairns with associated prehistoric and historic artifact scatters**	**X**	**X**	
P-14-7841	**CA-INY-6502**	**Site**	**Rock cairns with associated prehistoric and historic artifact scatters**	**X**	**X**	
P-14-7842	CA-INY-6504	Site	Lithic and ground stone scatter			X
P-14-7843	CA-INY-6505	Site	Rock cairns with associated prehistoric and historic artifact scatters			X
P-14-8281	CA-INY-6599	Site	Lithic scatter			X
P-14-8419	CA-INY-6659	Site	Lithic scatter			X
P-14-8420	CA-INY-6660	Site	Lithic scatter			X
P-14-10344		Site	Lithic scatter			X

NOTE: P-15-7840/CA-INY-6503 and P-14-7841/CA-INY-6502 are now considered one cultural resource (CA-INY-6502).

Only two prehistoric archaeological sites, P-14-7840/CA-INY-6503 and P-14-7841/CA-INY-6502, are located within the proposed project / proposed action area. The sites are situated near a freshwater spring on lands administered by the BLM and LADWP. Recorded in 2003 as part of a cultural resource survey for the LADWP Keeler Dunes Mining project, the remains consist of concentrations of rock cairns that are surrounded by a diffuse flaked stone scatter; several cairns had associated artifact assemblages that contained flaked and ground stone tools, pottery, shell, and animal bone.[216] A small number of historic artifacts were also noted at the two sites including a bullet, bottle glass fragments, clothing debris, and butchered animal bone; these remains range in date from the late 1800s to modern times.

Following their initial recording, limited Phase II testing was completed on the cairn features at CA-INY-6502 and CA-INY-6503 by BLM and Far Western Anthropological Research Group, Inc. (Far Western).[217] Given the form of the cairns and their associated artifacts, it was originally postulated that the features may mark human burials. To determine if the cairns were used as grave markers, seven rock piles were excavated at the sites (six at CA-INY-6502 and one at CA-INY-6503). Only one cairn at CA-INY-6503 was found to be in direct association with human remains. Archaeological work at the sites was halted in response to the discovery of the human remains and concerns by local Native American groups. Due to their cultural and archaeological value, both sites were determined to be eligible for listing under Criterion D on the NRHP.[218]

Sand movement within the Keeler Dunes area since 2003 has revealed additional archaeological deposits associated with CA-INY-6502 and CA-INY-6503. The exposure of these previously undocumented cultural remains prompted a revisit to the sites in 2009 by BLM archaeologist Mr. Greg Haverstock.[219] An additional 63 cairn features, which were concentrated in several discrete loci, were identified in the dune complex during the revisit. As a result of these findings, the site boundaries of CA-INY-6502 and CA-INY-6503 were expanded and merged into one large site (therein referred to as CA-INY-6502) (Figure B-2). During subsequent visits to the site, Mr. Haverstock noted cremated and articulated human skeletal remains eroding out of the dune complex, suggesting that the site was used as a prehistoric mortuary location. Mr. Haverstock has hypothesized that CA-INY-6502 may be part of a series of such mortuary sites that line the prehistoric shore of Owens Lake, collectively referred to as the Southern Owens Valley Mortuary Complex.[220] This complex also includes the site of P-14-7843/CA-INY-6505, which is located just outside of the proposed project / proposed action area (Figure B-2).

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[216] Halford, F. Kirk and Kim Carpenter. 2005. *Results of Limited Phase II Testing at the Keeler Dunes Sites, Owens Valley, California*. Cultural Resource Project: CA-170-03-11. Report prepared by Far Western Anthropological Research Group, Inc., Davis, CA.

[217] Halford, F. Kirk and Kim Carpenter. 2005. *Results of Limited Phase II Testing at the Keeler Dunes Sites, Owens Valley, California*. Cultural Resource Project: CA-170-03-11. Report prepared by Far Western Anthropological Research Group, Inc., Davis, CA.

[218] Halford, F. Kirk and Kim Carpenter. 2005. *Results of Limited Phase II Testing at the Keeler Dunes Sites, Owens Valley, California*, pp. 1. Cultural Resource Project: CA-170-03-11. Report prepared by Far Western Anthropological Research Group, Inc., Davis, CA.

[219] Primary Site Record for CA-INY-6502 and CA-INY-6503 (Update). Record on file at the Bureau of Land Management, Bishop Field Office, Bishop, California.

[220] Haverstock, Greg. March 17-20, 2010. Stones and Bones: The Southern Owens Valley Mortuary Complex. Paper presented at the Society for California Archaeology, 2010 Annual Meeting. Riverside, CA.

5.3.2.4 *Known Historic Archaeological and Built Environment Resources in the Study Area*

Previously recorded archaeological and built environment resources dating to the historic period have also been identified within the cultural resources study area (Table 5.3.2.4-1, *Previously Record Historic Resources Located in the Cultural Resources Study Area*; and Figure B-2). Five historic period archaeological sites have been documented in the vicinity of Keeler Dunes, including: two segments of the Carson & Colorado Railroad line (P-14-5194/CA-INY-5058H and P-14-7851/CA-INY-6513H), an Owens Lake Silver-Lead Company mill and smelter facility (P-14-4822/CA-INY-6661H), the Swansea pier (P-14-8385/CA-INY-6658H), and a section of a utility line (P-14-7569/CA-INY-6363H). The southern portion of one of these sites, the Owens Lake Silver-Lead Company mill and smelter facility, is located within the proposed project / proposed action area (see Figure B-2). Two built environment resources are also recorded in the proposed project / proposed action vicinity: a three-story standing building that is part of the Sierra Talc Mill (P-14-4820/CA-INY-4820H) in Keeler and the remains of an Owens Lake Silver-Lead Company furnace (P-14-4822/CA-INY-4822H) in Swansea. Neither of these cultural resources is located in the proposed project / proposed action area.

The five historic period isolates include a section of pipe, broken glass bottles, a metal horseshoe, and a ceramic fragment (Table 5.3.2.4-1 and Figure B-3). Only one historic isolate, a broken glass bottle (P-14-7852), is located within the proposed project / proposed action area.

TABLE 5.3.2.4-1
PREVIOUSLY RECORDED HISTORIC RESOURCES LOCATED IN THE CULTURAL RESOURCES STUDY AREA

Primary No.	Trinomial	Resource Type	Description	Within APE	Within Project Area	Within 1 Mile
P-14-5194	CA-INY-5058H	Site	"End of Line" of the Carson & Colorado Railroad			X
P-14-5926		Isolate	Section of pipeline			X
P-14-7569	CA-INY-6363H	Site	Utility line			X
P-14-7608		Isolate	Glass bottle fragment			X
P-14-7640		Isolate	Metal horseshoe			X
P-14-7641		Isolate	Ceramic fragment			X
P-14-7851	CA-INY-6513H	Site	Carson & Colorado Railroad			X
P-14-7852		Isolate	Broken glass bottle		X	
P-14-8385	CA-INY-6658H	Site	Swansea Pier			X
P-14-4820	CA-INY-4820H	Building	Sierra Talc Mill			X
P-14-4822	CA-INY-4822H	Furnace	Owens Lake Silver-Lead Company furnace			X
P-14-8421	CA-INY-6661H	Site	Owens Lake Silver-Lead Company mill and smelter		X	

5.3.2.5 Newly Recorded Archaeological Resources in the Cultural Resources Study Area

Newly Recorded Archaeological Resources

Four newly recorded archaeological sites and seventeen archaeological isolates were documented in the proposed project / proposed action area. These include a sparse lithic scatter (BLM Site 1), a multicomponent artifact concentration (KD Site 1), a section of Old State Highway (KD Site 2), and a previously undocumented section of the Carson & Colorado Railroad (P-14-7851/CA-INY-6513H). Portions of all four sites are located in the southwestern portion of the proposed project / proposed action area within the defined APE. Descriptions and evaluations of each cultural resource are provided below; the locations of the archaeological sites and isolates are shown in Figure B-4, *Locations of Newly Recorded Archaeological Resources in Project Area* (Appendix B). DPR forms of the three sites are provided in Appendix C, *Confidential Archaeological Information: DPR 523 Forms*.

BLM Site 1. This site is a small prehistoric lithic scatter located within the southern buffer of Staging Area 3. It is composed of a few fragments of flaked stone and two cores and measures approximately 3 meters in diameter. The site was recorded by Mr. Greg Haverstock during field surveys conducted on February 20, 2014 and information regarding the resource is on file at the Bureau of Land Management, Bishop Field Office. Based upon surficial deposits, BLM Site 1 is not recommended eligible for listing in the NRHP or CRHR.

KD Site 1. This multicomponent site is situated along the western edge of the APE within the southwestern corner of the proposed project / proposed action area west of the Old State Highway (Figure B-4). It measures approximately 775 feet by 400 feet and consists of six historic period artifact concentrations, a historic road alignment, and two possible prehistoric cairns (Figure 5.3.2.5-1, *Map of KD Site 1*). The site is situated on a sand sheet which overlies alluvial deposits and is bounded on the north and east by active dune deposits (Image 5.3.2.5-1, *Overview of Artifact Concentration 2 at KD Site 1, Looking Northeast*).

FIGURE REMOVED FOR CONFIDENTIALITY

IMAGE REMOVED FOR CONFIDENTIALITY

Image 5.3.2.5-1. Overview of Artifact Concentration 2 at KD Site 1, Looking Northeast

Artifact Concentration 1 (AC 1). This historic period artifact concentration measures 120 feet by 150 feet and is located immediately south of an abandoned dirt road in the central portion of the KD Site 1. The large and dense artifact concentration is composed of a number of discrete trash deposits that are situated in close proximity to one another. During the field recordation of AC 1, the trash scatter was subdivided into nine loci which roughly approximate the clustering of artifacts within the concentration (Figure 5.3.2.5-2, *Schematic of Artifact Loci Locations within AC 1*). In total, AC 1 is estimated to contain over 7,400 artifacts (Table 5.3.2.5-1, *Estimates of Artifacts by Type at KD Site 1*). Most of these remains ($n = 6{,}600$) consist of small unidentified fragments of highly corroded metal. The lack of preservation of metal artifacts at KD Site 1 can be attributed to the highly alkaline soils that characterize the Owens Lake area. Though many metal artifacts were too poorly preserved to be identified, as discussed in more detail below, a small number of metal food cans and other containers were recorded in AC 1.

Culinary-related artifacts comprise the majority of the identifiable assemblage in AC 1 and include a mixture of glass bottle fragments, ceramic dishware, animal bones, metal cans, and bottle caps. The bulk of the bottle assemblage is composed of amber- and clear-colored glass shards from beverage and food containers; aqua-, green-, amethyst-, milk-, and cobalt-colored bottle fragments are also present but found in lesser quantities. Ceramic artifacts are fairly common in AC 1 with plain, white dishware the most prevalent recorded type. Four sherds of a higher-quality delftware were also identified in Locus C in the central portion of the concentration. A number of cow bone remains were recorded within AC 1; all of these bones were highly weathered, with a few specimens displaying evidence of butchering marks. Finally, a handful of sanitary and hole-in-top metal cans, as well as metal bottle caps, were also noted scattered throughout the concentration.

FIGURE REMOVED FOR CONFIDENTIALITY

TABLE 5.3.2.5-1
ESTIMATES OF ARTIFACTS BY TYPE AT KD SITE 1

Artifact Concentration		AC 1									AC 2			AC 3						
Locus		**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**A**	**B**	**C**	**A**	**B**	**C**	**AC 4**	**AC 5**	**AC 6**	**Total**
Vessel glass	Green	2	1		5	10		5		5	10				5		5	2	5	**55**
	Clear	3	30	25	15	10	20	10		5	100	2	30				15	5	5	**275**
	Amber			30	30		75	50	5	30	50	1	15		30		15	40	50	**421**
	Aqua			15	15	10	20	10	5	15	10			20	40		3	100	75	**338**
	Amethyst			5	1	5	5		5	5				15	10		50	20		**121**
	Milk	2	2	1	1	2													5	**13**
	Cobalt						1			1	5									**7**
	Yellow												3							**3**
Ceramic	Plain white dishware				30	20	50	5	1	10	15		10	25	1			30	20	**217**
	Delftware			4															2	**6**
	Slipped terracotta									1									21	**22**
	Fiestaware										17								10	**27**
Animal bone			20	10	8		24						5	6		10	10			**93**
Structural and industrial artifacts	Brick	15		10		10	20	3	1			16	22					1		**98**
	Corrugated metal			1																**1**
	Marble trim		1			1														**2**
	Concrete								2											**2**
	Metal nail			1		1	1										2	1		**6**
	Metal bolt			1					1											**2**
	Metal wire						1													**1**
	Metal pipe							1											1	**2**
	Metal cable							3												**3**
	Metal strip					1			3									2		**6**
	Ceramic insulator						3													**3**
	Ceramic lightbulb base			1		1							1						1	**4**
	Carbon battery rods	2	7	5			5	13		1			1							**34**
	Rubber-lined fabric	3																		**3**
	Milled wood																		2	**2**
Metal containers	Metal can						1	10			9		5	10	5					**40**
	Rectangular container					2					2									**4**
	Bucket				1				1		2									**4**
	Bottle cap				5															**5**
	Metal drum																1			**1**
Miscellaneous artifacts	Clothing rivet			4																**4**
	Glass spectacles			1																**1**
	Rubber shoe sole										3									**3**
	Metal fragments		1,000	800	1,000	200	2,000	1,000	400	200	80	30	300	200	50	6	20	100	100	**7,486**
	Charcoal piece							1												**1**
Total		**27**	**1,061**	**914**	**1,111**	**273**	**2,226**	**1,111**	**424**	**273**	**303**	**49**	**392**	**276**	**141**	**16**	**121**	**301**	**297**	**9,316**

A diverse assemblage of structural- and industrial-related artifacts was also recorded within AC 1. Over half of these artifacts consist of brick fragments, several of which had the brand name "Cowen" impressed onto their faces (Image 5.3.2.5-2, *Portion of Brick Identified in Artifact Concentration 1 at KD Site 1*). Archival data indicates that these bricks were manufactured in northern England by Joseph Cowen and Company between 1823 and 1904.[221] Large quantities of firebrick were imported into California from Europe as shipping ballast during the latter part of the 19th and early 20th centuries.[222]

Image 5.3.2.5-2. Portion of Brick Identified in Artifact Concentration 1 at KD Site 1

This type of firebrick (also called refractory, or kiln bricks) was made of higher-density clay that could be pressed to remove air and water, thereby enabling the brick to withstand high temperatures. Evidence of vitrification and blackening on some of the bricks in AC 1 suggests these artifacts were exposed to high temperatures during their use life. A cursory examination of the remnants of furnaces or ovens at the nearby Inyo Development Company facility indicates that a similar type of brick was used in the construction of these features, suggesting these remains originated from the soda ash plant.

Other possible structural- or industrial-related artifacts identified in AC 1 include corrugated metal sheets, pieces of marble trim, hardened concrete concentrations, metal nails and bolts, metal wire and cable, metal pipe fittings, metal strips, a ceramic insulator, ceramic lightbulb bases, carbon battery rods, several fragments of a rubber-lined fabric, and a large piece of burned wood.

Some of the most interesting finds in AC 1 are personal items, most of which were found in Locus C. These include a broken pair of eyeglasses and four metal clothing buttons (Image 5.3.2.5-3, *Broken Eyeglasses from Locus C, AC 1 at KD Site 1*). No information could be found on the manufacturer of the eyeglasses or the date of their production. The buttons appear to derive from overalls or work clothing and are embossed with the logo of their respective companies of manufacture (B & L Crown Brand buttons [$n = 2$], the Levi Strauss Company [$n = 1$], and the Eloesser-Heynemann Company [$n = 1$]).

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[221] Gurcke, Karl. 1987. *Bricks and Brickmaking*, pp. 71. University of Idaho Press, Boise.

[222] Perry, Frank. 2008. Bricks Tell of 16,000-mile Voyage. *Lime Kiln Chronicles*. University of California, Santa Cruz.

Image 5.3.2.5-3. Broken Eyeglasses from Locus C, AC 1 at KD Site 1

A total of 21 artifacts with temporally diagnostic maker's marks were recorded in AC 1 at KD Site 1. A summary of each artifact and its date of production are provided in the DPR form for KD Site 1 in Appendix C. An examination of the distribution of date ranges associated with these artifacts indicates that trash may have been deposited in the area of AC 1 as early as the late 1800s, with most of the dates clustering around the early decades of the 20th century. Some evidence was also found to suggest trash deposition continued in the area at late as the 1960s. These data suggest long-term use of KD Site 1 as a dumping locale for both household and industrial refuse.

Artifact Concentration 2 (AC 2). This historic period artifact concentration measures 90 feet by 60 feet and consists of three loci (A, B, and C), each of which represents multiple episodes of trash deposition. The feature is located along the northern extent of the site immediately north of the abandoned dirt road (Figure 5.3.2.5-1). A total of 744 artifacts comprise AC 2, the bulk of which are unidentified metal fragments ($n = 410$) (Table 5.3.2.5-1). Culinary-related artifacts are the most abundant identified remains and include 226 fragments of clear-, amber-, green-, aqua-, and yellowish-colored bottle glass. A variety of white ceramic dishware and Fiestaware (turquoise-, green-, and yellow-slipped) are also present in AC 2. Finally, sanitary and hole-in-top metal can fragments and animal bones are represented within the trash scatter.

Found in substantially smaller quantities, structural- and industrial-related artifacts in AC 2 include brick fragments, along with single occurrences of a carbon battery rod and ceramic light bulb base (Table 5.3.2.5-1). While the presence of a "Cowen" stamp on one of the bricks indicates that the remains may have been deposited in this area as early as the late 1800s, most of the temporally diagnostic artifacts identified in AC 2 indicate a later date of deposition (see DPR form for KD Site 1 in Appendix C). Specifically, the dated materials from this concentration suggest the most intensive use of the area as a trash dump between the 1930s and 1960s.

Artifact Concentration 3 (AC 3). This artifact concentration measures 125 feet by 150 feet and is located in the eastern portion of KD Site 1 (Figure 5.3.2.5-1). Consisting of three loci (A, B, and C), AC 3 contains a total of 433 artifacts (Table 5.3.2.5-1). Unidentified metal fragments comprise the largest proportion of the assemblage with 59 percent of recorded remains ($n = 256$). Unlike AC 1 and AC 2, AC 3 is almost exclusively composed of culinary-related remains that include: 120 fragments of aqua-, amber-, amethyst- and green-colored bottle glass, 26 pieces of plain ceramic dishware, 26 pieces of weathered animal bone, and 25 metal food can fragments.

Although no maker's marks were identified on artifacts in AC 3, temporal information collected during site recordation indicate a relatively early date of use of this area for trash deposition. One piece of clear bottle glass was found in Locus B that was embossed with the wording "Dr. Kilmer's Swamp Root Kidney, Liver, & Bladder Remedy." Archival research indicates that this bottle was manufactured by Dr. Kilmer & Company, Binghampton, New York, sometime between 1895 and 1906.[223] An early-20th-century use date is also suggested by the relatively large number of solarized glass fragments recorded in the artifact concentration.[224]

Artifact Concentration 4 (AC 4). This small artifact concentration measures 45 feet by 20 feet and is located just north of the abandoned road and east of the Carson & Colorado Railroad (Figure 5.3.2.5-1). A total of 121 artifacts were recorded in the concentration (Table 5.3.2.5-1), most of which were amethyst-, clear-, amber-, green-, and aqua-colored container glass ($n = 88$). Other artifacts reported in the scatter include unidentified metal fragments, animal bone, two metal nails, and a large metal drum. The presence of solarized glass fragments in AC 4 indicates that the trash was deposited in this area prior to World War I.[225]

Artifact Concentration 5 (AC 5). This artifact concentration measures 30 feet by 20 feet and is located in the southern portion of the site to the west of the Carson & Colorado Railroad (Figure 5.3.2.5-1). Bottle glass fragments comprise the bulk of the identified remains ($n = 167$) and include aqua-, amber-, amethyst, clear- and green-colored containers (Table 5.3.2.5-1). A relatively large quantity of plain, white dishware was also identified in AC 5 ($n = 30$). Smaller quantities of structural- or industrial-related items were recorded in the concentration and include two metal strips, a brick fragment, and a metal nail. Maker's marks on two glass bottle bases suggest the concentration likely represents trash deposited in the early 20th century (Appendix C).

Artifact Concentration 6 (AC 6). This artifact concentration measures 60 feet by 45 feet and is located south of the abandoned road and north of AC 5 (Figure 5.3.2.5-1). Culinary-related debris comprises the bulk of the remains in the concentration and includes 140 glass bottle fragments (aqua-, amber-, green-, clear-, and milk-), a variety of ceramic dishware (plain white, Delftware, Fiestaware, and slipped terra cotta ware). Industrial- or structural-related artifacts consist of a section of metal pipe, a ceramic lightbulb base, and two fragments of milled wood (Table 5.3.2.5-1). Temporally diagnostic artifacts indicate that these remains may have been deposited in the area during the 1930s or possibly later.

Road Alignment. A 550-foot-long section of an abandoned dirt road was located in the western and central portions of KD Site 1 (Figure 5.3.2.5-1). The feature runs in the southwest-to-northeast direction and consists of a linearly deflated area that averages 25 feet in width (Image 5.3.2.5-4, *Abandoned Road at KD Site 1 with Artifact Concentration 4 in the Background*). While an exact date of construction is not known, examination of historic maps of the area indicates that the road

[223] Smith, Ruthann. 2006. "What's in your Closet?" In *Idaho Archaeological Society 21*(1).

[224] Lockart, Bill. 2006. "The Color Purple: Dating Solarized Amethyst Container Glass." *Historical Archaeology* 40(2):45-56.

[225] Lockart, Bill. 2006. "The Color Purple: Dating Solarized Amethyst Container Glass." *Historical Archaeology* 40(2):45-56.

was likely built sometime between 1941 and 1951 (Image 5.3.2.5-5, *Historic 1951 USGS 15-Minute Topographic Map of Keeler, California, Showing Road Segment at KD Site 1*).[226,227] No artifacts appear to be directly associated with the road alignment. However, the proximity of the feature to AC 1 and AC 2, which both contain trash that post-dates the road construction, suggests that local populations may have accessed the area via the roadway to dispose of household refuse.

IMAGE REMOVED FOR CONFIDENTIALITY

Image 5.3.2.5-4. Abandoned Road at KD Site 1 with Artifact Concentration 4 in the Background

[226] Automobile Club of Southern California. 1941. *US395 US6 Map Section from Automobile Club of Southern California Mojave & Colorado Deserts*. Available at http://www.historicalroadmaps.com/CaliforniaPage/DeathValleyPage/image2.html

[227] United States Department of the Interior Geological Survey. 1951. *15-Minute Topographic Map of Keeler, CA*. Denver, CO.

IMAGE REMOVED FOR CONFIDENTIALITY

Image 5.3.2.5-5. Historic 1951 USGS 15-Minute Topographic Map of Keeler, California, Showing Road Segment at KD Site 1

Finally, evidence of prehistoric use at KD Site 1 can be seen in the two possible cairn features that were identified in the southwestern portion of the site (Figure 5.3.2.5-1). Located just south of Artifact Concentration 6, the possible cairns consist of small clusters of rock, each of which contained at least one piece of ground stone (Image 5.3.2.5-6, *Photograph of Cairn 2 at KD Site 1*). Although no other artifacts were associated with these features, a basalt core (Core 2) was found in close proximity (see Figure5.3.2.5-1). A yellow cryptocrystalline silicate (jasper) core was also identified in the eastern portion of the site (Core 1). The location of this artifact in a deflated area downslope from CA-INY-6502 suggests that the artifact may have been washed into the area during a recent rainstorm.

Image 5.3.2.5-6. Photograph of Cairn 2 at KD Site 1

A high degree of similarity can be seen in the composition of the six historic artifact concentrations at KD Site 1. All of these assemblages are dominated by culinary artifacts with structural- and industrial-related items comprising relatively small proportions of the total artifact counts. The abundance of household refuse indicates that the area containing KD Site 1 may have been regularly used for the disposal of domestic trash. The lack of evidence of residential structures in the immediate vicinity, as well as proximity of the area to historic roads, indicates that these remains were the product of secondary dumping, in which accumulated trash from residential loci were transported to another location for deposition. The large quantity of artifacts found at the site suggests that the accumulated refuse was the result of multiple dumping episodes that took place over a relatively long period of time.

Given the volume and diversity of artifacts at KD Site 1, analysis of the historic remains may be used to address a wide variety of research issues including socioeconomic status, ethnicity, health/hygiene practices, dietary habits, technology, trash disposal methods, and demography. Based on the potential of the historic component of KD Site 1 to contribute important information about early-20th-century life in the Owens Valley, this cultural resource is recommended eligible for inclusion on the NRHP under Criterion D.

In evaluating a property's eligibility under Criterion D, the physical characteristics and features of a site must retain enough integrity to convey its significance. Historical archaeological sites related to waste disposal contain some unique aspects of integrity.[228] Because by definition the waste has been removed from its initial point of use and may be mixed with other deposits, the importance of the contextual relationship among and between items is vastly diminished. Therefore, the association of the deposit with the source of the trash is very important. In the case of KD Site 1,

[228] Sullivan, Michael, and Carol Giffith. 2005.*Down in the Dumps, Context Statement and Guidance on Historical-Period Waste Management and Refuse Deposits*, pg. 27. Contributions from the SHPO Advisory Committee on Historic Archaeology, State Historic Preservation Office, Phoenix.

the presence of firebricks and other industrial artifacts suggest that the refuse may be associated with the nearby Inyo Development Company facility, situated less than 0.2 mile away on the historic lakeshore. However, a number of temporally diagnostic artifacts were identified at the site which postdate 1920, when operations at the soda ash plant were discontinued.[229] These data indicate that a more likely source of the historic trash at KD Site 1 was the community of Keeler, located approximately 1 mile to the southeast. Archaeological research on historic dump sites in Arizona indicates that communal open dumps of this type are usually located between 1 and 3 miles from the community generating the materials.[230]

The prehistoric component of KD Site 1 is also recommended eligible for the NRHP under Criterion D. These remains have the potential to provide important information about prehistoric land use practices of the Owens Lake shoreline. Examination of the cairn features indicate they are characterized by a high level of integrity with no evidence of disturbance in the immediate area.

KD Site 2. This site consists of a section of the Old State Highway that runs from a point south of Keeler to a point north of Swansea along the northwestern edge of Owens Lake (Figure B-4). Although most of the alignment is located outside of the proposed project / proposed action area, a short section of the road traverses the southwestern portion of the APE. The historic road segment is aligned in the southwest-to-northwest direction and measures appropriately 5.0 miles in length with an average width of 18 feet. An exact date of the construction of the road could not be ascertained. However, a historic map of the area dating to 1913 depicts a road running along this portion of the lakeshore between Lone Pine and Keeler just south of the Carson & Colorado Railroad line (Image 5.3.2.5-7, *1913 USGS Topographic Map of Keeler Area Showing Alignment of KD Site 2*).[231]

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[229] University of Nevada, Reno. n.d. *A Guide to the Records of the Inyo Development Company*. Collection No. NC73. Special Collections Section, University of Nevada, Reno. Available at: http://www.library.unr.edu/specoll/mss/NC73.html

[230] Sullivan, Michael, and Carol Giffith. 2005.*Down in the Dumps, Context Statement and Guidance on Historical-Period Waste Management and Refuse Deposits*, pg. 15. Contributions from the SHPO Advisory Committee on Historic Archaeology, State Historic Preservation Office, Phoenix.

[231] U.S. Geological Survey. 1913 (reprinted 1921) 1:250,000 Series Ballarat, California, Topographic Quadrangle.

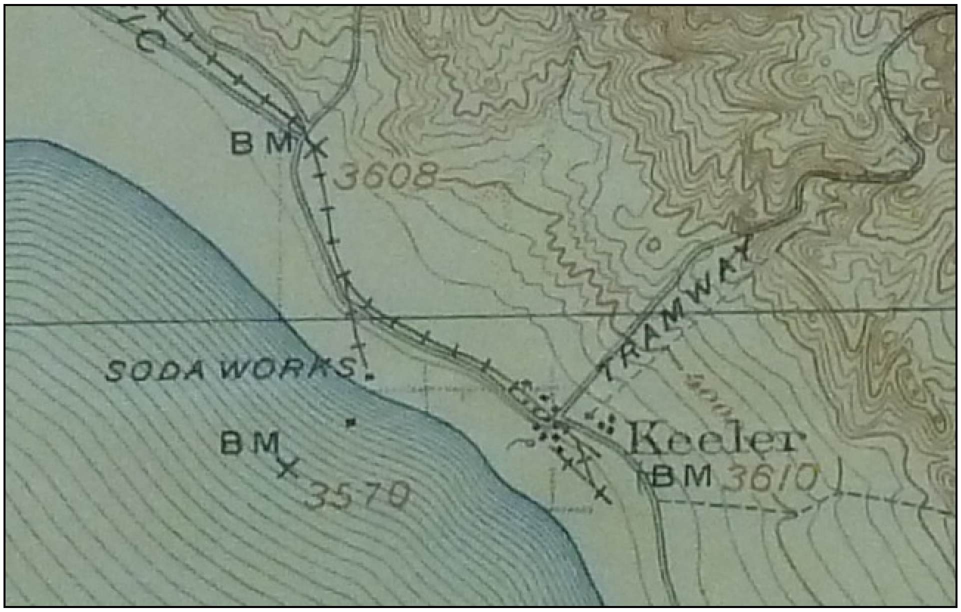

Image 5.3.2.5-7. 1913 USGS Topographic Map of Keeler Area Showing Alignment of KD Site 2

Archival information indicates that the Lone Pine to Keeler road was added to the State Highway System in 1933 as part of Legislature Route Number (LRN) 127, which connected U.S. Route 99 at Tipton to U.S. Route 66 at Baker.[232] LRN 127 was later divided into three separate state routes, with the portion of the road between Lone Pine and Keeler renumbered State Route 136. The portion of the roadway between Swansea and Keeler was realigned in the early 1950s due to blowing sands from Owens Lake and moved further eastward to its current location along the base of the Inyo Mountains.[233] While the road is no longer part of the highway system, it is still regularly used to access Keeler Dunes and the adjacent lakebed.

In this area, natural and cultural processes have resulted in the destruction or alteration of much of the original roadbed of the Old State Highway. Within the proposed project / proposed action area, the site is largely covered by active sand dunes and is no longer visible on the ground surface (Image 5.3.2.5-8, *View of KD Site 2 in the Proposed Project / Proposed Action Area, Looking Southeast*). Further to the north, portions of the road have also been severely damaged by recent alluvial activity resulting in the deposition of silt over the roadbed. Finally, as illustrated in Figure B-4, a 0.5-mile-long section of the original road north of the proposed project / proposed action area has been destroyed by the implementation of dust mitigation measures along the historic shoreline.

[232] Caltrans 2009. *State Route 136 Transportation Concept Report*. Caltrans District 9 Office of System Planning, Bishop California.

[233] Hancock, Paul. 18 November 2004. "Keeler Right of Way, History and Chronology." Independence, CA: County of Inyo Department of Public Works.

IMAGE REMOVED FOR CONFIDENTIALITY

Image 5.3.2.5-8. View of KD Site 2 in the Proposed Project / Proposed Action Area, Looking Southeast

The Old State Highway was once a significant transportation corridor within the Owens Valley. As such, it may be eligible for inclusion on the NRHP under Criterion A, for its association with important events and trends that have contributed to the broad patterns of our history. As discussed above, however, the road suffers a severe lack of integrity due to erosional processes and realignment of portions of the roadway. Due to the loss of integrity of KD Site 2, the portion of this cultural resource within the proposed project / proposed action property is recommended ineligible for listing on the NRHP or CRHR.

P-14-7851/CA-INY-6513H. The update to this historic archaeological Department of Parks and Recreations (DPR) site form consists of a previously unrecorded segment of the Carson & Colorado Railroad located in the southwestern portion of the proposed project / proposed action area and APE (Figure B-4). A 706-foot-long segment of the railroad berm was initially recorded in 2005 in the area southeast of Swansea.[234] The site was described as consisting of narrow gauge railroad berm which measured 12 to 18 inches above the surrounding ground surface; associated artifacts included railroad spikes, steel tie plates, and fragments of wooden ties.[235]

As previously mentioned, the Carson & Colorado narrow gauge railway runs from Mound House, Nevada to Keeler. The route crossed the Nevada-California border near Montgomery Pass before heading south near Benton to follow the Owens River and run along the eastern edge of Owens Lake to Keeler. Construction of the northern portion of the 293-mile-long stretch of narrow gauge rail line began in 1880 and with the completion of the railway at Keeler in 1883. While the Carson & Colorado line was primarily built to transport of ore from the mines along east side of Owens Lake, the rail hauled other cargo, including timber and fuel. Agriculture also made up a notable

[234] Burton, Jeffery F. 2005. *Cultural Resources Inventory of a Proposed Temporary Road at Swansea, Inyo County, California*. Manuscript on file, Barnard Construction, Inc., Bozeman, Montana.

[235] California Department of Parks and Recreation. 2005. Update to Primary Record for CA-INY-6513H. Site form on file at the Eastern Information Center, University of California, Riverside, CA.

portion of the railroad's freight, with Owens Valley farmers producing and shipping hay, vegetables, and meat to mining communities in southern Nevada.[236]

Although the Carson & Colorado Railroad was originally intended to continue onto Mojave, this latter section of the railway was never built. The Carson & Colorado Railroad Company controlled the line until its sale to the Southern Pacific Railroad in 1900. The railroad saw regular use until 1920s, when the construction of the Los Angeles Aqueduct and diversion of water from Owens Lake took a significant toll on agricultural production in the area and salt mining on Owens Lake. Use of the rail line steadily decreased in the following decades until the line was abandoned and the rails were pulled in 1960.[237]

Three segments of the Carson & Colorado Railroad were recorded in the proposed project / proposed action area and APE (Figure B-4). The linear segments run in a roughly northwest-to-southeast direction and total 669 feet in length. While the railroad line was, in the past, a continuous alignment, the surrounding dunes have now covered portions of the alignment and buried segments under several feet of sand.

The northern two sections of the railroad line, which measure 397 feet and 60 feet in length, respectively, exhibit a raised rail bed covered with gravel and small cobbles (Image 5.3.2.5-9, *Northern Portion of CA-INY-6513H in the Proposed Project / Proposed Action Area, Looking Northwest*). The berm in these areas measures approximately 14 feet in width with a height ranging from 1 and 2 feet above the surrounding ground surface. The southernmost segment of CA-INY-6513H is 212-feet-long and differs markedly from the other portions of the rail line; this segment is characterized by a linearly deflated area that is largely devoid of any remnants of the railroad bed (Image 5.3.2.5-10, *Southern Extent of CA-INY-6513H in the Proposed Project / Proposed Action Area, Looking Northwest*). Artifacts found along this segment of the railroad alignment, as well as the two northern sections, include rusted railroad spikes, metal ties, and fragments of wooden rail ties.

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[236] California Department of Parks and Recreation. 2006. Update to Primary Record for CA-INY-6513H. Site form on file at the Eastern Information Center, University of California, Riverside, CA.

[237] Turner, George. 1965. *Narrow Gauge Nostalgia*. J-H Publications, Harbor City, CA.

IMAGE REMOVED FOR CONFIDENTIALITY

Image 5.3.2.5-9. Northern Portion of CA-INY-6513H in the Proposed Project / Proposed Action Area, Looking Northwest

IMAGE REMOVED FOR CONFIDENTIALITY

Image 5.3.2.5-10. Southern Extent of CA-INY-6513H in the Proposed Project / Proposed Action Area, Looking Northwest

A previous evaluation of CA-INY-6513H was conducted in 2006 by JRP Historical Consulting.[238] At that time, it was concluded that the site did not meet the criteria for listing either on the NRHP or the CRHR. In addition, they noted that the abandonment and salvage of the rail lines, along with the effects of weather and dune formation, have resulted in a severe loss of integrity to the cultural resource. Because the only remaining signs of the site were scattered spikes, tie plates, and related minor debitage, researchers argued that "the passer-by would not readily note it as a railroad."[239] As such, JRP Historical Consulting determined that the lack of integrity associated with the cultural resource also excludes it from inclusion on the NRHP or CRHR.

The three segments of CA-INY-6513H that were recorded by Sapphos Environmental, Inc. within the proposed project / proposed action area exhibit a similar level of integrity as the previously documented sections of the railroad alignment. Given this, the portion of the site located within the proposed project / proposed action area is recommended not eligible for listing on the NHRP or CRHR.

Isolates. Seventeen archaeological isolates were identified during surveys conducted in conjunction with Mr. Greg Haverstock. Sixteen of the isolates date to the historic period and are located within Staging Area 3 or the 100 foot buffer. A prehistoric isolate was recorded by Mr. Haverstock within a temporary irrigation line leading to Staging Area 2. None of the isolates are recommended eligible to the NRHP or CRHR. Table 5.3.2.5-2, *BLM Recorded Archaeological isolates within the APE* provides a summary of the isolates and eligibility status.

[238] California Department of Parks and Recreation. 2006. Update to Primary Record for CA-INY-6513H. Site form on file at the Eastern Information Center, University of California, Riverside, CA.

[239] California Department of Parks and Recreation. 2006. Update to Primary Record for CA-INY-6513H. Site form on file at the Eastern Information Center, University of California, Riverside, CA.

TABLE 5.3.2.5-2
BLM RECORDED ARCHAEOLOGICAL ISOLATES WITHIN THE APE

Resource ID	Period	Description	Eligibility Recommendations
BLM ISO-1	Historic	Brown colored, thick walled, mold blown bottle	Recommended Not Eligible
BLM ISO-2	Historic	2 fragments of broken ceramic electrical insulator	Recommended Not Eligible
BLM ISO-3	Historic	Metal fragments, log bolt, large bolt	Recommended Not Eligible
BLM ISO-4	Historic	Sheet metal	Recommended Not Eligible
BLM ISO- 5	Historic	Steel pipe, 6 fragments,	Recommended Not Eligible
BLM ISO-6	Historic	2 fragments of broken ceramic electrical insulator	Recommended Not Eligible
BLM ISO-7	Historic	Steel sheet with bolt holes and opening, riveted	Recommended Not Eligible
BLM ISO- 8	Historic	Steel wire, 2 gauges, fragments, 9 segments	Recommended Not Eligible
BLM ISO-9	Historic	Ceramic electrical insulator fragments	Recommended Not Eligible
BLM ISO-10	Historic	Telephone pole cross member with insulated post	Recommended Not Eligible
BLM ISO-11	Historic	Karo syrup bottle fragment, clear glass (1968-present)	Recommended Not Eligible
BLM ISO-12	Historic	Gallon and 1/2 gallon wine jugs clear glass	Recommended Not Eligible
BLM ISO-13	Historic	Solarized brown Clorox bottle neck and rim (1958-present), and glass ketchup bottle, octagonal with solarized clear glass	Recommended Not Eligible
BLM ISO-14	Historic	Brown Duraglas been bottle(1947)	Recommended Not Eligible
BLM ISO-15	Historic	Brown Duraglas been bottle(1941)	Recommended Not Eligible
BLM ISO-16	Historic	Wire sand fence (8 strands)	Recommended Not Eligible
BLM ISO-17	Prehistoric	Elongated rock cairn	Recommended Not Eligible

Summary of Class III Survey Results

Three additional areas containing cultural resources were identified during the limited Class III survey of three of the four proposed staging area and access route locations. A very sparse scatter (approximately 1 artifact per 900 square meters) of obsidian debitage was identified on the alluvium sediment surrounding Staging Area 1. A second obsidian scatter of lower density was identified on the aeolian deposits near the planned access route leading to Staging Area 2. A few isolated bone fragments were observed along the southeastern portion of the northwest-southeast access route within 20 meters of the CA-INY-6502 site boundary. These artifacts were not formally recorded in the field – their extremely low density precluded them from being recorded as a site, and suggests that they are associated with the known archaeological sites in the vicinity.

Alternative staging area and access route locations were surveyed in order to find areas completely free of surface cultural resources (Figure 4.3.2-1). An alternative northwest-southeast access route segment was found that would avoid the bone fragments observed near CA-INY-6502 by at least 100 feet. An alternative location and alternative access route were surveyed for Staging Area 2 that avoided all identified cultural resources by at least 100 feet, and an alternative location and alternative access route were found for Staging Area 1 that would disturb a minimal amount of identified cultural resources.

5.3.2.6 Native American Sacred Sites and Human Remains in the Cultural Resources Study Area

A Native American sacred site is defined by the NAHC as an area that has been, and often continues to be, of religious significance to Native American peoples, such as an area where religious ceremonies are practiced or an area that is central to their origins as a people.[240] Results of a record search of the Sacred Lands File for the proposed project / proposed action site by the NAHC failed to indicate the presence of any sacred sites in the cultural resources study area (see Appendix A).[241] However, the NAHC did indicate that the Keeler Dunes area is known as a culturally sensitive area and recommended that additional coordination be undertaken with local Native American groups and individuals on the matter. As a result of this recommendation, Sapphos Environmental, Inc. sent letters to 10 Native American contacts classified by the NAHC as potential sources of information related to cultural resources in the vicinity of the proposed project / proposed action area. This outreach resulted in responses from two tribal representatives:

Matthew Nelson, a Tribal Historic Preservation Officer and NAGPRA Coordinator of the Bishop Paiute Tribe, did not identify any specific sacred sites in the cultural resources study area but noted that:

> [I]t is known among cultural staff, elders and traditionalists that the Keeler Dunes and foothills of the Inyo Mountains east of Owens Lake contain heavy densities of cultural resources and extremely culturally sensitive areas.[242]

Kathy Fabunan, a tribal administer for the Lone Pine Paiute-Shoshone Tribe, indicated that she could not give out information about sensitive sites around the Keeler Dunes area. She stated she would forward a request for information to the Cultural Committee:

> The Tribe's policy is that all information of that nature must come from the Chairman so as to assure that the information is has the OK of the membership.[243]

As of this writing, Sapphos Environmental, Inc. has received no response from the Cultural Committee of the Lone Pine Paiute-Shoshone Tribe.

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[240] Native American Heritage Commission. Accessed 21 July 2006. "Understanding Cultural Resources." Available at: www.nahc.ca.gov/understandingcr.html

[241] Singleton, Dave, Native American Heritage Commission, Sacramento, CA. 31 August 2011. Letter response to Clarus Backes, Sapphos Environmental, Inc., Pasadena, CA.

[242] Nelson, Matthew, Tribal Historic Preservation Officer and NAGPRA Coordinator, Bishop Paiute Tribe, Bishop, CA. 8 December 2011. Email response to Clarus Backes, Sapphos Environmental, Inc., Pasadena, CA

[243] Kathy Fabunan, Tribal Administer, Lone Pine Paiute-Shoshone Reservation, Lone Pine, CA. 3 October 2011. Email response to Clarus Backes, Sapphos Environmental, Inc., Pasadena, CA

Consultation efforts undertaken by BLM indicate that the archaeological remains associated with CA-INY-6502 are culturally and religiously significant to Native American groups living in the Owens Valley.[244] As previously stated, the archaeological evidence suggests that this area within the Keeler Dunes was used prehistorically as a burial site. Ethnographic information collected during the Phase II investigations at the sites also indicate that a Shoshone massacre may have taken place at this locale during the Indian Wars.[245] Mr. Melvin Checo, a Koso Shoshone elder, reported that the cairns that comprise CA-INY-6502 represent burials of Native Americans that were killed by the U.S. Calvary at Keeler Dunes in the 1860s.[246] Specifically, Mr. Checo stated that the people that were killed were buried individually where they died with all their belongings.

Each cairn represents the place:

> where they were gunned down at and whoever survived go on putting rocks in and bury em see.[247]

Taken together, the archaeological and ethnographic data indicate that CA-INY-6502 is a Native American sacred site that is part of a larger mortuary complex containing multiple prehistoric and possibly historic period burial features.

5.3.3 Application of the Criteria of Adverse Effect

In accordance with Section 106 of the NHRP, the Criteria of Adverse Effect was applied to the historic properties in the APE of the proposed project / proposed action (as defined in Section 2.0, *Project Description*). This section describes the results of this assessment, details the effects of the undertaking on significant cultural resources, and explains why the undertaking was found to have no adverse effects on historic properties.

5.3.3.1 Definition of Criteria of Adverse Effect

Adverse effects were evaluated with regard to the Criteria of Adverse Effect, formulated by the Advisory Council on Historic Preservation. According to these criteria,

> An *Adverse Effect* is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that

[244] Halford, F. Kirk and Kim Carpenter. 2005. *Results of Limited Phase II Testing at the Keeler Dunes Sites, Owens Valley, California*, pp. 20. Cultural Resource Project: CA-170-03-11. Report prepared by Far Western Anthropological Research Group, Inc., Davis, CA.

[245] Halford, F. Kirk and Kim Carpenter. 2005. *Results of Limited Phase II Testing at the Keeler Dunes Sites, Owens Valley, California*, pp. 20. Cultural Resource Project: CA-170-03-11. Report prepared by Far Western Anthropological Research Group, Inc., Davis, CA.

[246] Halford, F. Kirk and Kim Carpenter. 2005. *Results of Limited Phase II Testing at the Keeler Dunes Sites, Owens Valley, California*, pp. 20. Cultural Resource Project: CA-170-03-11. Report prepared by Far Western Anthropological Research Group, Inc., Davis, CA.

[247] Halford, F. Kirk and Kim Carpenter. 2005. *Results of Limited Phase II Testing at the Keeler Dunes Sites, Owens Valley, California*, pp. 20. Cultural Resource Project: CA-170-03-11. Report prepared by Far Western Anthropological Research Group, Inc., Davis, CA.

may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, by farther removed in distance or be cumulative. (36 CFR Part 800.5 [a] [1])

Examples of Adverse Effects on historic properties under 36 CFR 800.5 (a) (2) include, but are not limited to,

(i) Physical destruction of or damage to all or part of the property;
(ii) Alteration of a property that is not consistent with the Secretary of Interior's Standards for treatment of historic properties (36 CFR 68) and applicable guidelines;
(iii) Removal of the property from its historic location;
(iv) Change of the character of the property's use or of physical features within the property's setting that contribute to its historical significance;
(v) Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting;
(vi) Neglect of a property resulting in its deterioration or destruction; and
(vii) Transfer, lease, or sale of the property.

5.3.3.2 Historic Properties in the APE

To evaluate the adverse effects of the proposed project / proposed action on cultural resources in the Keeler Dunes area, the APE was mapped in relation to known archaeological sites within the cultural resources study area (Figure B-5, *Locations of Archaeological Sites and Historic Buildings and Structures in Relation to APE* and Figure B-6, *Detailed Map of Archaeological Sites in APE* [Appendix B]). As previously discussed, the APE includes all of the elements and areas of planned ground disturbance, along with a 100-foot buffer. As shown on Figure B-5, portions of four archaeological sites are found within the APE: CA-INY-6502, KD Site 1, KD Site 2, and BLM-Site 1. Although the latter two cultural resources are ineligible for inclusion on the NRHP, both CA-INY-6502 and KD Site 1 were determined to be historic properties. As such, an assessment of the adverse effect of the proposed undertaking on these significant cultural resources is necessary.

5.3.3.3 Avoidance Measures

As shown in Figure B-6, the portions of CA-INY-6502 and KD Site 1 located within the APE primarily fall within the area designated for 85 percent dust control efficiency. The main DCM in these areas will be the planting of native vegetation and the placement of straw bales that will act as temporary wind breaks within active dune areas. These materials will be transported to the area using all-terrain vehicles (ATV) along a temporary access route that will be run along the northern edge of CA-INY-6502 (see Figure B-6). No vehicular traffic shall occur within the site boundaries. The vegetation and straw bales will be hand carried along designated foot paths to their respective planting areas. The planting of vegetation will involve the hand excavation of small holes (less than one-foot in depth) for the placement of individual seedlings. The seedlings will be clustered in groups of three and will be spaced approximately 2 to 4 meters from one another. Individual straw bales will be positioned on the windward side of the seedlings to provide protection to the small plants; these straw bales will be left *in situ* to decompose.

The 85 percent dust control efficiency that would be implemented during the proposed action allows some flexibility in the locations of the plant and straw bale clusters. As such, areas within CA-INY-6502 and KD Site1 that contain culturally sensitive deposits can be avoided under the proposed undertaking. These areas tend to be located in deflated areas between the active dunes where cultural remains have been exposed by moving sands. To ensure that no cultural deposits within CA-INY-6502 and KD Site 1 are adversely affected by the transport and placement of the vegetation and straw bales, a qualified archaeologist will undertake an intensive surface survey of the portions of CA-INY-6502 and KD Site 1 falling within the APE prior to the initiation of construction activities. This work will involve the identification and recording of identified artifacts and features using handheld global positioning system (GPS) units. A spatial analysis in GIS will then be undertaken to determine the specific placement of vegetation, straw bales, and foot paths within the site boundary of CA-INY-6502 and KD Site 1 in order to avoid impacts to significant cultural deposits. The District shall submit a final proposed construction scenario to the BLM for approval prior to the initiation of ground disturbing activities that depicts the location of these elements and their relation to surface artifacts and features.

Given the cultural sensitivity of the Keeler Dunes area, it is recommended that the BLM archaeologist coordinate a preconstruction briefing to provide information to workers regarding the procedures and regulatory requirements for the protection of significant archaeological resources. Construction personnel should be instructed on procedures to be followed in the event that cultural resources are encountered during construction. The District should also retain a qualified archaeologist and Native American monitor to be present during all ground-disturbing activities undertaken in, or within 100 feet of, the CA-INY-6502 and KD Site 1 site boundaries. If previously undocumented cultural remains are encountered during project / proposed action implementation, operations should be immediately stopped in the area, and the BLM Bishop Field Office manager and archaeologist should be notified immediately. Once the find was assessed and evaluated, modification to the proposed project / proposed action would be made as need to avoid impacts of these archaeological discoveries prior to the resumption of work.

5.3.3.4 Assessment of Adverse Effects on Historic Properties in the APE

The proposed project / proposed action will not alter or damage any portion of CA-INY-6502 and KD Site 1 that qualifies the cultural resources for inclusion on the NRHP under Criterion D, their ability to yield information important to the study of prehistory or history. Minor ground disturbance resulting from the planting of seedlings, placement of straw bales, and inadvertent foot traffic, is expected to occur within the site boundaries of CA-INY-6502 and KD Site 1. However, the proposed project / proposed action has been designed to limit these disturbances to those areas of the sites that lack significant cultural deposits. Because the data potential of these historic properties will not be impacted by the undertaking, the proposed project / proposed action would not constitute an adverse effect under Adverse Effect Criterion 2(i).

The planting of native vegetation and placement of straw bales does not have the potential to change physical features within the properties' setting or introduce visual elements that are out of character with CA-INY-6502 and KD Site 1 (Adverse Effect Criteria 2[iv] and 2[v], respectively). As discussed above and in Section 2.0, *Project Description*, a variety of native plant species will be established in the APE in a manner that mimics indigenous vegetation in the Keeler Dunes area. Because these newly established biotic communities will be similar to the vegetation in the surrounding environs, the physical and visual changes that will result from this DCM can be considered compatible with the current setting and feeling of the historic properties. The placement of straw bales within the boundaries of CA-INY-6502 and KD Site 1 has the potential to visually alter or change the properties' setting; however, due to the temporary nature of the straw bales, this DCM does not represent an adverse effect to the historic properties. This undertaking will not physically or visually alter or damage the portions of CA-INY-6502 and KD Site 1 in the

APE in such a manner that would diminish the integrity of their location, design, setting, materials, workmanship, feeling, and association.

Other examples in the assessment of adverse effect do not apply to the proposed project. Specifically, the undertaking will not alter a property that is not consistent with the Secretary of Interior's Standards for treatment of historic properties (36 CFR 68) and applicable guidelines (Adverse Effect Criteria 2[ii]). Furthermore, the proposed project / proposed action will not remove any property from its historic location (Adverse Effect Criteria 2[iii]); neglect a property resulting in its deterioration or destruction (Adverse Effect Criteria 2[vi]); or transfer, lease, or sale a property (Adverse Effect Criteria 2[vii]).

5.4 SUMMARY OF FINDINGS

The results of the paleontological field survey, Class I and Class III inventories, and site recordation efforts presented in this Cultural Resources Technical Report demonstrate that the proposed undertaking will not adversely affect significant paleontological or cultural resources within the APE. As such, a finding of no adverse effect is appropriate for the undertaking.

SECTION 6.0 REFERENCES

Automobile Club of Southern California. 1941. *US395 US6 Map Section from Automobile Club of Southern California Mojave & Colorado Deserts*. Available at http://www.historicalroadmaps.com/CaliforniaPage/DeathValleyPage/image2.html

Backes, Clarus, Sapphos Environmental, Inc., Pasadena CA. 24 August 2011. Letter to Larry Myers, Native American Heritage Commission, Sacramento, CA.

Bacon, S., and N. Lancaster. 2012. *Geomorphic Map of Keeler Dunes Area*. Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA. Prepared by: Division of Earth and Ecosystem Sciences, Desert Research Institute, Reno, NV.

Bacon, S.N., R.M. Burke, S.K. Pezzopane, and A.S. Jayko. 2005. "Last Glacial Maximum and Holocene Lake Levels of Owens Lake, Eastern California, USA." *Quaternary Science Reviews*, 1–19.

Basgall, M.E. 1989. "Obsidian Acquisition and Use in Prehistoric Central-Eastern California: A Preliminary Assessment." In *Current Directions in California Obsidian Studies*, ed. R.E. Hughes. Contributions of the University of California Archaeological Research Facility, 48. Berkeley, CA: University of California Archaeological Research Facility.

Basgall, M.E. 2000. "The Structure of Archaeological Landscapes in the North-Central Mojave Desert." In *Archaeological Passages: A Volume in Honor of Claude Nelson Warren*, ed. J.S. Schneider, R.M. Yohe II, and J.K. Gardner. Hemet, CA: Western Center for Archaeology and Paleontology, Publications in Archaeology.

Basgall, M.E., and K.R. McGuire. 1988. *The Archaeology of CA-INY-30: Prehistoric Culture Change in the Southern Owens Valley, California*. Prepared by: Far Western Anthropological Research Group, Inc., Davis, CA. Prepared for: California Department of Transportation, Bishop, CA.

Basgall, M.E., and M.C. Hall. 1994. "Perspectives on the Early Holocene Archaeological Record of the Mojave Desert." In *Kelso Conference Papers 1987–1992, A Collection of Papers and Abstracts from the First Five Kelso Conferences on the Prehistory of the Mojave Desert*, ed. G. Dicken Everson and Joan S. Schneider. Occasional Papers in Anthropology 4. Bakersfield, CA: California State University, Bakersfield, Museum of Anthropology.

Benson, L., M. Kashgarian, R. Rye, S. Lund, F. Paillet, and J. Smoot. 2002. "Holocene Multidecadal and Multicentennial Droughts Affecting Northern California and Nevada." *Quaternary Science Review*, *21*: 659–682.

Bettinger, R.L. 1975. "The Surface Archaeology of Owens Valley, Eastern California: Prehistoric Man-Land Relationships in the Great Basin." PhD dissertation, University of California, Riverside, Department of Anthropology.

Bettinger, R.L. 1977. "Aboriginal Human Ecology in Owens Valley, Eastern California: Prehistoric Change in the Great Basin." *American Antiquity*, *43*: 3–17.

Bettinger, R.L. 1982. "Aboriginal Exchange and Territoriality in Owens Valley, California." In *Context for Prehistoric Exchange*, ed. J.E. Ericson and T.K. Earle. New York, NY: Academic Press.

Bettinger, R.L. 1982. "Aboriginal Sociopolitical Organization in the in Owens Valley: Beyond the Family Band." In *The Development of Political Organization in Native North America*, ed. E. Tooker and M.H. Fried. Washington, DC: American Ethnological Society.

Bettinger, R.L. 1982. "Archaeology East of the Range of Light: Aboriginal Human Ecology of the Inyo-Mono Region, California." *Monographs in California and Great Basin Anthropology*, *1*. Davis, CA.

Bettinger, R.L., and M.A. Baumhoff. 1982. "Numic Spread: Great Basin Cultures in Competition." *American Antiquity*, *47*: 485–503.

Bettinger, R.L., and R.E. Taylor. 1974. "Suggested Revisions in Archaeological Sequences of the Great Basin in Interior Southern California." *Nevada Archaeological Research Paper*, *5*: 1–26.

Bradey, W. 1938. *Thirty-fourth Annual Report of the State Mineralogist*. Volume XXXIV. Sacramento, CA: California State Mining Bureau.

Bureau of Land Management. 11 March 2005. *Land Use Planning Handbook BLM Handbook H-1601-1*. Available at: http://www.blm.gov/nhp/200/wo210/landuse_hb.pdf

Bureau of Land Management. 2008–2009. *Guidelines for Determining Paleontological Significance*. Available at: http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/im_attachments/2008.Par.69083.File.dat/IM2008-009_att1.pdf.

Bureau of Land Management. 25 October 1988. *National Environmental Policy Act BLM Handbook H-1790-1*. Available at: http://www.blm.gov/nhp/efoia/wo/handbook/h1790-1.pdf

Bureau of Land Management. 3 December 2004. *Manual Series 8100*. Available at: www.blm.gov

Burton, Jeffery F. 2005. *Cultural Resources Inventory of a Proposed Temporary Road at Swansea, Inyo County, California*. Manuscript on file, Barnard Construction, Inc., Bozeman, MT.

Calef, W. 1951. "The Salines of Southeastern California." *Economic Geography*, *27*(1): 43–64.

California Department of Parks and Recreation. 2005. "Update to Primary Record for CA-INY-6513H." Site form on file at the Eastern Information Center, University of California, Riverside, CA.

California Department of Parks and Recreation. 2006. "Update to Primary Record for CA-INY-6513H." Site form on file at the Eastern Information Center, University of California, Riverside, CA.

California Department of Parks and Recreation. 2007. "Primary Record for CA-KER-7219H." Site form on file at the Southern San Joaquin Valley Information Center, California State University, Bakersfield, CA.

California Department of Transportation (Caltrans). 2009. *State Route 136 Transportation Concept Report*. Bishop, CA: Caltrans District 9 Office of System Planning.

California Public Resources Code, Division 13, Sections 21083.2, 21084.1; Section 5024.1.

Campbell, E.W.C. 1949. "Two Ancient Archaeological Sites in the Great Basin." *Science*, *109*(2831): 340.

Campbell, E.W.C., and W.H. Campbell. 1935. "The Pinto Basin Site." In *Southwest Museum Paper*, 9. Los Angeles, CA: Southwest Museum.

Campbell, E.W.C., W.H. Campbell, E. Antevs, C.E. Amsden, J.A. Barbieri, and F.D. Bode. 1937. "The Archaeology of Pleistocene Lake Mojave." In *Southwest Museum Paper*, 9. Los Angeles, CA: Southwest Museum.

Chalfant, W.A. 1933. *The Story of Inyo*. Bishop, CA: Chalfant.

Clark, Tiffany, Sapphos Environmental, Inc., Pasadena, CA. 16 March 2011. Contact Report to Greg Haverstock, BLM Bishop Field Office, Bishop, CA.

Code of Federal Regulations, 36 CFR 60.2, 60.4.

DeDecker, M. 1966. *Mines of Eastern Sierra*. Glendale, CA: La Siesta.

Dillon, B.D. 2002. "California Palaeoindians: Lack of Evidence, or Evidence of a Lack?" In *Essays in California Archaeology: A Memorial to Franklin Fenenga*, ed. W.J. Wallace and F.A. Riddell. Contributions of the University of California Archaeological Research Facility, 60 Berkeley, CA: University of California Archaeological Research Facility.

Driver, H.E. 1937. "Cultural Element Distributions, VI: Southern Sierra Nevada." *University of California Anthropological Records*, *1*(2): 53–154.

Dub, G.D. 1947. "Owens Lake, California-Source of Sodium Minerals." In *American Institute of Mining and Metallurgical Engineers*. Industrial Mineral Division (Non Metallics), 173. New York, NY: Institute at the Office of the Secretary.

Due, J. 1951. "The Carson and Colorado Railroad." *Economic Geography*, *27*(3): 251–267.

Fabunan, Kathy, Tribal Administer, Lone Pine Paiute-Shoshone Reservation, Lone Pine, CA. 3 October 2011. Email response to Clarus Backes, Sapphos Environmental, Inc., Pasadena, CA.

Fabunan, Kathy, Tribal Administer, Lone Pine Paiute-Shoshone Reservation, Lone Pine, CA. 3 October 2011. Email response to Clarus Backes, Sapphos Environmental, Inc., Pasadena, CA.

Fiero, B. 1986. *Geology of the Great Basin*. Reno, NV: University of Nevada Press.

Garcia and Associates. 2011. *Cultural Resources Survey Report for the Owens Lake Dust Control Program, Phase 7a Project, Owens Lake, California*. Prepared for: MWH and Los Angeles Department of Water and Power, Los Angeles, CA.

Gilreath, A.J., and K.L. Holanda. 2000. *By the Lake by the Mountains: Archaeological Investigations at CA-INY-4554 and INY-1428*. Prepared by: Far Western Anthropological Research Group, Inc., Davis, CA. Prepared for: California Department of Transportation, District 9, Bishop, CA.

Great Basin Unified Air Pollution Control District. 2003. *2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Environmental Impact Report*. Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA. Prepared by: Sapphos Environmental, Inc., Pasadena, CA.

Great Basin Unified Air Pollution Control District. February 2004. *2003 Owens Valley PM10 Planning Area Demonstration of Attainment State Implementation Plan Integrated Environmental Impact Report*. State Clearinghouse House Number 2002111020. Prepared by: Sapphos Environmental, Inc., Pasadena, CA. Bishop, CA.

Great Basin Unified Air Pollution Control District. 2008. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Environmental Impact Report*. Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA. Prepared by: Sapphos Environmental, Inc., Pasadena, CA.

Great Basin Unified Air Pollution Control District. January 2008. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan—Final Subsequent Environmental Report*. Prepared by: Sapphos Environmental, Inc., Pasadena, CA. Bishop, CA.

Great Basin Unified Air Pollution Control District. 2012. "Origin and Development of the Keeler Dunes." Available at http://gbuapcd.org/keelerdunes/originanddevelopment/.

Gurcke, Karl. 1987. *Bricks and Brickmaking*. Boise: University of Idaho Press.

Gust, S. May 2003. *Paleontological Assessment Report and Mitigation Plan for the Owens Valley Project, Inyo County, California*. Prepared for: Sapphos Environmental, Inc., Pasadena, CA. Prepared by: Cogstone Resource Management, Inc., Santa Ana, CA.

Gust, S., and K. Scott. Revised July 2007. *Paleontological Evaluation of 2008 Supplemental Control Requirements for the Owens Valley PM10 Planning Area Demonstration of Attainment State Implementation Plan, Inyo County, California*. Submitted to: Sapphos Environmental, Inc., Pasadena, CA. Prepared by: Cogstone Research Management, Santa Ana, CA.

Gust, Sherri. 2003. *Paleontological Assessment Report and Mitigation Plan for the Owens Valley Project, Inyo County, California*. Prepared for: Sapphos Environmental, Inc., Pasadena, CA. Prepared by: Cogstone Resource Management Inc., Santa Ana, CA.

Gust, Sherri, and Kim Scott. 2008. *Paleontological Evaluation of 2008 Supplemental Control Requirements for the Owens Valley PM10 Planning Area Demonstration of Attainment State Implementation Plan, Inyo County, California*. Prepared for: Sapphos Environmental, Inc., Pasadena, CA. Prepared by: Cogstone Resource Management Inc., Santa Ana, CA.

Halford, F. Kirk, and Kim Carpenter. 2005. *Results of Limited Phase II Testing at the Keeler Dunes Sites, Owens Valley, California*. Cultural Resource Project: CA-170-03-11. Prepared by: Far Western Anthropological Research Group, Inc., Davis, CA.

Hamilton, F. 1920. *Seventeenth Annual Report of the State Mineralogist*. Volume XVII. Sacramento, CA: California State Mining Bureau.

Hancock, Paul. 18 November 2004. *Keeler Right of Way, History and Chronology*. Independence, CA: Inyo County Department of Public Works.

Harrington, M.R. 1957. *A Pinto Site at Little Lake, California*. Southwest Museum Papers, 17. Los Angeles, CA: Southwest Museum.

Haverstock, Greg. 17–20 March 2010. "Stones and Bones: The Southern Owens Valley Mortuary Complex." Paper presented at the Society for California Archaeology, 2010 Annual Meeting, Riverside, CA.

Hayes, O.P. 1927. "The Pleistocene of the Western Region of North American and Its Vertebrate Animals." *Carnegie Institute of Washington Publication*, *322*(B): 1–346.

Hundley, N. 2001. *The Great Thirst: Californians and Water: A History*. Los Angeles, CA: University of California Press.

Hunt, C.B. 1967. *Physiography of the United States*. San Francisco, CA: W.H. Freeman.

Inyo County Planning Department. December 2001. *Inyo County General Plan*. Independence, CA.

Irwin, C.N. 1980. *The Shoshone Indians of Inyo County, California. The Kerr Manuscript*. Independence, CA: Ballena.

Jefferson, G.T. 1989. "Late Pleistocene and Earliest Holocene Fossil Localities and Vertebrate Taxa from the Western Mojave Desert." In *The West-Central Mojave Desert: Quaternary Studies between Kramer and Afton Canyon*, ed. G.T. Jefferson. Redlands, CA: SBCM Association Special Publication.

Jefferson, G.T. 1991. *A Catalogue of late Quaternary Vertebrates from California: Part Two, Mammals*. Technical Reports No. 7. Los Angeles, CA: Natural History Museum of Los Angeles County.

Jones and Stokes. 1997. *Cultural Resources Inventory and Evaluation of Historic Resources on the Eastern Side of Owens Lake for the Great Basin Unified Air Pollution Control District*. Prepared by: Jones and Stokes, Sacramento, CA. Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA.

Jones and Stokes. 2002. *Archaeological Investigations at CA-INY-30, 200, 2001* (J&S 01-006). Prepared by: Jones and Stokes, Sacramento, CA. Prepared for: Los Angeles Department of Water and Power, Los Angeles, CA.

Jones and Stokes. 2002. *California Register of Historical Resources Evaluation of a Historic Pipeline at Cartago, California*. Prepared by: Jones and Stokes, Sacramento, CA. Prepared for: Los Angeles Department of Water and Power, Los Angeles, CA.

Jones and Stokes. 2005. *Final Archaeological Testing and Evaluation of 25 Sites on the Owens Lake Playa, Inyo County, California*. Volumes I and II. Prepared by: Jones and Stokes, Sacramento, CA. Prepared for: CH2MHILL, Santa Ana, CA.

Jones and Stokes. 2007. *Cultural Resources Inventory of Two Parcels in the Moat and Row Testing Area, Owens Lake Dust Mitigation Program, Inyo County, California*. Prepared by: Jones and Stokes, Sacramento, CA: Prepared for: Los Angeles Department of Water and Power, Los Angeles, CA.

Jones and Stokes. 2008. *Archaeological Testing and Evaluation of Sites in Phase 7 of the Owens Lake Dust Mitigation Program, Inyo County, California* (EIC Report No. IN-00857). Prepared by: Jones and Stokes, Sacramento, CA. Prepared for: Los Angeles Department of Water and Power, Los Angeles, California.

Kahrl, W. 1982. *Water and Power*. Berkeley, CA: University of California Press.

Krautter, F. 1959. *The Story of Keeler*. Independence, CA: Owens Inyo Company.

Kroeber, A.L. 1925. *Handbook of the Indians of California*. New York, NY: Dover.

Lamb, S.M. 1958. *Northfork Mono Grammar*. Unpublished PhD dissertation in Linguistics, University of California, Berkeley.

Lancaster, N. March 2012. *Development of the Keeler Dunefield, Inyo County, California, Part 1 – Analysis of Aerial Photographs and Satellite Imagery*. Prepared by: DRI. Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA.

Lanning, E.P. 1963. "The Archeology of Rose Spring Site Iny-372." *University of California Publications in American Archaeology and Ethnology*, *49*(3): 237–336.

Lawton, H.W., P.J. Wilke, M. DeDecker, and W.M. Mason. 1976. "Agriculture among the Paiute of Owens Valley." *Journal of California Anthropology*, *3*: 13–50.

Li, H.-C., J.L. Bischoff, T.L. Ku, S.P. Lund, and L.D. Stott. 2000. "Climate Variability in East Central California during the Past 1000 Years Reflected by High Resolution Geochemical and Isotopic Records from Owens Lake Sediments." *Quaternary Research*, *54*: 189–197.

Ligenenfelter, R. 1962. "The Desert Steamers." *Journal of the West*, *1*(2).

Liljeblad, S., and C.S. Fowler. 1986. "Owens Valley Paiute." In *Handbook of North American Indians*, Volume 11, *Great Basin*. Washington, DC: Smithsonian Institution.

Lockart, Bill. 2006. "The Color Purple: Dating Solarized Amethyst Container Glass." *Historical Archaeology 40* (2): 45–56.

Los Angeles Times. 17 June 1928. "Owens Valley Farming Grows."

Madsen, D.B., and D. Rhode. 1994. *Across the West: Human Population Movement and the Expansion of the Numa*. Salt Lake City, UT: University of Utah Press.

Mallery, G. 1886. "Pictographs of the North American Indians: A Preliminary Paper." In *Fourth Annual Report of the Bureau of Ethnology to the Secretary of the Smithsonian Institution: 1882–1883*, Director J. W. Powell. Washington, DC: Government Printing Office.

Mallery, G. 1972. *Picture-Writing of the American Indians*, Volume 1. New York, NY: Dover.

McLeod, Samuel, Natural History Museum of Los Angeles County, Los Angeles, CA. 11 October 2011. Letter response to Clarus Backes, Sapphos Environmental, Inc., Pasadena, CA.

Mehringer, P.J., Jr., and J.C. Sheppard. 1978. *Holocene History of Little Lake, Mojave Desert, California*. Los Angeles, CA: Natural History Museum of Los Angeles County.

Miller, W.R. 1986. "Numic Languages." In *Handbook of North American Indians*, Volume 11, *Great Basin*. Washington, DC: Smithsonian Institution.

Mineral Information Services. 1959. "Soda Ash Industry of Owens Lake (1887-1959)." *State of California Division of Mines*, *12*(10).

Nadeau, R. 1958. *Ghost Towns and Mining Camps of California*. Los Angeles, CA: Ward Ritchie.

Native American Heritage Commission. Accessed 21 July 2006. "Understanding Cultural Resources." Available at: www.nahc.ca.gov/understandingcr.html

Natural Soda Products Company. 10 February 1953. *Certificate of Dissolution of Natural Soda Products Company*. Certificate filed in the Office of the Secretary of State of the State of California.

Nelson, Clemens A., Clarence A. Hall Jr., and W.G. Ernst. 1991. "Geologic History of the White-Inyo Range." In *Natural History of the White Inyo-Range Eastern California*, ed. Clarence A. Hall Jr. Berkeley, CA: University of California Press.

Nelson, Matthew, Tribal Historic Preservation Officer and NAGPRA Coordinator, Bishop Paiute Tribe, Bishop, CA. 8 December 2011. Email response to Clarus Backes, Sapphos Environmental, Inc., Pasadena, CA.

O'Connell Family. 1995. *Desert Days: Living in the California Desert, 1914–1929*. North Hills, CA: Rock Ink.

Office of Historic Preservation. 4 September 2002. "Technical Assistance Series #3, California Register of Historical Resources: Questions and Answers." Available at: http://www.ohp.parks.ca.gov

Office of Historic Preservation. 14 March 2006. "Technical Assistance Bulletin 6: California Register and National Register, A Comparison (for Purposes of Determining Eligibility for the California Register)." Available at: http://www.ohp.parks.ca.gov

Office of Historic Preservation. n.d. "California Historical Landmarks Registration Programs." Available at: http://www.ohp.parks.ca.gov

Office of Historic Preservation. n.d. "California Points of Historical Interest Registration Programs." Available at: http://www.ohp.parks.ca.gov

Orme, A.R, and A.J. Orme. 1993. "Late Pleistocene Oscillations of Lake Owens, Eastern California." *Geological Society of America Abstracts with Programs*, *25*: 129–130.

Owens Valley Herald Newspaper. 25 December 1908. "New Soda Company Will Begin Manufacture of Many Products."

Perry, Frank. 2008. "Bricks Tell of 16,000-Mile Voyage." In *Lime Kiln Chronicles*. Santa Cruz: University of California, Santa Cruz.

Pipkin, G. 1974. *Cartago, My Cartago*. Unpublished manuscript on file at the Eastern California Museum, Independence, CA.

Primary Site Record for CA-INY-6502 and CA-INY-6503 (Update). Record on file at the Bureau of Land Management, Bishop Field Office, Bishop, CA.

Riddell, F.A. 1958. "The Eastern California Border: Cultural and Temporal Affinities." *Reports of the University of California Archaeological Survey*, *42*: 41–48.

Riddell, H.S., Jr. 1951. "The Archaeology of a Paiute Village Site in Owens Valley." *Reports of the University of California Archaeological Survey*, *12*(15): 14–28.

Riddell, H.S., Jr., and F.A. Riddell. 1956. "The Current Status of Archaeological Investigations in Owens Valley, California." *Reports of the University of California Archaeological Survey*, *33*(38): 28–33.

Roberts, G., and J. Roberts. 2004. *Discover Historic California*. Baldwin Park, CA: Gem Guides Book Company.

Saint-Amand, P., C. Gaines, and D. Saint-Amand. 1987. "Owens Valley, an Ionic Soap Opera Staged on a Natric Playa." In *Geology of the Owens Valley and Inyo Mountains Region, California*. Annual Field Trip Guide Book, No. 20-2001. Santa Ana, CA: South Coast Geological Society.

Sapphos Environmental, Inc. 2008. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Final Subsequent Environmental Impact Report, Cultural Resources Technical Report*. Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA. Pasadena, CA.

Sapphos Environmental, Inc., 2008. 2008 *Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan, Final Cultural Resources Technical Report*. Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA. Prepared by: Sapphos Environmental, Inc., Pasadena, CA.

Scott, Eric, San Bernardino County Museum, Redlands, CA. 28 February 2012. Letter response to Tiffany Clark, Sapphos Environmental, Inc., Pasadena, CA.

Sharp, R.P., and A.F. Glazner. 1997. "A Story of Desiccation; Once-Blue Owens Lake." In *Geology Underfoot in Death Valley and Owens Valley*. Missoula, MT: Mountain Press.

Singleton, Dave, Native American Heritage Commission, Sacramento, CA. 31 August 2011. Letter response to Clarus Backes, Sapphos Environmental, Inc., Pasadena, CA

Smith, D. 1 December 1974. "70-Year Water Dispute: Fact, Fable Hard to Separate." *Los Angeles Times*.

Smith, G.I., and J.L. Bischoff, eds. 1993. "Core O.L. 92 from Owens Lake, Southeast California." U.S. Geological Survey, Open File Report 93-683. Menlo Park, CA: U.S. Department of the Interior.

Smith, Ruthann. 2006. "What's in Your Closet?" *Idaho Archaeological Society 21*(1).

Soil and Water West, Inc. 25 September 2001. *Owens Lakebed Survey (Revised)*. Prepared by: Soil and Water West, Inc., Rio Rancho, NM. Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA.

Steward, J.H. 1933. "Ethnography of the Owens Valley Paiute." *University of California Publications in American Archaeology and Ethnology*, *33*(3): 233–350.

Steward, J.H. 1934. "Two Paiute Ethnographies." *University of California Publications in American Archaeology and Ethnology*, *33*(5): 423–438.

Steward, J.H. 1937. "Linguistic Distributions and Political Groups of the Great Basin Shoshoneans." *American Anthropologist*, *39*(4): 625–634.

Steward, J.H. 1938. "Basin Plateau Aboriginal Sociopolitical Groups." *Bureau of American Ethnology Bulletin*, *120*. Washington, DC.

Steward, J.H. 1972. *Theory of Culture Change, the Methodology of Multilinear Evolution*. Chicago, IL: University of Illinois Press.

Stine, S. 1994. *Late Holocene Fluctuations of Owens Lake, Inyo County, California*. Prepared for: Far Western Anthropological Research Group, Inc., Davis, CA.

Streitz, R., and M.C. Stinson. 1974. "Geologic Map of California: Death Valley Sheet." Los Angeles, CA.

Sullivan, Michael, and Carol Giffith. 2005. *Down in the Dumps, Context Statement and Guidance on Historical-Period Waste Management and Refuse Deposits*. Contributions from the SHPO Advisory Committee on Historic Archaeology, State Historic Preservation Office, Phoenix, AZ.

Sutton, M.Q. 1996. "The Current Status of Archaeological Research in the Mojave Desert." *Journal of California and Great Basin Anthropology*, *18*(2): 221–257.

Thomas, D.H. 1981. "How to Classify the Projectile Points from Monitor Valley, Nevada." *Journal of California and Great Basin Anthropology*, *3*(1): 7–43.

Thomas, D.H. 1983. "The Archaeology of Monitor Valley I: Epistemology." *Anthropological Papers of the American Museum of Natural History*, *59*(1).

Thomas, D.H., L. Pendleton, and S. Cappannari. 1986. "Western Shoshone." In *Handbook of North American Indians*, Volume 11, *Great Basin*. Washington, DC: Smithsonian Institution.

Turner, George. 1965. *Narrow Gauge Nostalgia*. Harbor City, CA: J-H Publications.

U.S. Department of the Interior Geological Survey. 1951. *15-Minute Topographic Map of Keeler, CA*. Denver, CO.

U.S. Department of the Interior, National Park Service. 2000. *National Register Bulletin: Guidelines for Evaluating and Registering Archeological Properties*. Available at: http://www.cr.nps.gov/nr/publications/bulletins/arch/

U.S. Department of the Interior, National Park Service. 2002. *How to Apply the National Register Criteria for Evaluation*. National Register Bulletin 15. Washington, DC.

U.S. Geological Survey. [1913] Reprinted 1921. *1:250,000 Series Ballarat, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1987. *7.5-Minute Series, Dolomite, California, Topographic Quadrangle*. Denver, CO.

U.S. Geological Survey. 1987. *7.5-Minute Series, Owens Lake, California, Topographic Quadrangle*. Denver, CO

United States Code, 16 USC 470.

University of Nevada, Reno. n.d. *A Guide to the Records of the Inyo Development Company*. Collection No. NC73. Special Collections Section, University of Nevada, Reno. Available at: http://www.library.unr.edu/specoll/mss/NC73.html

Warren, C.N. 2002. "Time, Form, and Variability: Lake Mojave and Pinto Periods in Mojave Desert Prehistory." In *Essays in California Archaeology: A Memorial to Franklin Fenenga*, ed. W.J. Wallace and F.A. Riddell. Contributions of the University of California Archaeological Research Facility, 60. Berkeley, CA: University of California Archaeological Research Facility.

Wehrey, J. 2006. *Voices from This Brown Land*. New York, NY: Palgrave Macmillan.

Wells, H. 2003. *Cultural Resources Survey for 2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan, Final Report*. Prepared by: Ancient Enterprises, Inc., Santa Monica, CA. Prepared for: Sapphos Environmental, Inc., Pasadena, CA.

Wilke, P.J., and H.W. Lawton, eds. 1976. *The Expedition of Capt. J. W. Davidson from Fort Tejon to the Owens Valley in 1859*. Socorro, NM: Ballena.

Wright, D. 2005. "California Ghost Towns." Available at: http://www.ghosttowns.com/states/ca/olancha.html

Yohe, R.M. 2000. "'Rosegate' Revisited: Rose Spring Point Temporal Range in the Southwestern Great Basin." In *Archaeological Passages: A Volume in Honor of Claude Nelson Warren*, ed. J.S. Schneider, R.M. Yohe II, and J.K. Fardnet. Publications in Archaeology No. 1. Hemet, CA: Western Center for California Archaeology and Paleontology.

Yohe, R.M., II. 1992. *A Reevaluation of Western Great Basin Cultural Chronology and Evidence for the Timing and Introduction of the Bow and Arrow to Eastern California Based on New Excavations at the Rose Spring Site (CA-INY-372)*. PhD dissertation, University of California, Riverside.

Yohe, R.M., II. 1998. "The Introduction of the Bow and Arrow and Lithic Resource Use at Rose Spring (CA-INY-372)." *Journal of California and Great Basin Anthropology*, *20*(1).

APPENDIX F
PALEONTOLOGICAL SURVEY REPORT

SWCA®
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Paleontological Survey Report for the Keeler Dunes Project, Owens Lake, Inyo County, California

Prepared for

Sapphos Environmental Inc.

Prepared by

SWCA Environmental Consultants

October 2013
CA Report # CA13-26471-001

Paleontological Survey Report for the Keeler Dunes Project, Owens Lake, Inyo County, California

Prepared for

Sapphos Environmental Inc.

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CA Report # CA13-26471-001

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1.0 INTRODUCTION

This report presents the results of the paleontological field survey completed for the Keeler Dunes Non-attainment Area access roads and staging areas (Project).This project has been contracted to Sapphos Environmental Inc. (Sapphos) by the Great Basin Unified Air Pollution Control District. The project is located on federal land (Bureau of Land Management [BLM]) as well as land held by Los Angeles Department of Water and Power (LADWP) and the Southern Pacific Railroad (SPRR) in Sections 25 and 36, Township (T) 16 South (S), Range (R) 37 East and Section 31, T 16 S, R 38 E in Inyo County, California (Figure 1). The area surveyed includes the access roads, three staging areas and a 100-foot buffer (APE) (Figure 1). These portions of the greater project area were selected for pedestrian survey because they have the greatest potential to be impacted during the implementation of the proposed project. The survey was conducted by SWCA Environmental Consultants (SWCA) at the request of Sapphos to provide paleontological surface clearance through a pedestrian examination of the APE.

2.0 DEFINITION AND SIGNIFICANCE OF PALEONTOLOGICAL RESOURCES

Paleontology is a multidisciplinary science that combines elements of geology, biology, chemistry, and physics in an effort to understand the history of life on earth. Paleontological resources, or fossils, are the remains, imprints, or traces of once-living organisms preserved in rocks and sediments. These include mineralized, partially mineralized, or un-mineralized bones and teeth, soft tissues, shells, wood, leaf impressions, footprints, burrows, and microscopic remains. Paleontological resources include not only fossils themselves, but also the associated rocks or organic matter and the physical characteristics of the fossils' associated sedimentary matrix.

The fossil record is the only evidence that life on earth has existed for more than 3.6 billion years. Fossils are considered non-renewable resources because the organisms they represent no longer exist. Thus, once destroyed, a fossil can never be replaced (Murphey and Daitch 2007). Fossils are important scientific and educational resources and can be used to:

- study the phylogenetic relationships amongst extinct organisms, as well as their relationships to modern groups;
- elucidate the taphonomic, behavioral, temporal, and diagenetic pathways responsible for fossil preservation, including the biases inherent in the fossil record;
- reconstruct ancient environments, climate change, and paleoecological relationships;
- provide a measure of relative geologic dating which forms the basis for biochronology and biostratigraphy, and which is an independent and corroborating line of evidence for isotopic dating;
- study the geographic distribution of organisms and tectonic movements of land masses and ocean basins through time;
- study patterns and processes of evolution, extinction, and speciation; and

- identify past and potential future human-caused effects to global environments and climates (Murphey and Daitch 2007).

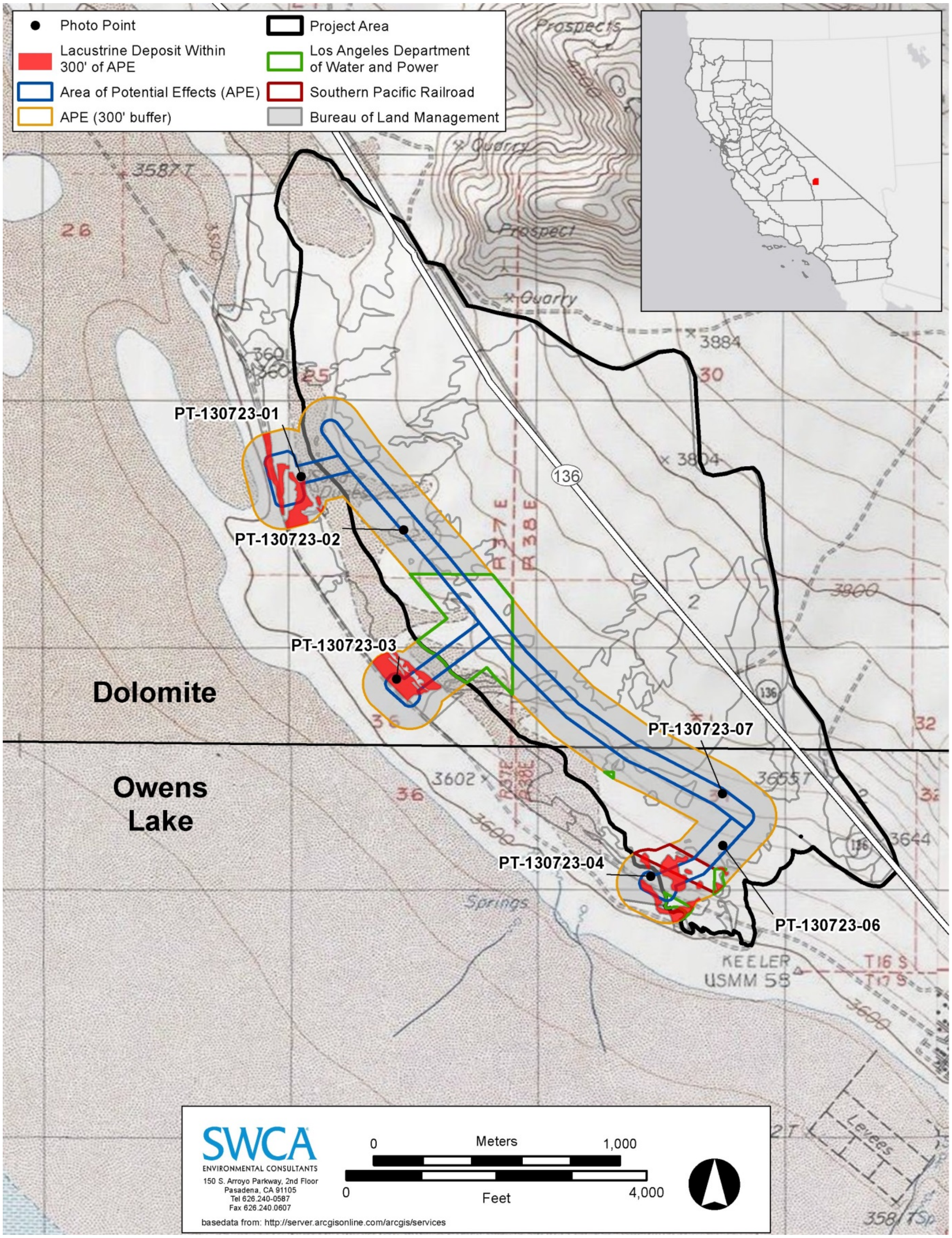

Figure 1. Paleontological survey map for the Keeler Dunes Project showing exposed lacustrine deposits within the APE.

3.0 METHODS

3.1 STATE OF CALIFORNIA AUTHORITIES

Guidelines for the Implementation of CEQA, as amended March 29, 1999 (Title 14, Chapter 3, California Code of Regulations: 15000 *et seq*.) define procedures, types of activities, persons, and public agencies required to comply with CEQA, and include as one of the questions to be answered in the Environmental Checklist (Section 15023, Appendix G, Section XIV, Part a) the following: "*Will the proposed project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?*"

Other state requirements for paleontological resource management are included in the Public Resources Code (Chapter 1.7), Section 5097.5 and 30244. These statutes prohibit the removal of any paleontological site or feature on public lands without permission of the jurisdictional agency, defines the removal of paleontological sites or features as a misdemeanor, and requires reasonable mitigation of adverse impacts to paleontological resources from developments on public (state) lands.

3.2 BUREAU OF LAND MANAGEMENT AUTHORITIES AND STANDARDS

This paleontological analysis was conducted at the request of the BLM in accordance with their policies. The BLM currently uses the Federal Land Management and Policy Act of 1976 as the legislative authority for its paleontological resource policies. Additionally, the BLM's Instructional Memorandum (IM) 2008-009 (2007), Manual H-8720-1 (BLM 1998), and IM 2009-011 (BLM 2008) provide general procedural guidelines for the management of paleontological resources. Management objectives include locating, evaluating, managing, and protecting paleontological resources, as well as ensuring that proposed land-use projects do not inadvertently damage or destroy important paleontological resources.

Implementing regulations for the Paleontological Resources Preservation Subtitle of the Omnibus Public Lands Act of 2009 (PRPA), Title VI, Subtitle D, are currently being developed. Under the PRPA, the Secretaries (Interior and Agriculture) shall manage and protect paleontological resources on federal land using scientific principles and expertise. The PRPA is modeled after the Archaeological Resources Protection Act and incorporates the recommendations of the May 2000 report of the Secretary of the Interior, Assessment of Fossil Management on Federal and Indian Lands, regarding future actions to formulate a consistent paleontological resources management framework. With the passage of the PRPA, congress officially recognized the importance of paleontological resources on federal lands by declaring that fossils from federal lands are federal property. The PRPA essentially codifies existing policies of the BLM, National Park Service, U.S. Forest Service, Bureau of Reclamation, and U.S. Fish and Wildlife Service. The PRPA provides the following.

- Uniform definitions for paleontological resources and casual collecting.
- Uniform, minimum requirements for paleontological resource-use permit issuance (terms, conditions, and qualifications of applicants).

- Uniform criminal and civil penalties for illegal sale and transport, and theft and vandalism of fossils from federal lands.
- Uniform requirements for curation of federal fossils in approved repositories.

According to BLM's IM 2009-011 (BLM 2008:1-18 to 1-19) a Significant Paleontological Resource is defined as:

> Any paleontological resource that is considered to be of scientific interest, including most vertebrate fossil remains and traces, and certain rare or unusual invertebrate and plant fossils. A significant paleontological resource is considered to be scientifically important because it is a rare or previously unknown species, it is of high quality and well-preserved, it preserves a previously unknown anatomical or other characteristic, provides new information about the history of life on earth, or has identified educational or recreational value. Paleontological resources that may be considered to not have paleontological significance include those that lack provenience or context, lack physical integrity because of decay or natural erosion, or that are overly redundant or are otherwise not useful for research. Vertebrate fossil remains and traces include bone, scales, scutes, skin impressions, burrows, tracks, tail drag marks, vertebrate coprolites (feces), gastroliths (stomach stones), or other physical evidence of past vertebrate life or activities.

3.3 ANALYSIS OF EXISTING DATA METHODS

Geologic units (bedrock formations and surficial sedimentary deposits) have been assigned a Potential Fossil Yield Classification System (PFYC) ranking by the authors of this report based on the results of prior and present paleontological work. These assignments were based on the taxonomic diversity and abundance of previously recorded, scientifically significant fossil occurrences from each geologic unit, and the potential for future discoveries (Scott 2012). The PFYC assignments were made by the authors because they were not available from the BLM.

Prior to and during the field survey, the project area was the subject of thorough background research and analysis. The research included geologic map and literature reviews, and previous locality data searches. The purpose of the review was to evaluate the paleontological sensitivity of the project area in order to identify known fossil resources within it and nearby in the same geologic formations. In addition, Sapphos requested a paleontological records search from the Los Angeles County Museum of Natural History (LACM) and the San Bernardino County Museum (SBCM). The purpose of the museum records search was to: 1) determine whether any previously recorded fossil localities occur in the APE, 2) assess the potential for disturbance of these localities during construction, and 3) evaluate the paleontological sensitivity in the APE.

3.4 FIELD SURVEY METHODS

The survey was designed to determine the surface presence of previously unknown significant vertebrate fossils and/or noteworthy occurrences of invertebrate, plant, or trace fossils, and evaluate potential adverse impacts to subsurface paleontological resources during construction.

The surveyed area included the proposed access roads, three staging areas, and a 100-foot buffer, totaling 71.92 acres (APE) (see Figure 1). These portions of the greater project area were selected for pedestrian survey because they have the greatest potential to be impacted during the implementation of the proposed project. The Project APE was inspected for: 1) surface fossils, 2) exposures of potentially fossiliferous rock, and 3) areas in which fossiliferous rock would be exposed or otherwise impacted during construction. Exposures of paleontologically sensitive geologic units received 100 percent pedestrian survey coverage. Upon completion of the survey, conclusions and recommendations were made to address possible impacts to the APE during construction.

3.5 DISTRIBUTION OF DATA

Copies of this report will be submitted to the BLM and Great Basin Unified Air Pollution Control District.

4.0 RESULTS

4.1 LITERATURE SEARCH RESULTS

The project area is located in Owens Valley within the southwestern Great Basin, in eastern California. The approximately 125-mile-long, north-south-trending valley is bordered by the Sierra Nevada Mountains to the West, the White and Inyo Mountains to the East, and the Coso Range to the South. The geologic history of the surrounding mountain ranges records depositional and orogenic events spanning 700 million years from the Precambrian to the Holocene (Knopf and Kirk 1918; Nelson et al. 1991). The orogenic events that have shaped Owens Valley likely began early in the Tertiary and continued through the Holocene (Orme and Orme 2008; Pakiser et al. 1964). Owens Valley was formed as a graben valley between the normal faults of the Sierra Nevada fault system and the oblique normal faults of the Inyo-White Mountain Range (Bacon et al. 2006). Movement along these faults has created a structurally complex basin filled with sediments eroded from the surrounding mountain ranges.

Owens Lake was once part of a larger Pleistocene open-lake system that began to the north in Mono Lake and extended South into China, Panamint and Searles Lakes and finally, Lake Manly. This lake system, considered active until approximately 35 kiloannum (ka), has experienced a number of lake level oscillations. These oscillations, controlled largely by hydroclimatic forcing, changing precipitation, and uplift within the Inyo-White Range, have caused the progressive desiccation of the open basin lake system into a series of closed system playa lakes and salt flats (Orme and Orme 1993; Benson et al. 2002; Bacon et al. 2006; Orme and Orme 2008). While Owens Lake has seen at least two transgressive events, at 14.3 ka and at 12.8 ka, shoreline surveys and core data have shown that the overall lake level has fallen from a late Pleistocene highstand of 1,160 meters (m) at 24 ka to 1,096 m by 1872 (Bacon et al. 2006; Li et al. 2000). Construction of the Los Angeles Aqueduct in 1913 further drained the lake levels, creating the playa lake conditions seen today. The sediments represented within the survey area are reflective of the lake level oscillations and represent the remains of the late Pleistocene highstands of Owens Lake. The lacustrine sediments, which underlie the current APE have been partially covered by distal alluvial fan and eolian deposits.

The project area is underlain by three geologic units (Figure 1): Quaternary lacustrine deposits, which have high paleontological potential (PFYC Class 4), Quaternary alluvium, which has moderate paleontological potential (PFYC Class 3a) if Pleistocene in age, and eolian sediments, which have low paleontological potential (PFYC Class 2). The general geology and paleontologic content of these units is described below.

The Quaternary lakebed deposits represent highstands of Owens Lake during the Pleistocene, and remains of mammoth, horse, camel, carnivore, rabbit, and rodent have been recovered from these sediments in the vicinity of the survey area (McLeod 2011). The Quaternary alluvium found within the project survey area is represented by coarse alluvial fans consisting of clasts of dolomite, quartzite marble, and granitic rocks weathered and washed down from the Inyo Mountains to the East. These sediments are not likely to contain fossils near the surface due to their younger age, though older alluvial deposits could contain fossils at deeper levels (McLeod 2011; Scott 2012). The Quaternary eolian sands within the survey area are represented by actively migrating dune sands. The active dune fields are not likely to contain fossils due to their young age; however, they do lay suprajacent to the Quaternary lakebed deposits which are paleontologically sensitive (Scott 2012).

4.2 RECORDS SEARCH RESULTS

A summary of the data provided by LACM (McLeod 2011), and SBCM (Scott 2012) indicates four localities have been recovered from within 1 mile of the APE. Four of these localities (LACM 7716-7719) have yielded a diverse taxonomic assemblage including bony fish (Teleostei), bird (Aves), jack rabbit (*Lepus*), pocket gopher (*Thomomys*), and even toed ungulate (Artiodactyla) (McLeod 2012). These specimens were collected during previous surveys just outside of the current APE by Cogstone Resource Management Inc. (Gust 2003). Within 5 miles of the APE, the LACM has recorded one locality (LACM 4691) just northwest of the project area near the mouth of the Owens River. This locality yielded the remains of a proboscidean, a mountain lion (*Felis concolor*), horse (*Equus*), and camel (Camelidae) (Jefferson 1989, 1991). The SBCM has two recorded localities (SBCM 6.6.3-6.6.4) from Quaternary alluvium in the same area as LACM 4691. These localities produced the remains of horse (*Equus*), camel (*Camelops*), and bison (*Bison*) (Scott 2012). Smith et al. (2009) reported the remains of a number of fossil fish including suckers (Catostomidae) and minnows (Cyprinidae) from the silty clays and sands of the lakebed approximately four miles to the south of Keeler near the intersection of highways 136 and 190.

4.3 FIELD SURVEY RESULTS

This section of the report presents the results of the field survey which was performed in accordance with BLM standards. The field survey results are presented in Table 1, and photographs of the Project are shown in Figures 2 through 7. No new fossil localities were discovered during the survey of the project area.

Table 1. Project Summary Table for the Keeler Dunes Project Access Roads and Staging Areas.

<table>
<tr><td>Project Name</td><td colspan="5">Keeler Dunes Project Access Roads and Staging Areas</td></tr>
<tr><td>Project Description</td><td colspan="5">Paleontological survey of the proposed access roads and staging areas for the Keeler Dunes Project</td></tr>
<tr><td>Managing Land Agency</td><td colspan="5">Bureau of Land Management, Bishop Field Office; Los Angeles Department of Water and Power</td></tr>
<tr><td>Location (PLSS)</td><td colspan="5">Sections 25 and 36, T 16 S, R 37 E, Section 31, T 16 S, R 38 E</td></tr>
<tr><td>Topographic Map</td><td colspan="5">Dolomite (1987), Owens Lake (1987)</td></tr>
<tr><td>Geologic Map(s)</td><td colspan="5">Stinson, M.C. 1977. Geology of the Keeler 15’ Quadrangle, Inyo County, California: California Division of Mines and Geology, Map Sheet 38, scale 1:62,500
Streitz, R. and Stinson, M.C. 1974. Geologic Map of California: Death Valley Sheet: California Division of Mines and Geology, scale 1:250,000</td></tr>
<tr><td>Geologic Formation(s)</td><td colspan="3">Qs: Dune Sand
Qal: Alluvium
Ql: Quaternary lakebed deposits</td><td>PFYC</td><td>Class 2
Class 2
Class 4</td></tr>
<tr><td>Principal Investigator</td><td colspan="3">Paul C. Murphey</td><td>Permit Number</td><td>CA-12-00-007P</td></tr>
<tr><td>Surveyor(s)</td><td colspan="5">Wayne A. Thompson</td></tr>
<tr><td>Survey Date(s)</td><td colspan="3">July 23, 2013</td><td>Total Acres Surveyed</td><td>71.92</td></tr>
<tr><td>Area Surveyed</td><td colspan="5">The APE is defined as 71.92 acres containing the locations of the proposed access road, three staging areas, and 100-foot buffer.</td></tr>
<tr><td>Topography</td><td colspan="5">Exposed playa lakeshore and lake bottom with active low lying dune fields.</td></tr>
<tr><td>Bedrock Exposure Status</td><td colspan="5">95% exposed as lacustrine sediments, alluvial fan deposits, and actively migrating eolian deposits.</td></tr>
<tr><td rowspan="4">Geological Description (in stratigraphic ascending order from bottom to top)</td><td>Unit</td><td>Lithology</td><td colspan="2">Description</td><td>Thickness (meters)</td></tr>
<tr><td>Qs</td><td>Sand</td><td colspan="2">Brownish-gray, fine grained, well sorted, well rounded unconsolidated eolian sand</td><td>0.5-3.0</td></tr>
<tr><td>Qal</td><td>Alluvium</td><td colspan="2">Grayish-brown, loose, fine grained, poorly sorted, poorly consolidated silt, sand and gravel containing a range of lithic fragments and cobbles.</td><td>1.0</td></tr>
<tr><td>Ql</td><td>Silty sand</td><td colspan="2">Brown-buff, silty very fine-grained sand and silt, moderately consolidated with multiple horizons exhibiting sediment filled mud cracks.</td><td>lower contact covered</td></tr>
</table>

Nearest Previously Documented Fossil Locality	Nearest previously documented localities are LACM 7716-7719.		
Previously Documented Fossil Localities within APE	None		
Results of Previously Recorded Fossil Locality Evaluations	No new paleontological resources observed.		
Fossil Localities Discovered During Survey	No new fossil localities were discovered during the survey.		
New Fossil Description(s)	Non-significant Fossil Occurrences: N/A		
	Significant Fossil Localities: N/A		
Fossil Status of New Specimens	N/A	**Repository of New Specimens**	N/A

Figure 2. View of staging area 1 (PT-130723-01).
Photo direction- northwest.

Figure 3. View of access road showing alluvial sediments partially covered by eolian deposits (PT-130723-02). Photo direction- south.

Figure 4. View of staging area 2 (PT-130723-03).
Photo direction- southeast.

Figure 5. View of staging area 3 (PT-130723-04).
Photo direction- southeast.

Figure 6. View of staging area 3 access road showing lakebed sediment exposures (PT-130723-06). Photo direction- north

Figure 7. View of eolian sediments along the access road (PT-130723-07). Photo direction- northwest.

5.0 RECOMMENDATIONS

In order to demonstrate CEQA compliance, a response to the following question in the Environmental Checklist based on the results of the paleontological analysis is required. "*Will the proposed project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?*" With the implementation of the recommendations listed in Table 2, the Keeler Dunes Project will not directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. The intent of the recommendations is to ensure that potential adverse impacts to paleontological resources as a result of project implementation are reduced to a less than significant level.

Table 2 provides a description of the recommendations for the Project based on the findings of the paleontological assessment, CEQA requirements and BLM guidelines (BLM 1998, 2007, 2008).

Table 2. Project Recommendations.

Project Recommendation Summary	No mitigation measures are recommended for the surface of the project area. Paleontological monitoring is only recommended for areas where subsurface PFYC Class 4 lacustrine deposits will be disturbed during construction. This includes areas where lakebeds are mapped at the surface, as well as areas where these deposits occur at a shallow depth.
Project Recommendation	**Surface:** The results of this survey have determined that no surface fossils are located within the APE. Therefore, no additional paleontological mitigation measures are recommended for the project area surface during construction activities such as the planting of vegetation and placement of temporary wind breaks. **Subsurface:** Because the likelihood of encountering significant subsurface paleontological resources is low, monitoring is not recommended in areas underlain by PFYC Class 2 geologic units during ground disturbance for access road construction. Based on the scientifically significant fossils that were documented during previous field surveys in the vicinity of the APE, and the presence of highly paleontologically sensitive (PFYC Class 4a) Quaternary lacustrine deposits at the surface locally within the APE and subsurface throughout the APE. It is recommended that a BLM-permitted paleontologist monitor construction of all the access roads leading directly into staging areas 1-3 (Figure 8). If any subsurface fossils are encountered during construction and a paleontological monitor is not present, the BLM and a qualified BLM-permitted paleontologist should be notified immediately, and work in the immediate area (100-foot buffer) of the discovery should cease until the significance of the discovery can be evaluated.

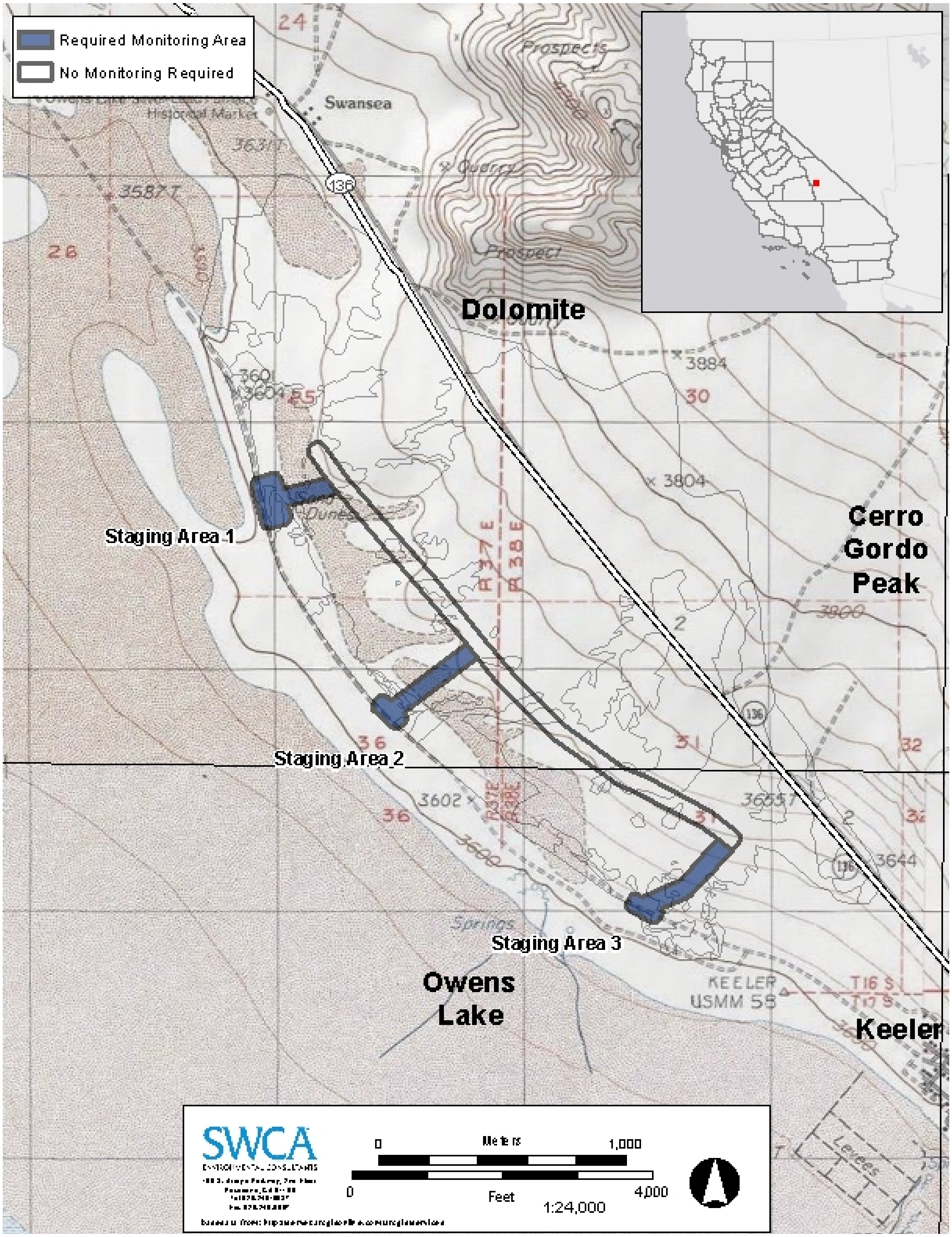

Figure 8. Recommended monitoring locations within the project APE.

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6.0 LITERATURE CITED

Bacon, S. N., Burke, R.M., Pezzopane, S. K., and Jayko, A.S. 2006. Last glacial maximum and Holocene lake levels of Owens Lake, eastern California, USA. Quaternary Science Reviews, 25:1-19.

Benson, L. Kashgarian, M. Rye, R., Lund, S. Paillet, F. , and Smoot, J. 2002. Holocene multidecadal and multicentennial droughts affecting northern California and Nevada. Quaternary Science Reviews, 21: 659-682

Bureau of Land Management (BLM). 1998 (revised). Paleontology Resources Management Manual and Handbook. H-8270-1.

———. 2007. Potential Fossil Yield Classification (PFYC) System for Paleontological Resources on Public Lands. Instruction Memorandum No. 2008-009.

———. 2008. Assessment and Mitigation of Potential Impacts to Paleontological Resources. Instruction Memorandum No. 2009-011.

Gust, S. 2003. Paleontological Assessment Report and Mitigation Plan for the Owens Valley Project, Inyo County, California. Report prepared for Sapphos Environmental, Inc. Pasadena CA. Cogstone Resource Management Inc., Santa Ana, CA.

Hay, O. P., 1927. The Pleistocene of the western region of North America and its vertebrate animals. Carnegie Institute of Washington Publication 322 (B): 1-346.

Jefferson, G. T., 1989. Late Pleistocene and earliest Holocene fossil localities and vertebrate taxa from the western Mojave Desert. *In* J. Reynolds (ed.), The west-central Mojave Desert: Quaternary studies between Kramer and Afton Canyon. Redlands: SBCM Association Special Publication, p. 27-40.

Jefferson, G. T., 1991. A catalogue of late Quaternary vertebrates from California: Part Two, mammals. Natural History Museum of Los Angeles County Technical Reports, No 7.

Knopf, A. and Kirk, E. 1918. A geologic reconnaissance of the Inyo Range and the eastern slope of the southern Sierra Nevada, California, with a section on the stratigraphy of the Inyo Range. United States Geological Survey Professional Paper 110: 1-130.

Li, H-C., and Bischoff, J. L. Ku, T.L., Lund, S. P. and Stott, L. D. 2000. Climate variability in East cCentral California during the past 1000 years reflected by high resolution geochemical and isotopic records from Owens Lake sediments. Quaternary Research 54:189-197

McLeod, S.A.,. 2011. Natural History Museum of Los Angeles County. 07 October 2011. Letter response to Clarus Backus, Sapphos Environmental Inc., Pasadena, CA.

Murphey, P. C., and D. Daitch. 2007. Paleontological overview of oil shale and tar sands areas in Colorado, Utah and Wyoming. U.S. Department of Energy, Argonne National Laboratory. Report prepared for the U.S. Department of Interior Bureau of Land Management, 468 p. and 6 maps (scale 1:500,000).

Nelson, C.A., Hall Jr. C.A. and Ernst, W.G. 1991. Geologic history of the White-Inyo Range. *In* Hall Jr. C.A. (ed.) Natural History of the White-Inyo Range Eastern California, University of California Press, Berkeley. Pp. 42-74.

Orme, A. R. and Orme, A.J. 1993. Late Pleistocene oscillations of Lake Owens, eastern California. Geological Society of America Abstracts with Programs, 25: 129-130.

———. 2008. Late Pleistocene shorelines of Owens Lake, California and their hydrodynamic and tectonic implications. *In* Reheis, M.C., Herschler, R., and Miller, D.M., eds, Late Cenozoic Drainage History of the Southwest Great Basin and Lower Colorado River Region: Geologic and Biotic Perspectives. Geologic Society of America Special Paper 438, p. 207-225.

Pakiser, L. C., Kane, M.F., and Jackson, W.H. 1964. Structural geology and volcanism of the Owens Valley region California-A geophysical study. United States Geological Survey Professional Paper 438.:1-67

Scott, E., 2012. San Bernardino County Museum, Redlands, CA. 28 February, 2012. Letter response to Tiffany Clark, Sapphos Environmental Inc., Pasadena, CA.

Smith, G.R., Reynolds, R.E., and Serrano, R. J. 2009. Recent records of fossil fish from eastern Owens Lake, Inyo County, California. *In* Reynolds, R.E. and Jessey, D.R. eds, Landscape Evolution at an active plate margin. The 2009 Desert Symposium Field Guide and Proceedings. California State University Desert Studies Symposium and LSA Associates Inc. Pp. 176-183

Stinson, M.C. 1977. Geology of the Keeler 15' Quadrangle, Inyo County, California: California Division of Mines and Geology, Map Sheet 38, scale 1:62500

Streitz, R. and Stinson, M.C. 1974. Geologic Map of California: Death Valley Sheet: California Division of Mines and Geology, scale 1:250,000

GEORGIA KNAUSS, B.S.
Paleontologist/Geologist

SWCA ENVIRONMENTAL CONSULTANTS

Years of Experience

14

Expertise

Paleontological and geological field techniques

Fossil preparation, curation, and data management

Paleontological mitigation plans and research designs for surface disturbing projects

Federal paleontology permitting and policy

Paleontology of Late Cretaceous, Paleocene, Eocene, and Oligocene epochs

Trimble GPS/GIS

Education

M.S., University of Iowa, coursework completed; thesis in progress

B.S., Geology, South Dakota School of Mines and Technology, 2003

Affiliations

Geological Society of America (GSA), Member

Sigma Xi, Member

Society of Vertebrate Paleontology (SVP), Member

Experience Summary

Ms. Knauss is a Paleontologist with experience in paleontological surveys, excavations, and fossil preparation. As a Paleontologist with SWCA, Ms. Knauss' responsibilities include coordination, organization, and implementation of paleontological field projects including surveys, monitoring, excavations and salvages; documentation of fossil localities including their stratigraphic provenance and geographic location; collection, and identification of fossils; development and implementation of paleontological mitigation plans; compilation of field data; fossil preparation, analysis of field data, literature and museum locality research, preparation of technical reports and NEPA documents for projects throughout the western United States. Ms. Knauss' project experience includes paleontological resource work for block area resource inventories, natural gas and oil well pads, pipelines, transmission lines, geophysical investigations, wind farms, railways, and roads, for a variety of private and public sector clients.

Selected Project Experience

Niobrara 3D Seismic projects (1B and 1D); Colorado; Geokenetics USA, Inc. Paleontological field surveys and assessment of seismic lines and associated infrastructure on the Pawnee National Grasslands in northeastern Colorado in advance of seismic exploration activities to identify significant paleontological resources. *Role: Paleontologist. Helped with additional assessment of fossil localities and recovery of some significant fossils.*

Piceance Creek 3D Geophysical Investigation; Rio Blanco County, Colorado; St. Croix Seismic: Rocks of the Eocene Wasatch and Green River formations were examined within the Piceance Creek Basin. Fossils were recorded at approximately 38 localities. Fossils were then prepared and curated at a designated repository, and a technical report was prepared. *Role: Paleontologist/Technical Author. Conducted a paleontological resource assessment, and developed and implemented a mitigation plan for the geophysical investigation.*

Ryan Gulch 3D Geophysical Investigation; Rio Blanco County, Colorado; Williams Production RMT Company. Rocks of the Eocene Wasatch and Green River formations were examined within the Piceance Creek Basin. Fossils were recorded at approximately 26 localities. Fossils were then prepared and curated at a designated repository, and a technical report was prepared. *Role: Paleontologist. Conducted a paleontological resource assessment, and developed and implemented a mitigation plan for the geophysical investigation for an approximately 120-square-mile project area.*

Newfield Exploration Co. Block surveys on Uintah and Ouray Tribal Land; Uintah and Duchesne counties, Utah (2007–2009): Paleontological assessment in the Eocene-age Uinta Formation, which included a field survey of nearly 33 sections. The results of the assessment and field survey were compiled into a final report. *Role: Paleontologist/Technical Author. Conducted paleontological assessments and field surveys.*

PAUL MURPHEY, PH.D.

Principal Investigator/Paleontologist

Years of Experience:

17

Expertise

Eocene continental biostratigraphy and biochronology

Vertebrate paleoecology and taphonomy

Paleontological and geological field techniques

Fossil preparation, curation, and data management

Paleontological mitigation plans and research designs for surface disturbing projects

Design of interpretive displays

Education

Ph.D., Geological Sciences, emphasis in Paleontology, University of Colorado, 2001

M.S., Geological Sciences, University of Colorado, 1995

B.A., Anthropology/ Biology, University of Colorado, 1991

Registrations/ Certifications

BLM Paleontological Resources Use Permit, Colorado, survey and limited surface collection, consulting statewide (C-60240, Renewal)

BLM Paleontological Resources Use Permit, Colorado, survey and limited surface collection, consulting (C-60180)

Experience Summary

Dr. Murphey is the Principal Investigator for the Paleontology Program at SWCA. He has 17 years of experience as a principal investigator for numerous paleontological resource management projects throughout the western United States and has 12 years of employment experience in natural history museums. Dr. Murphey has directed numerous field expeditions and has published on paleontological, geological, and biological research projects. Currently permitted in eight western states by various federal and state agencies, his range of experience in paleontological resource management includes directing paleontological field surveys of all sizes; development of resource mitigation plans including monitoring, excavations, and salvages; fossil preparation and museum curation; coordination with agencies; and the training, oversight, and coordination of SWCA's paleontological staff in the western U.S. Dr. Murphey has served as an expert witness in public hearings involving paleontological resources, and has been an invited speaker at museums in Colorado, Utah and California. Dr. Murphey is currently spearheading a cooperative effort between mitigation paleontologists, government agencies, and museums to develop and publish comprehensive best management practices for paleontological impact mitigation.

Selected Project Experience

Niobrara 3D Seismic projects (1B and 1D); Colorado; GeoKinetics USA, Inc. SWCA provided paleontological field surveys and assessment of seismic lines and associated infrastructure on the Pawnee National Grasslands in northeastern Colorado in advance of seismic exploration activities to identify significant paleontological resources. *Role: Principal Investigator. Oversaw field surveys and assisted with recovery of some significant fossils*

Paleontology Surveys; Uintah County, Utah. SWCA provided paleontological survey services to fulfill permitting requirements for oil and gas exploration located on the Ute (Uintah and Ouray) Tribal lands within the Uintah and Ouray Reservation in the Uinta Basin, Utah. SWCA researched existing paleontological localities, and conducted block surveys of 24,000 acres. *Role: Principal Investigator. Client: Newfield Production Company.*

UBET Piceance Paleontological Services; Rio Blanco County, Colorado UBET Wireless. SWCA completed services for UBET Wireless, with respect to paleontological construction monitoring of work at an existing telecommunications tower site in Rio Blanco county (T2S/R96W Section 18). These services were designed to satisfy the U.S. Bureau of Land Management White River Field Office's (BLM-WRFO) responsibilities under Section 106 of the National Historic Preservation Act, as amended, and the National Environmental Policy Act (NEPA). BLM-WRFO had stipulated that excavations related to facility construction and expansion be monitored by a qualified professional paleontologist. *Role: Principal Investigator. Oversaw monitoring of land clearance and trenching for placement grounding lines for cell phone tower.*

PAUL MURPHEY, PH.D.
Principal Investigator/Paleontologist

State of Colorado Paleontological Permits 99-24, 2000-18, 2000-22, 2001-22, 2002-19, 2003-30, 2004-28, 2004-47, 2005-34, 2006-5, 2007-33, 2008-36, 2008-046, 2009-58, 2009-59, 2010-62, 2010-68, 2011-52, 2011-69; 2012-79; 2012-80

Certified Paleontologist, County of Orange, California

Paleontological Resource Specialist, California Energy Commission

Qualified Paleontologist, City and County of San Diego, California

Certified Paleontologist, County of Riverside, California

Research Associate, Biodiversity Research Center of the Californias, San Diego Natural History Museum

Research Associate, Earth Sciences Department, Denver Museum of Nature and Science

Affiliations

Paleontological Society, Member

Society of Vertebrate Paleontology, Member

Society for Sedimentary Geology, Member

Geological Society of America , Member

Women's Environmental Council, Member

Paleontological Assessment, Boulder West Trail Study Area; Boulder County, Colorado; City of Boulder Open Space and Mountain Parks.. SWCA identified and evaluated sensitive paleontological resources for planning purposes. Its goal was not only to provide mitigation recommendations such as avoidance or collection, but also to evaluate the paleontological resources and associated sedimentary features for potential inclusion in educational and interpretive programs. *Role: Principal Investigator. Oversaw and assisted in conducted paleontological assessment for trail improvement and potential visitor center.*

White River Dome Paleo; Rio Blanco County, CO. Client: Whiting Petroleum Corporation. SWCA conducted cultural and paleontological surveys on an approximately 250 mile long seismic survey in the Piceance Creek Basin of Colorado. *Role: Paleontology Specialist. Oversaw paleontological resource surveys, GIS data, and field crews.*

Genesis Solar Energy Project Monitoring; Blythe, Riverside County, California; AECOM. SWCA provided paleontological monitoring and mitigation duties for the duration of ground disturbing activities during construction at NextERA's Genesis Solar Energy Project west of Blythe, CA. The project area includes a 7 mile access road and two solar fields boasting a total of 22,000 parabolic mirrors for a total power output of 250 Megawatts. *Role: Principal Investigator. Assisted in research of pertinent geologic and paleontological literature resources, full time monitoring of drilling, grading, and excavation activities, and collection and identification of significant fossil resources.*

SWCA ENVIRONMENTAL CONSULTANTS

WAYNE THOMPSON, PH.D.

Paleontologist

Years of Experience:
11

Expertise

Pleistocene faunal recovery and identification

Paleontological mitigation and Monitoring

Fossil preparation and curation

Geologic Mapping

Biostratigraphy and Phylogeny of Tylosaurine Mosasaurs

Geology and Paleontology of the Late Cretaceous Western Interior Seaway

Eocene and Oligocene Biostratigraphy of the White River Badlands of South Dakota

Education

Ph.D., Geology and Geologiacl Engineering, South Dakota School of Mines and Technology; South Dakota, 2011

M.S., Paleontology, South Dakota School of Mines and Technology; South Dakota, 2005

B.S., Geology and Biology, Old Dominion University; Virginia, 2002

Affiliations

Society of Vertebrate Paleontology

Geological Society of America

Paleontological Society

Experience Summary

Dr. Thompson is a paleontologist with experience in the paleontological, geological and biological sciences. As a field investigator, instructor, and laboratory technician, Dr. Thompson has developed a thorough background in the paleontological sciences. Dr. Thompson has conducted numerous paleontological field surveys, functioned as a field crew chief, overseen paleontological fieldwork, supervised field staff, and coordinated numerous field studies. His experience in environmental consulting and mitigation paleontology includes conducting paleontological monitoring for numerous construction projects. He is a Qualified Professional Paleontologist under the standards of the Society for Vertebrate Paleontology.

As a field paleontologist, Dr. Thompson has conducted block surveys and monitored construction activities for a variety of energy projects including solar developments, 3-D seismic exploration projects, gas and oil pipeline development, and high voltage transmission line projects. In addition to his doctoral research on Late Cretaceous marine reptiles of the Pierre Shale in South Dakota, Dr. Thompson has experience conducting paleontological investigations on Pleistocene micro and megafauna throughout much of the western United States, including California, Oregon, Nevada and South Dakota, as well as work in many other formations throughout the western United States and abroad including Nevada, South Dakota Wyoming, Colorado, Montana, North Dakota, Utah, and Antarctica.

Selected Project Experience

White River Dome Paleo; Rio Blanco County, CO. Client: Whiting Petroleum Corporation. SWCA conducted cultural and paleontological surveys on an approximately 250 mile long seismic survey in the Piceance Creek Basin of Colorado. *Role: Paleontology Specialist. Conducted paleontological resource surveys, prepared daily reports, ensured quality of GIS data, supervised crew members, and prepared daily surveying plans for field crews.*

Genesis Solar Energy Project Monitoring; Blythe, Riverside County, California; AECOM. SWCA provided paleontological monitoring and mitigation duties for the duration of ground disturbing activities during construction at NextERA's Genesis Solar Energy Project west of Blythe, CA. *Role: Paleontological Specialist. Conducted site visits, provided data QA/QC support, and assisted with identification of significant fossil resources*

ON Line Paleontological Monitoring; Clark County, Nevada; HDR, Inc. SWCA provided paleontological resources mitigation monitoring program for this approximately 230-mile long power transmission line project located in eastern Nevada. SWCA paleontologists reviewed all previously prepared paleontological assessment and survey reports and presented the Bureau of Land Management (BLM) with a Paleontological Resources Mitigation Monitoring Plan for approval. *Role: Paleontology Specialist. Assisted with construction monitoring, data analysis and preparation of final monitoring report.*

APPENDIX G
PHASE I ENVIRONMENTAL SITE ASSESSMENT

KEELER DUNES DUST CONTROL PROJECT
PHASE I ENVIRONMENTAL SITE ASSESSMENT

Prepared for:

Great Basin Unified Air Pollution Control District
157 Short Street, Suite 6
Bishop, California 93514

Prepared by:

Sapphos Environmental, Inc.
430 North Halstead Street
Pasadena, California 91107

March 21, 2014

TABLE OF CONTENTS

FIGURES ***FOLLOWS PAGE***

APPENDICES

SECTION 1.0
INTRODUCTION

1.1 PROJECT BACKGROUND

The Great Basin Unified Air Pollution Control District (District) regulates fugitive dust (in the form of particulate matter that is 10 microns or less in size [PM_{10}]), emissions in the Owens Valley Planning Area (OVPA), which includes the Keeler Dunes area, consistent with the requirements of the National Ambient Air Quality Standards (NAAQS). In January 1993, the United States Environmental Protection Agency (U.S. EPA) classified the Owens Valley as a serious nonattainment area for PM_{10}. The Owens Lake bed and surrounding areas have been the largest single source of PM_{10} emissions in the United States, with annual PM_{10} emissions of more than 80,000 tons and 24-hour concentrations as high as 130 times the federal air quality standard. The air pollution at Owens Lake is caused by wind dispersing exposed dry lake bed sediments into the air. These sediments were exposed as a result of the lowering of Owen's Lake due to water diversions from the Owens River and other streams that once flowed into Owens Lake. By the 1920s, all that remained of the lake was a 26-square-mile hyper-saline brine pool, and by 1924, Owens Lake was virtually dry.[1] The Federal Clean Air Act required that the District produce a State Implementation Plan (SIP) in 1997 that detailed how the PM_{10} problem would be brought into conformance with federal standards.

The District signed an agreement with the City of Los Angeles in 1998 that set a schedule for implementing controls. These controls were approved by U.S. EPA. The PM_{10} levels were required to be reduced to the federal standard by 2006 or the District would be subject to federal sanctions, which could include withholding of federal highway funds. The District's 2003 SIP revision required a total of 29.8 square miles to be controlled by the end of 2006 and additional areas, if necessary, to meet the standard as they are verified. In 2006, an additional 12.7 miles of dust controls were ordered by the District. The 2008 SIP was prepared due to a finding by the U.S. EPA that the OVPA did not attain the 24-hour NAAQS for PM_{10} by December 31, 2006. The 2008 SIP requires that the NAAQS can be attained by March 23, 2017 (CAAA §179[d][3]).

Approved Best Available Control Measures (BACMs) for control of dust on Owens Lake include shallow flooding; managed vegetation; gravel cover; and combinations of these methods, termed a hybrid. Shallow flooding composes approximately 87 percent of the existing 42 square miles of dust control measures (DCMs) implemented on the lake bed with managed vegetation and gravel cover composing the remainder as of December 2012.[2]

The 2008 SIP also incorporates provisions of the 2006 Settlement Agreement between the District and the Los Angeles Department of Water and Power (LADWP) to expand DCMs to additional areas at Owens Lake in order to attain the NAAQS as soon as practicable.[3] The 2008 SIP noted Keeler Dunes as one of the off-lake bed areas consistently exceeding NAAQS and state standards

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[1] Great Basin Unified Air Pollution Control District. January 2008. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan—Final Subsequent Environmental Report*. Prepared by: Sapphos Environmental, Inc., Pasadena, CA. Bishop, CA.

[2] The 42-square-mile dust control area includes the 2-square-mile Phase 8 Gravel and the 0.6-square-mile sand fence area in T1A-1.

[3] Great Basin Unified Air Pollution Control District and City of Los Angeles Department of Water and Power. November 2006. Settlement Agreement Resolving City's Challenge to the District's Supplemental Control Requirement (SCR) Determination for the Owens Lake Bed. Los Angeles, CA.

for PM_{10}. The Keeler Dunes is located adjacent to Owens Lake, immediately north-northwest of the community of Keeler, California. Sand and dust from the Keeler Dunes become mobile during high-wind events and, since dust sources on the bed of Owens Lake are about 90 percent controlled, constitute one of the last main dust sources contributing to exceedances of the state and federal 24-hour PM_{10} standard in the communities of Keeler and Swansea.[4] As a result of data collected since April 2000, the District has identified the Keeler Dunes as one of the areas that need to be controlled to attain the NAAQS for PM_{10} within the OVPA. The Keeler Dunes have continued to cause an average of six PM_{10} standard exceedances every year since 1993.

1.2 SITE LOCATION

The subject property encompasses an approximately 1.36-square-mile area of land, located immediately north-northwest of the community of Keeler, California, and east of the historic 110-square-mile (70,000-acre) Owens Lake bed within the Owens Valley, Inyo County, California (Figure 1.2-1, *Regional Vicinity Map*). The Keeler Dunes Dust Control Project (proposed project / proposed action) site is located approximately 10 miles southeast of the town of Lone Pine and approximately 65 miles southeast of the City of Bishop. The proposed project / proposed action is located approximately 10 miles west of Death Valley National Park, approximately 11 miles east of Sequoia National Park, and approximately 48 miles north of the City of Ridgecrest (Figure 1.2-1).

The community of Swansea to the north, the community of Keeler to the southeast, and the town of Lone Pine to the northwest are in the vicinity of the proposed project / proposed action located in the unincorporated area of Inyo (Figure 1.2-2, *Project Location Map*). The location of the proposed project / proposed action is depicted on the U.S. Geological Survey (USGS) 7.5-minute series Dolomite,[5] and Owens Lake[6] topographic quadrangles (Figure 1.2-3, *Topographic Map with USGS 7.5-minute Quadrangle Index [1987]*). The topography of the proposed project / proposed action site consists of sand sheets and sand dunes.

Most of the land on which the proposed project / proposed action site is located is owned by the federal government and is under the jurisdiction of the Bureau of Land Management (BLM). The Los Angeles Department of Water and Power (LADWP) also owns a portion of the subject property. Other stakeholders include Inyo County, the local Lone Pine-Paiute Shoshone Tribes, Caltrans District 9, Southern Pacific Railroad, Keeler Community Services District, and Keeler residents.

1.3 SITE SURVEY INSPECTION DATE

The subject property and its adjacent properties were inspected on July 24, 2013, and February 19, 2014.

1.4 INDIVIDUAL PERFORMING THE PHASE I ENVIRONMENTAL SITE ASSESSMENT

Mr. André A. Anderson, REPA, CEC, CES, senior environmental compliance specialist of Sapphos Environmental, Inc., performed the Phase I Environmental Site Assessment of the subject property.

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[4] Great Basin Unified Air Pollution Control District. 28 January 2008. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan*. Bishop, CA.

[5] U.S. Geological Survey. 1987. *7.5-minute Series, Dolomite, California, Topographic Quadrangle*. Denver, CO.

[6] U.S. Geological Survey. 1987. *7.5-minute Series, Owens Lake, California, Topographic Quadrangle*. Denver, CO.

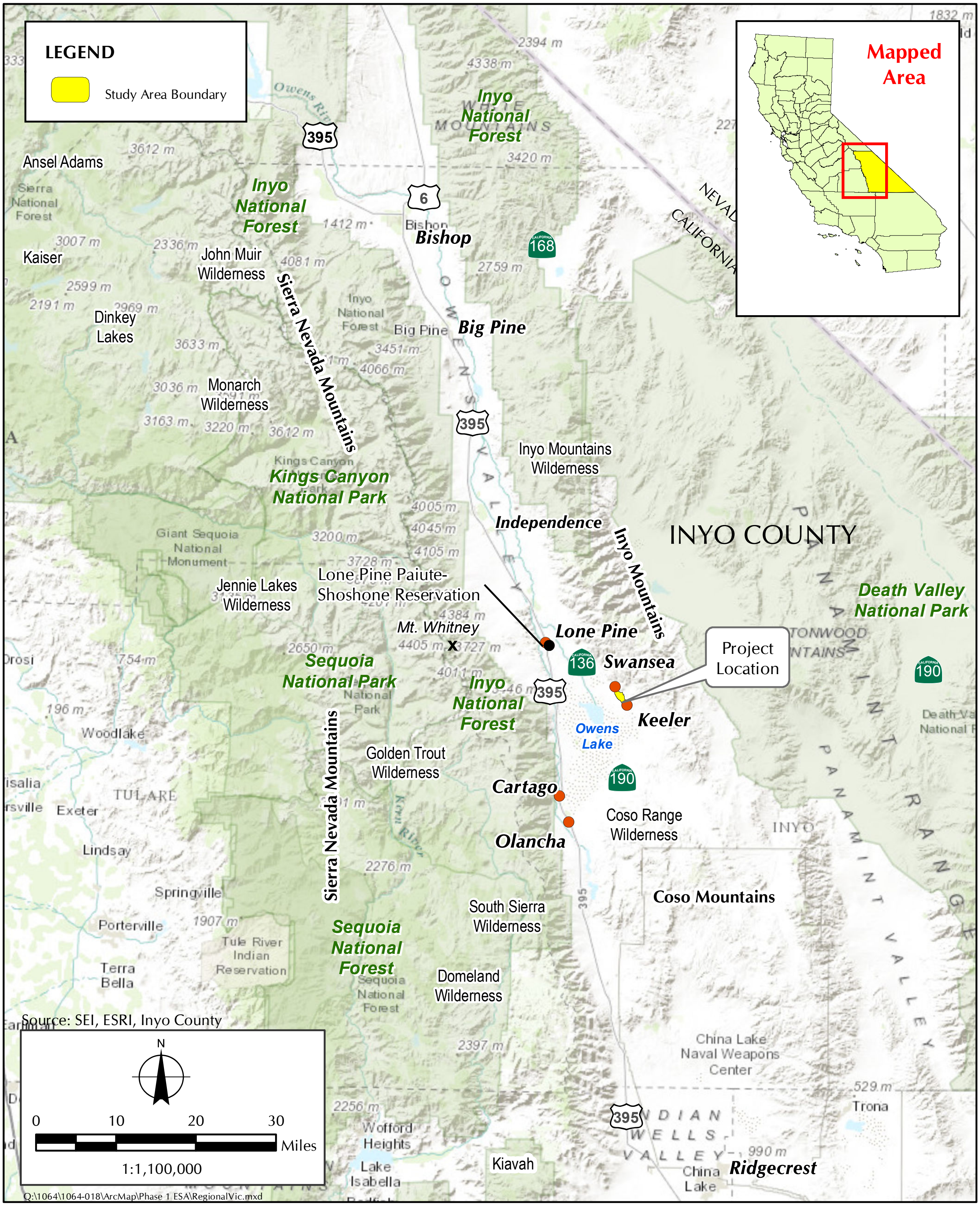

FIGURE 1.1-1

Regional Vicinity Map

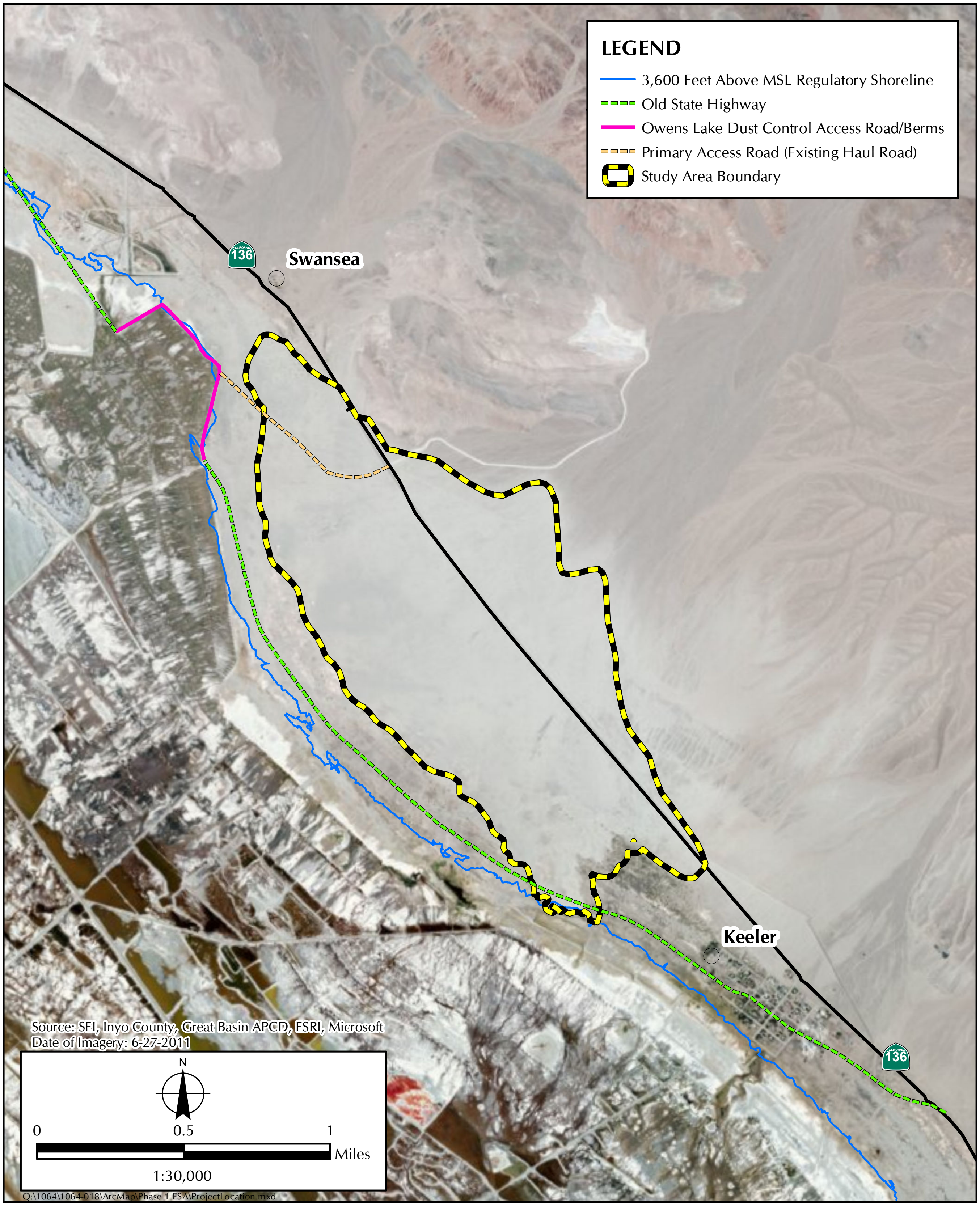

FIGURE 1.1-2

Project Location Map

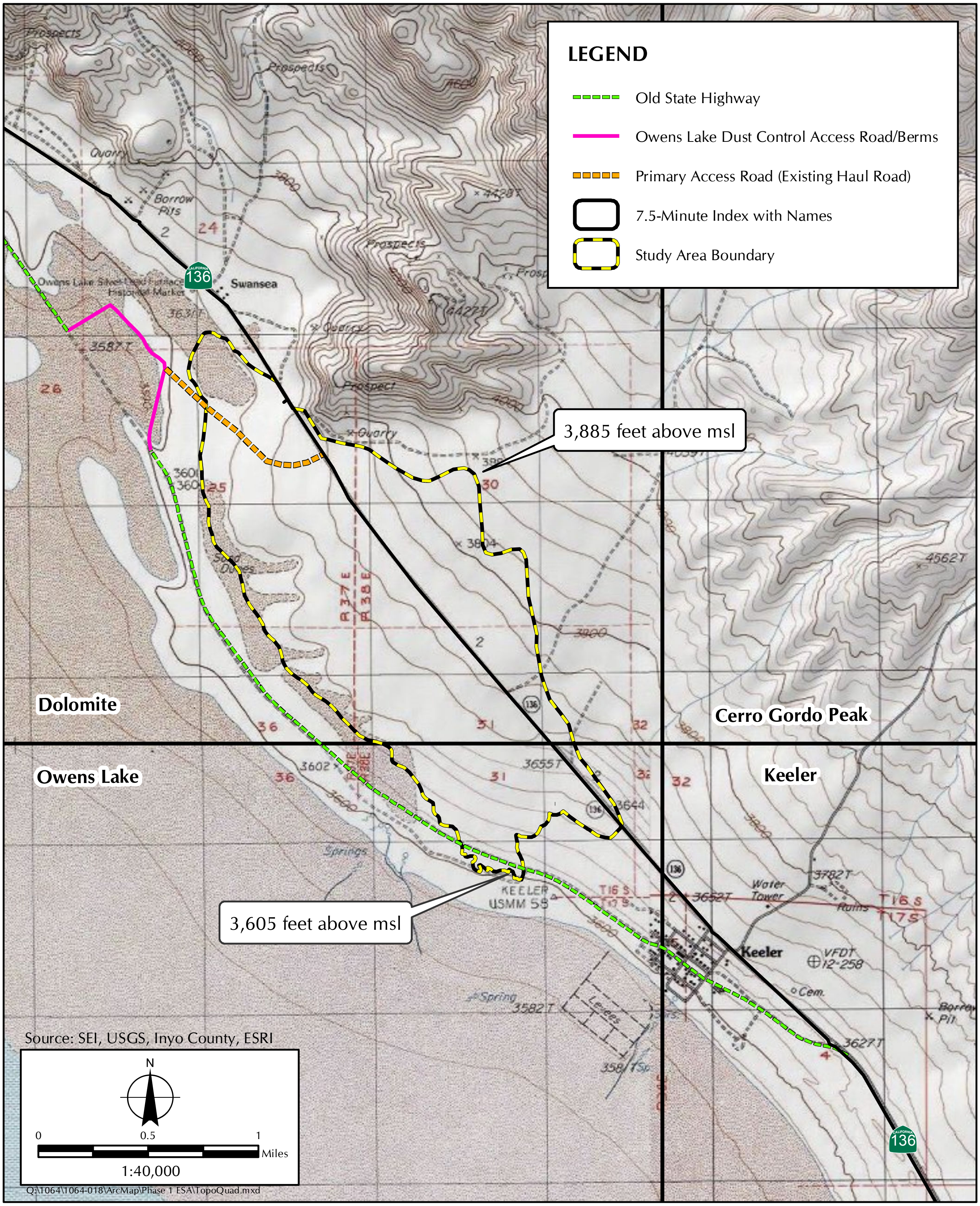

FIGURE 1.1-3

Topographic Map with USGS
7.5-Minute Quadrangle Index

SECTION 2.0
OBJECTIVES AND LIMITATIONS

2.1 PURPOSE

The purpose of this Phase I Environmental Site Assessment (ESA) is to determine the existence or potential for existence of recognized environmental conditions (RECs) at, or adjacent to, the 1.36-square-mile subject property. RECs include, but are not limited to, the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release into structures on the property or into the ground, groundwater, or surface water of the property. This Phase I ESA has been conducted in accordance with the American Society of Testing and Materials (ASTM) Standard E 1527-05, *"Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process,"* in order to satisfy 40 CFR Part 312 as required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

2.2 SCOPE OF SERVICES

The scope of work for this Phase I ESA comprises five key tasks:

- Visual inspection of the accessible portions of the subject property and improvements to observe current uses of the subject property and adjacent properties for evidence of existing, potential, or suspected contamination and/or the presence of hazardous substances

- Review of local, tribal, state, and federal environmental regulatory databases to assess the potential for the subject property to be considered or affected by potential, known, or suspected hazardous waste sites; contaminated soil, surface water or groundwater; or leaking underground storage tanks within the standard radius from the property as specified by the ASTM Standard E1527-05[1]

- Review of reasonably available historical information, including aerial photographs, fire insurance maps, topographic maps, city directory abstracts, other relevant city and/or county records, property owner(s) interviews, previous environmental investigations, and/or ownership records

- Review of reasonably accessible local building, planning, and/or public works records

- Preparation of a report documenting the findings, opinions, and conclusions regarding observed or potential environmental concerns

[1] American Society for Testing and Materials. 1 November 2005. Standard E 1527-05, *"Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process."*

2.3 SIGNIFICANT ASSUMPTIONS

No significant assumptions were made during the preparation of this update of the Phase I ESA.

2.4 LIMITATIONS AND EXCEPTIONS

Physical testing for herbicides/pesticides, asbestos, lead-based paint, radon gas, vapor intrusion, any other known hazardous materials, or carcinogens were not deemed to be warranted as a result of the records search and field inspection and were not performed, in conjunction with this Phase I ESA.

2.5 USER RELIANCE

This report was prepared by, or under the supervision of, an environmental professional in accordance with ASTM Standard E 1527-005, Appendix X2, *Definition of Environmental Professional and Relevant Experience Thereto, Pursuant to 40 CFR 10*. No warranty, expressed or implied, is made by Sapphos Environmental, Inc.

This Phase I ESA report has been prepared solely for the use and benefit of the Great Basin Unified Air Pollution Control District (District) and the U.S. Department of the Interior Bureau of Land Management (BLM). The scope of work described herein is not intended to be used by any individual, entity, or company other than the District and BLM, and such use is expressly prohibited without written consent of the District; BLM; and Sapphos Environmental, Inc.

This report is intended to serve as a screening device for environmental risk associated with present and past property uses. It should be noted that the degree of examination represented by a Phase I ESA is not intended to be used as an exhaustive and comprehensive investigation for every conceivable and possible environmental hazard, and Sapphos Environmental, Inc. does not make any such assertion. No claim is made for the actual existence or nonexistence of hazardous substances at the subject property or adjacent sites. Sapphos Environmental, Inc. makes no representation or warranty regarding the accuracy, quality, or completeness of any information provided by governmental agencies or other third-party entities used in the preparation of this report.

This report is intended to be used in its entirety. No excerpts may be taken to be representative of the findings of this investigation.

SECTION 3.0
SITE OVERVIEW

The proposed project / proposed action site, which is undeveloped, is located on lands administered by the BLM, the LADWP, California Department of Transportation (Caltrans) right-of-way, and the Keeler Community Service District (KCSD) well site. The proposed project / proposed action site is approximately 194 acres in size and is located within a 1.36-square-mile (870-acre) project study area. The proposed project / proposed action study area is located on the Keeler alluvial fan situated between the base of the Inyo Mountains to the east-northeast and the dried bed of Owens Lake to the west-southwest. The proposed project / proposed action study area extends approximately 2.5 miles to the northwest from the community of Keeler and is bisected by California State Route (SR) 136. The elevation of the site ranges from approximately 3,600 feet above mean sea level (MSL) to approximately 3,885 feet above MSL. Undeveloped land was observed on adjacent properties to the north, east, south, and west.

The proposed project / proposed action consists of installation and monitoring of a dust control measure (DCM), consisting of straw bales and native vegetation, on 194 acres within a total study area of approximately 870 acres of active and mobile sand deposits. Construction would require four staging areas and a temporary access route from each staging area to the proposed project / proposed action site.

There are also six proposed project / proposed action alternatives including a no project / no action alternative. The difference between the proposed project / proposed action and proposed project / proposed action alternatives include differences in the amount of area controlled as well as the source of water and method of irrigation for the native vegetation. The proposed project / proposed action involves DCMs applied to 194 acres using irrigation water transported by water trucks from the Fault Test (FT) well to staging areas and transferred to all-terrain vehicle (ATV) trailer tanks. Alternatives 1 and 2 are the same as the proposed project / proposed action with an increase in DCMs applied to 214 and 197 acres, respectively. Alternative 3 involves DCMs applied to 194 acres using a combination of irrigation water delivers by temporary aboveground polyvinyl chloride (PVC) pipelines and manual watering in selected areas. Alternative 3 also involves the placement of on-site 20,000-gallon water tanks within the staging areas along the Old State Highway. Alternative 4 involves dust control measures applied to 194 acres using water transported by water trucks to roadside staging areas off of State Route 136 for direct connection to a combination of irrigation water delivered by temporary aboveground PVC pipelines and manual watering in selected areas. Alternative 5 involves DCMs applied to 194 acres using water supplied via the existing Keeler Community Services District (KCSD) well/pipeline and delivered using a combination of irrigation water delivered by temporary aboveground PVC pipelines and manual watering in selected areas. Under Alternative 6, no DCMs would be implemented at the Keeler Dunes.

This Phase I ESA covers the entire area for the proposed project / proposed action study area and the six proposed project / proposed action alternatives.

The District regulates fugitive dust (in the form of particulate matter that is 10 microns or less in size [PM_{10}]), emissions in the OVPA, which includes the Keeler Dunes area, consistent with the requirements of the NAAQS. In January 1993, the U.S. EPA classified the Owens Valley as a serious nonattainment area for PM_{10}. The dried Owens Lake bed has been the largest single source of PM_{10} emissions in the United States, with annual PM_{10} emissions of more than 80,000 tons and

24-hour concentrations as high as 130 times the federal air quality standard. The air pollution at Owens Lake is caused by wind dispersing exposed dry lake bed sediments into the air. These sediments were exposed as a result of diversion of water from the Owens River and other streams that once flowed into Owens Lake. By the 1920s, all that remained of the lake was a 26-square-mile hyper-saline brine pool, and by 1924, Owens Lake was virtually dry.[1] The Federal Clean Air Act required that the District produce a SIP in 1997 that detailed how the PM_{10} problem would be brought into conformance with federal standards.

The District signed an agreement with the City of Los Angeles in 1998 that set a schedule for implementing controls. These controls were approved by U.S. EPA. The PM_{10} levels were required to be reduced to the federal standard by 2006 or the District would be subject to federal sanctions, which could include withholding of federal highway funds. The District's 2003 SIP revision required a total of 29.8 square miles to be controlled by the end of 2006 and additional areas, if necessary, to meet the standard as they are verified. In 2006, an additional 12.7 miles of dust controls were ordered by the District. The 2008 SIP was prepared due to a finding by the U.S. EPA that the OVPA did not attain the 24-hour NAAQS for PM_{10} by December 31, 2006. The 2008 SIP requires that the NAAQS can be attained by spring 2018 (CAAA §179[d][3]).

Approved BACMs for control of dust on Owens Lake include shallow flooding; managed vegetation; gravel cover; and combinations of these methods, termed a hybrid. Shallow flooding composes approximately 87 percent of the existing 42 square miles of DCMs implemented on the lake bed with managed vegetation and gravel cover composing the remainder as of December 2012.[2]

The 2008 SIP also incorporates provisions of the 2006 Settlement Agreement between the District and the LADWP to expand DCMs to additional areas at Owens Lake in order to attain the NAAQS as soon as practicable.[3] The 2008 SIP noted Keeler Dunes as one of the off-lake bed areas consistently exceeding NAAQS and state standards for PM_{10}. The Keeler Dunes is located adjacent to Owens Lake, immediately north-northwest of the community of Keeler, California. Sand and dust from the Keeler Dunes become mobile during high-wind events and, since dust sources on the bed of Owens Lake are about 90 percent controlled, constitute one of the last main dust sources contributing to exceedances of the state and federal 24-hour PM_{10} standard in the communities of Keeler and Swansea.[4] As a result of data collected since April 2000, the District has identified the Keeler Dunes as one of the areas that need to be controlled to attain the NAAQS for PM_{10} within the OVPA. The Keeler Dunes have continued to cause an average of six PM_{10} standard exceedances every year since 1993.

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[1] Great Basin Unified Air Pollution Control District. January 2008. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan—Final Subsequent Environmental Report*. Prepared by: Sapphos Environmental, Inc., Pasadena, CA. Bishop, CA.

[2] The 42-square-mile dust control area includes the 2-square-mile Phase 8 Gravel and the 0.6-square-mile sand fence area in T1A-1.

[3] Great Basin Unified Air Pollution Control District and City of Los Angeles Department of Water and Power. November 2006. Settlement Agreement Resolving City's Challenge to the District's Supplemental Control Requirement (SCR) Determination for the Owens Lake Bed. Los Angeles, CA.

[4] Great Basin Unified Air Pollution Control District. 28 January 2008. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan*. Bishop, CA.

SECTION 4.0
SITE INSPECTION

4.1 SITE OBSERVATIONS

The subject property encompasses a 1.36-square-mile (870-acre) area. The subject property slopes gently downward from northwest to southeast, but is generally flat. The proposed project / proposed action area is situated on the western portion of the Keeler alluvial fan between the Inyo Mountains to the east-northeast and the dried bed of Owens Lake to the west-southwest.

The site inspection was performed by driving along SR 136, which bisects the property from northwest to southeast; a primary access route and the Owens Lake Dust Control Access Road at the northern end of the subject property; and the Old State Highway, which runs along the southwest boundary of the subject property (Figure 4.1-1, *Phase I ESA Survey Locations*). Representative photographs of the subject property are provided in Appendix A, *Site Photographs*.

The subject property consists of the following 13 Inyo County Assessor parcel numbers (APNs):

- 026-230-13
- 026-230-23
- 026-240-06
- 026-240-15
- 026-240-17
- 026-270-18
- 026-240-19
- 027-270-06
- 027-270-08
- 027-270-13
- 027-270-14
- 027-270-17
- 031-010-14

The entire subject property and its adjacent properties are undeveloped and covered by sparse vegetation. The Inyo County Waste Management Keeler Transfer Station (Survey Location 8) is located approximately 0.25 mile to the southeast of the subject property. This transfer station is a collection point for non-hazardous municipal waste which is disposed at an off-site municipal landfill.

The Keeler Dunes area consists of sand sheets with several active sand dune areas. A water diversion structure, which was built by the California Department of Transportation to divert runoff from the area upslope of the highway, is located east of the paved roadway.

The Keeler Dunes area is characterized by a Desert Scrub plant community. Portions of the area west of SR 136 are largely devoid of vegetation. Sparse vegetation cover, almost exclusively consisting of saltbush (*Atriplex parryii*), is found interspersed among the active dune areas. Denser plant communities composed of saltbush, greasewood (*Sarcobatus vermiculatus*), burrobush (*Ambrosia dumosa*), and cheesebush (*Hyumenoclea salsola*) are located upslope of the dunes complex to the east of SR 136.

The KCSD groundwater well that serves the community of Keeler was observed approximately one-quarter mile east of the subject property on the east side of SR 136, approximately one-half mile northeast of the community of Keeler (Survey Location 13). This well and its associated appurtenant structures, which appeared to be in operation, are enclosed with chain-link fencing. A wooden storage shed situated next to the well in the chain-link enclosure is used to store chlorine that is used for water treatment. No visual or olfactory indications of the leakage or spillage of chlorine were observed at this location

No indications of unauthorized releases of hazardous materials or unauthorized disposal sites were identified at, or adjacent to, the subject property.

4.2 ABOVEGROUND STORAGE TANKS AND UNDERGROUND STORAGE TANKS

No aboveground storage tanks (ASTs) or underground storage tanks (USTs) were identified at the subject property.

4.3 TRANSFORMERS AND POLYCHLORINATED BIPHENYLS EQUIPMENT

No transformers or other polychlorinated biphenyl equipment were observed at the subject property.

4.4 REGULATED HAZARDOUS MATERIALS

No evidence of regulated hazardous materials was observed at the site.

4.5 ASBESTOS-CONTAINING MATERIALS

Inspection for asbestos-containing materials (ACMs) was not included in the scope of this assessment. However, the plumbing associated with the existing KCSD well was visually inspected for the use of asbestos-containing transite pipe. The result of the inspection indicated that the piping associated with this well are metallic; therefore, testing for ACMs was not deemed necessary. No apparent indications of the use of suspect ACMs were identified at the site.

4.6 LEAD-BASED PAINTS

Inspection for lead-based paints (LBPs) was not included within the scope of this assessment. However, no apparent indications of suspect LBPs were identified at the site.

4.7 RADON GAS

Testing for radon gas was not included in the scope of this assessment.

4.8 AREA RECONNAISSANCE

The adjacent lands, in all directions, are undeveloped. No indications of the subject property being exposed to contamination from off-site sources were observed. It should be noted that SR 136 is adjacent to the turnout area considered in Alternative 4 and the KCSD well under consideration for Alternative 5.

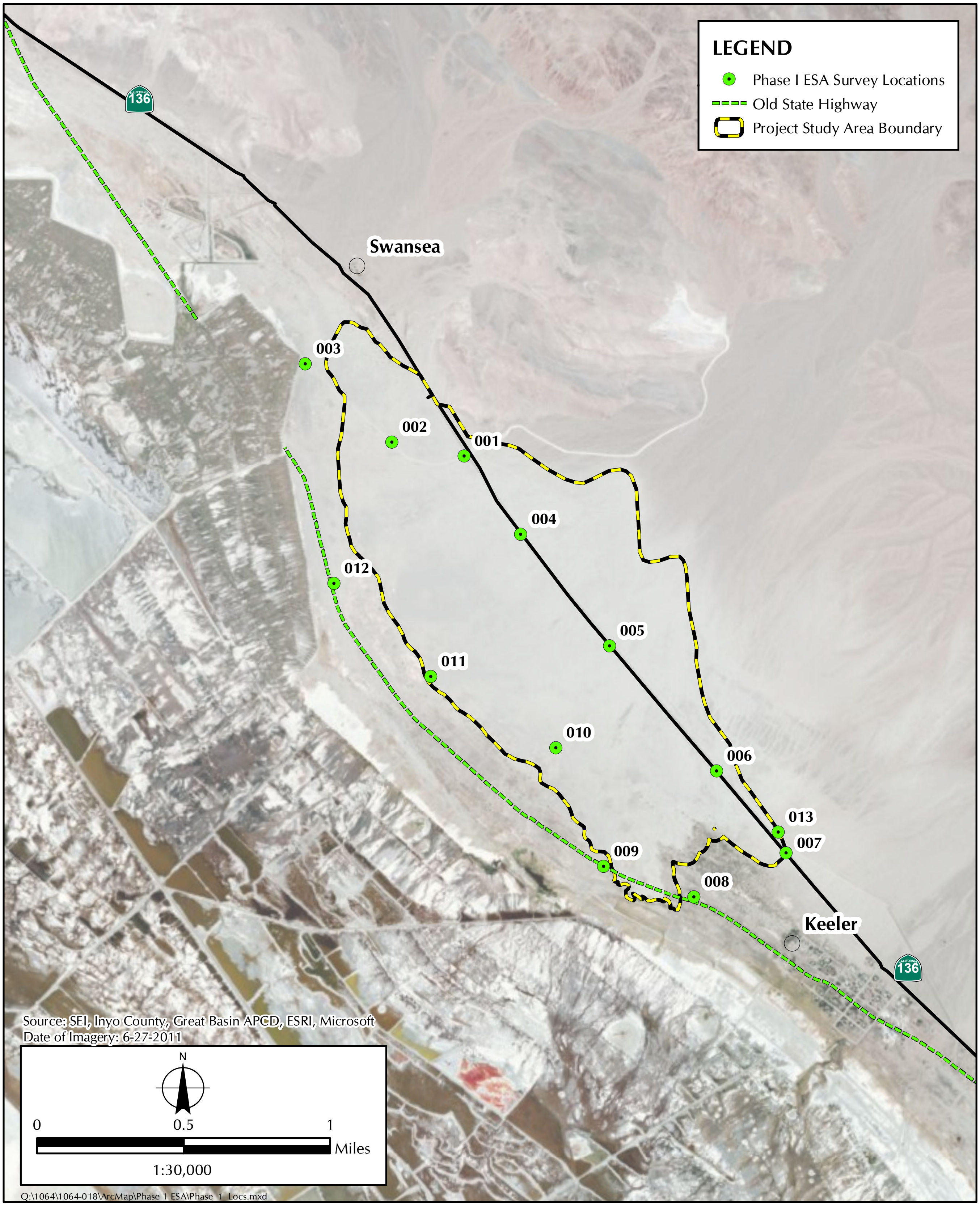

FIGURE 4.1-1

Phase I ESA Survey Locations

SECTION 5.0
SITE HISTORY

The following historical information was identified for the subject property and its adjacent properties.

5.1 HISTORICAL U.S. GEOLOGICAL SURVEY TOPOGRAPHIC MAPS

Historical U.S. Geological Survey (USGS) topographic maps of the subject property and adjacent properties were identified and reviewed for the years 1913, 1951, and 1987 (Appendix B, *Historical Topographic Maps*).[1] The review of these topographic maps indicates that the site has remained relatively unchanged. However, developments as they appeared during each time period are described below. The topographic relief of the project study area is 280 feet, with the elevation ranging from 3,605 feet above mean sea level (MSL) near the historic shore of Owens Lake to 3,885 feet above MSL on the upper portion of the alluvial fan.

1913

The Southern Pacific railroad line traverses the subject property in a northwest-southeast direction. A tramway traveled northeast from the southern portion of the site to the Cerro Gordo Mine in the nearby Inyo Mountain range. A facility indicated as "Soda Works" existed near the center of the subject property. No other developments were observed.

1951, 1987

The subject property was depicted as undeveloped land. The "Soda Works" facility, depicted on the 1913 historical topographic map, was not depicted on these maps. The communities of Swansea and Keeler are located approximately one half mile to the north and one-quarter mile to the southeast of the subject property, respectively.

5.2 HISTORICAL AERIAL PHOTOGRAPHS

Historical aerial photographs of the subject property were identified for the years 1947, 1964, 1982, 1994, 1998, 2005, 2010, and 2012 (Appendix C, *Historical Aerial Photographs*).[2] These photographs indicate that land uses at the subject property and adjacent parcels have remained unchanged throughout these time periods, consisting predominantly of undeveloped parcels covered by low-lying vegetation. A water diversion structure, which was built by Caltrans to divert runoff from the area upslope of the highway, is visible east of the paved roadway in the photographs taken from 1964 to 2012. No other changes in land use were identified at the subject property or its adjacent properties.

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[1] Environmental Data Resources, Inc. 25 July 2013. *The EDR Historical Topographic Map Report, Inquiry Number* 3661888.1. Contact: 440 Wheelers Farms Road, Milford, CT 06461.

[2] Environmental Data Resources, Inc. 20 July 2013. *The EDR Aerial Photo Decade Package, Inquiry Number* 3667562.1. Contact: 440 Wheelers Farms Road, Milford, CT 06461.

5.3 HISTORICAL SANBORN FIRE INSURANCE MAPS

Historical Sanborn fire insurance maps were not available for the subject property (Appendix D, *Sanborn Map Report*).[3]

5.4 USER QUESTIONNAIRE

A request for information the pertaining to the questions provided in Appendix X3, *User Questionnaire*, of ASTM Standard E 1527-05 was sent to the LADWP, the BLM, and the KSCD as owners/users of the subject property.

Responses to these questions are required in order for the user to qualify for one of the Landowner Liability Protections offered by the Small Business Liability Relief and Brownfields Revitalization Act of 2001. Failure to provide responses to these questions could result in a determination that "all appropriate inquiry" is not complete.

Neither the LADWP, the BLM, nor the KSCD provided responses to the questionnaire at the time of the preparation this report. However, the LADWP submitted a letter stating that the files regarding the Keeler Transfer Station were available for review at the LADWP Bishop, California office.[4] Based on the review of the LADWP records, the County of Inyo originally leased approximately 20 acres from LADWP in March 1959, known as the Keeler Landfill, to be used as a public garbage pit.[5] The former Keeler Landfill ceased operation prior to December 1987.[6] The former Keeler Landfill consisted of two distinct and separate disposal areas, identified as Site 1 and Site 2. Please see Figure 5.4-1, *Former Keeler Landfill and Existing Keeler Transfer Station Locations*. Site 1 consisted of approximately 0.7 acre located approximately 150 feet east of the southern boundary of the subject property. Site 2 consisted of approximately 1.1 acres, of which a portion is located within the southern boundary of the subject property.

The former Keeler Landfill historically served the community of Keeler and the surrounding area is believed to have begun operations in the late 1940s. Site 2 was the original landfill site and was operated till the mid-1970s. Site 1 began operation in the mid-1970s, replacing Site 2. Site 1 landfilling operations ceased in December 1987 and a small volume transfer station was located at Site 1.

The types of wastes received at the former landfill sites included wood waste, scrap metal, yard waste, and municipal waste. Historically, most of the waste received was burned. It appears a combination of area fill method and the trench fill method of waste disposal was used at Site 1. The size, depth, and location of the trenches are not known. The total volume of in-place waste is not known, but is estimated to be less than 10,000 cubic yards based on the waste footprint area and an assumed depth of 8 feet. It appears the area fill method of waste disposal was used at Site 2,

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[3] Environmental Data Resources, Inc. 10 July 2013. *Certified Sanborn Map Report, Inquiry Number* 3661888.3. Contact: 440 Wheelers Farms Road, Milford, CT 06461.

[4] Letter from James G. Yannotta, Manager of Aqueduct, Department of Water and Power of the City of Los Angeles to André A. Anderson, Senior Environmental Compliance Specialist, Sapphos Environmental, Inc. Dated 26 September 2013.

[5] Department of Water and Power of the City of Los Angeles. 2 February 1959. Rental Agreement No. 9725 with the County of Inyo. 2 February 1959.

[6] Minshew Engineering. March 2004. Final Closure and Post-closure Maintenance Plan, Keeler Landfill, Inyo County, California.

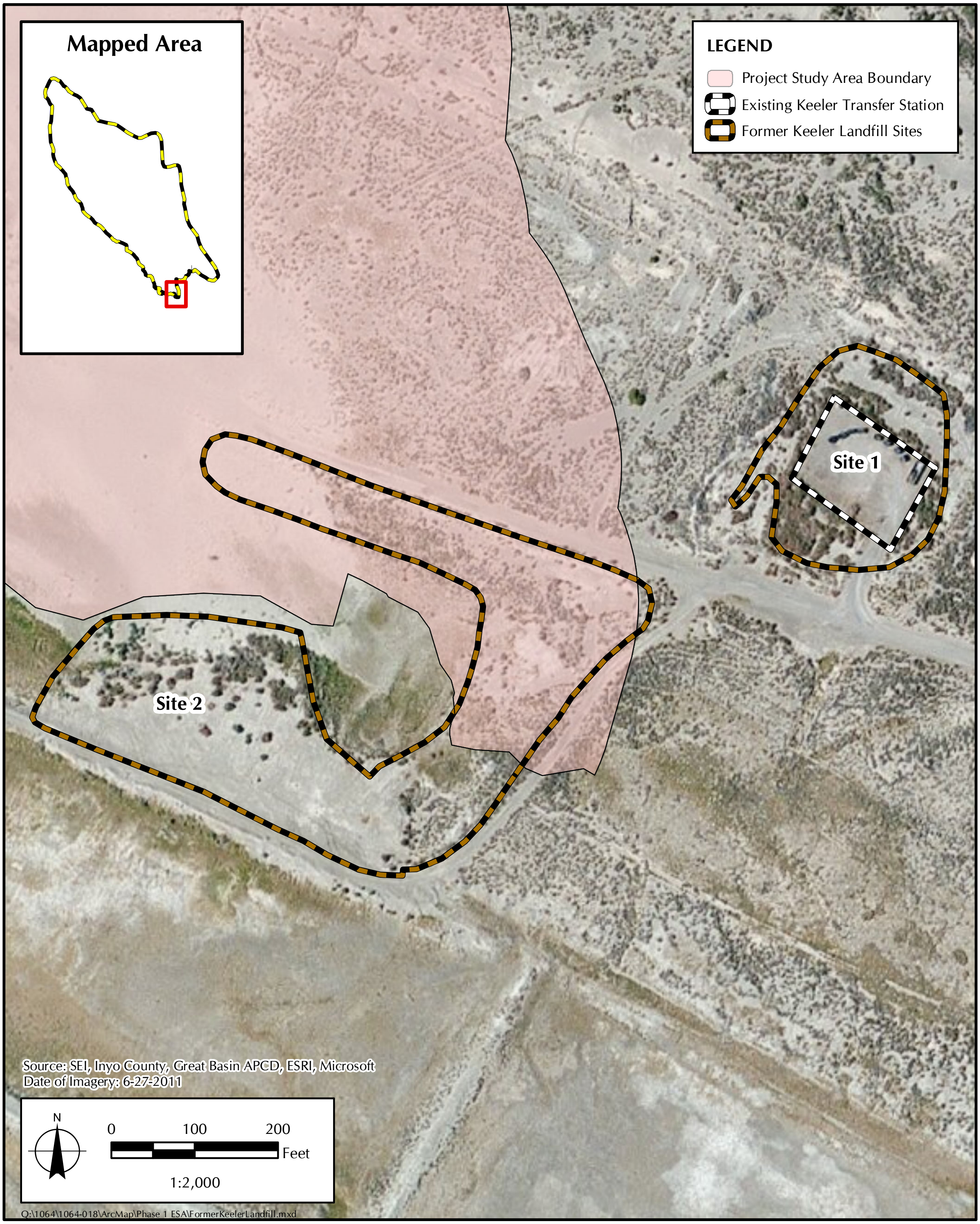

FIGURE 5.4-1

Former Keeler Landfill and Existing Keeler Transfer Station Locations with waste fill area being 1 to 3 feet higher than surrounding grade. The total volume of in-place waste is not known, but it is estimated to be less than 3,600 cubic based upon the waste footprint and an assumed depth of 2 feet.[7]

Landfilling activities are currently inactive. The former landfill has a small volume municipal waste transfer station in operation within Site 1 footprint the former Keeler Landfill. The waste is collected in bins and disposed at the Lone Pine Landfill. The facility receives less than one ton per day of waste.[8]

A Solid Waste Facilities Permit Application submitted by Inyo County in 1992 to the State of California Waste Management Board indicated that the a portion of Site 1 would be used as a transfer station for nonhazardous municipal waste.[9]

5.5 THE KEELER COMMUNITY SERVICES DISTRICT

Several unsuccessful attempts were made to contact the KCSD regarding information about the existing groundwater well that serves the community of Keeler. According to information obtained from the KCSD website, the KCSD was formed in 1980 and provides drinking water to 58 customers.[10] Information provided by the District, a permit to install the KCSD well was issued in 1983. The well was actually constructed in 1984.[11] No other information regarding the KCSD well was readily available.

[7] Minshew Engineering. March 2004. Final Closure and Post-closure Maintenance Plan, Keeler Landfill, Inyo County, California.

[8] Minshew Engineering. March 2004. Final Closure and Post-closure Maintenance Plan, Keeler Landfill, Inyo County, California.

[9] State of California Waste Management Board. 5 October 1992. Solid Waste Facilities Permit Application from Inyo County Environmental Health Department.

[10] Keeler Community Services District website. Available at: http://inyoplanning.org/lafco/documents/LAFCO-2012-KeelerCSD.pdf

[11] Telephone conversation between Andre A. Anderson, Senior Environmental Compliance Specialist, Sapphos Environmental, Inc. and Grace Holder, Project Manager, Great Basin Unified Air Pollution Control District. February 26, 2014.

SECTION 6.0
ENVIRONMENTAL SETTING

6.1 TOPOGRAPHY

The current environs of the Keeler Dunes area consist of sand sheets with several active sand dune areas. Recent research completed by the Desert Research Institute on behalf of the District indicates that while portions of these dunes may have been formed during periods of lake regression in the early Holocene, the greatest depositional period has been in the past 100 years since the desiccation of the lake following diversions by LADWP beginning in 1913.[1] The proposed project area is bisected by State Route 136, which runs along the eastern edge of Owens Lake. A water diversion structure, which was built by Caltrans to divert runoff from the area upslope of the highway, is located east of State Route 136. The topography of the subject property slopes gently to the south from the Tehachapi Mountains in the north. The project study area is bounded approximately by the Inyo Mountains on the east-northeast and the historic Owens Lake bed on the west-southwest, and extends approximately 2.5 miles to the northwest from the community of Keeler. Ephemeral drainages convey storm water from the foothills in the north across the subject property, in response to infrequent rain storms and snowmelt.

6.2 REGIONAL GEOLOGIC SETTING

Inyo County is characterized and contrasted by large mountain ranges and deep valleys formed by successive tectonic episodes of uplift and downward movements. The Owens Valley is a pull-apart, strike-slip basin formed by the uplift and subsidence of the surrounding mountains and valley floor.[2] These geologic forces are also responsible for the five major fault zones present in the region. Two large fault systems underlie the Owens Valley, while the surrounding mountains contain localized networks of faults, many of which have been active in the recent geologic past.[3] Movement along these faults can result in hazards such as liquefaction, ground shaking, landslides, and unstable soils. The Owens Valley forms the westernmost basin of the Great Basin physiographic province and collects a variety of sediments transported from the Sierra Nevada Mountains to the west and the Inyo Mountains to the east.[4]

During the Late Pleistocene, Owens Lake was an open-basin lake reaching high stands between approximately 3,756 feet (1,145 meters) and 3,805 feet (1,160 meters) above MSL and a closed-basin lake during the Holocene.[5] Closed-basin conditions have prevailed throughout most of the lake's history, which imply that there is no transport of material, either water or sediment, except through evaporation or wind transport.[6]

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[1] Great Basin Unified Air Pollution Control District. 2012. "Origin and Development of the Keeler Dunes." Available at http://gbuapcd.org/keelerdunes/originanddevelopment/.

[2] Johnson et al. June, 1999. *Characterization of the Owens Lake Basin Hydrology System Inyo County, California*. Prepared for: Great Basin Unified Air Pollution Control District. Bishop, CA. Available at: ftp://gbuapcd.org/HydroReports/Hydrology%20Summary%20Report.pdf

[3] Slemmons, D.B., Vittori, E., Jayko, A.S., Carver, G.A., Bacon, S.N. 2008. *Quaternary Fault and Lineament Map of Owens Valley, Inyo County, Eastern California*. Geological Society of America. Boulder, Colorado.

[4] Hunt, C.B. 1967. *Physiography of the United States*. San Francisco, CA: W.H. Freeman and Company.

[5] Bacon, S.N., R.M. Burke, S.K. Pezzopane, and A.S. Jayko. 2005. "Last Glacial Maximum and Holocene Lake Levels of Owens Lake, Eastern California, USA." *Quaternary Science Reviews*, 1–19.

[6] Soil and Water West, Inc. 25 September 2001. *Owens Lakebed Survey (Revised)*. Prepared by: Soil and Water West, Inc., P.O. Box 44666, Rio Rancho, NM. Prepared for: Great Basin Unified Air Pollution Control District, Bishop, CA.

Paleoenvironmental analyses indicate that Owens Lake has experienced a number of oscillations between approximately 27,000 calibrated years before present (cal yr BP) to the present resulting from climate changes.[7] Studies indicate the lake reached high stands between 24,000 and 23,730 cal yr BP; 15,700 and 15,000 cal yr BP; and 7,860 and 7,650 cal yr BP.[8,9] Dry periods were recorded between approximately 18,920 and 15,590 cal yr BP; at 11,200 cal yr BP; and between 6,500 and 4,400 cal yr BP.[10] Lake oscillations continued throughout the Late Holocene and, between 350 and 230 cal yr BP, records indicate that the lake dried into a playa.[11] The lake began its complete and final desiccation period after 1913, when the Owens River water was diverted to the Los Angeles Aqueduct by the City of LADWP.[12] By the mid-1920s, Owens Lake had become a dry playa, only to receive water on seven occasions due to unusually high runoff, in 1938, 1967, 1969, 1980, 1982, 1983, and 1986.[13]

The geomorphology of the subject property is characterized by aeolian, alluvial, lacustrine, playa, and anthropogenic features. The proposed project / proposed action study area consists mainly of active aeolian sand sheets and dunes and coppice and vegetated dunes overlying alluvial, lacustrine, and playa surfaces. Nearly all geomorphological features are formed of sand of varying size and texture. Many of the geomorphological features are quite recent, with aeolian and alluvial features formed as recent as the late 20th century.[14,15]

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[7] Bacon, S.N., R.M. Burke, S.K. Pezzopane, and A.S. Jayko. 2005. "Last Glacial Maximum and Holocene Lake Levels of Owens Lake, Eastern California, USA." *Quaternary Science Reviews*, 1–19.

[8] Bacon, S.N., R.M. Burke, S.K. Pezzopane, and A.S. Jayko. 2005. "Last Glacial Maximum and Holocene Lake Levels of Owens Lake, Eastern California, USA." *Quaternary Science Reviews*, 1–19.

[9] Orme, A.R, and A.J. Orme. 1993. "Late Pleistocene Oscillations of Lake Owens, Eastern California." *Geological Society of America Abstracts with Programs*, *25*: 129–130.

[10] Benson, L., Kashgarian, M., Rye, R., Lund, S., Paillet, F., and Smoot, J. 2002. "Holocene Multidecadal and Multicentennial Droughts Affecting Northern California and Nevada." *Quaternary Science Review*, *21*: 659–682.

[11] Li, H-C., Bischoff, J.L., Ku, T.L., Lund, S.P., and Stott, L.D. 2000. "Climate Variability in East Central California during the Past 1000 Years Reflected by High Resolution Geochemical and Isotopic Records from Owens Lake Sediments." *Quaternary Research*, *54*: 189–197.

[12] Smith, G.I., and Bischoff, J.L., Editors. 1993. "Core O.L. 92 from Owens Lake, Southeast California." U.S. Department of the Interior, U.S. Geological Survey, Open File Report 93-683. Menlo Park, CA.

[13] Stine, S. 1994. *Late Holocene Fluctuations of Owens Lake, Inyo County, California*. Prepared for: Far Western Anthropological Research Group, Inc., Davis, CA.

[14] Desert Research Institute. November 2012. Late Holocene Stratigraphy and Chronology of Keeler Dunes Area FinalReport. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20E%20-%20Stratigraphy%20Chronology%20and%20Sand%20Source%20Analysis/Lancaster%20and%20Bacon%202012a_Late%20Holocene%20stratigraphy%20and%20chronology_Final20121116.pdf

[15] Desert Research Institute. November 2012. Late Holocene Stratigraphy and Chronology of Keeler Dunes Area FinalReport. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20E%20-%20Stratigraphy%20Chronology%20and%20Sand%20Source%20Analysis/Lancaster%20and%20Bacon%202012a_Late%20Holocene%20stratigraphy%20and%20chronology_Final20121116.pdf

6.3 GEOLOGY AND SOILS

The predominant soils in the subject property are primarily coarse to loamy sands formed from local sandy alluvium (Figure 6.3-1, *Geomorphic Map of the Keeler Dunes Area*).[16,17] Soil composition varies with depth and can include gravels and clays.[18] The soils may have a thin salt crust on the surface unless it has been destroyed by wind erosion.[19] Coarse-textured soils are generally located near the inflow of the Owens River and finer-textured soils are located farther away on the lake bed.

Five geomorphic feature types have been mapped for the Keeler dune field area: aeolian, alluvial, lacustrine, playa, and anthropogenic.[20]

Aeolian features make up the majority (51.3 percent) of the Keeler dune field area and include active dune, active sand sheet, sand sheet with coppice dunes, and vegetated dune landform units.[21] The active sand dunes are generally low in height (2–3 meters; 6–10 feet) and are concentrated in the southwest portion of the proposed project / proposed action area.[22] Active sand sheets are generally flat planar features of sand less than 4 feet (1.2 meters) thick that move across and cover older playa surfaces and shoreline features.[23] Sand sheets with coppice dunes are areas of active sand that form low, vegetated sand mounds generally under 3 feet (1 meter) high. [24] Vegetated dunes may reach 10 feet (3 meter) in height, have significant vegetation coverage, and

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[16] U.S. Department of Agriculture, Natural Resources Conservation Service. Soil Survey Geographic Database (SSURGO ca675). Available at: http://soils.usda.gov/survey/geography/ssurgo/

[17] Great Basin Unified Air Pollution Control District. June 1997. *Soils of the Owens Lake Playa, Report I*. Keeler, CA.

[18] Great Basin Unified Air Pollution Control District. June 1997. *Soils of the Owens Lake Playa, Report I*. Keeler, CA.

[19] Great Basin Unified Air Pollution Control District. June 1997. *Soils of the Owens Lake Playa, Report I*. Keeler, CA.

[20] Desert Research Institute. November 2012. Geomorphic Mapping of the Keeler Dunefield and Surrounding Areas Final Report. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20D%20-%20Geomorphology/Bacon%20and%20Lancaster%202012_FINAL_REPORT_Geomorphic_Mapping_of_the_Keeler_Dunfield_and_Surrounding_Areas20121114.pdf

[21] Desert Research Institute. November 2012. Geomorphic Mapping of the Keeler Dunefield and Surrounding Areas Final Report. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20D%20-%20Geomorphology/Bacon%20and%20Lancaster%202012_FINAL_REPORT_Geomorphic_Mapping_of_the_Keeler_Dunfield_and_Surrounding_Areas20121114.pdf

[22] Desert Research Institute. November 2012. Late Holocene *S*tratigraphy and Chronology of Keeler Dunes *A*rea FinalReport. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20E%20-%20Stratigraphy%20Chronology%20and%20Sand%20Source%20Analysis/Lancaster%20and%20Bacon%202012a_Late%20Holocene%20stratigraphy%20and%20chronology_Final20121116.pdf

[23] Desert Research Institute. November 2012. Late Holocene *S*tratigraphy and Chronology of Keeler Dunes *A*rea FinalReport. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20E%20-%20Stratigraphy%20Chronology%20and%20Sand%20Source%20Analysis/Lancaster%20and%20Bacon%202012a_Late%20Holocene%20stratigraphy%20and%20chronology_Final20121116.pdf

[24] Desert Research Institute. November 2012. Late Holocene *S*tratigraphy and Chronology of Keeler Dunes *A*rea FinalReport. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20E%20-%20Stratigraphy%20Chronology%20and%20Sand%20Source%20Analysis/Lancaster%20and%20Bacon%202012a_Late%20Holocene%20stratigraphy%20and%20chronology_Final20121116.pdf

are found concentrated in the southeast portion of the proposed project / proposed action area. [25] The aeolian sands are typically medium-coarse grained and poorly to moderately sorted.

The alluvial features mapped in the Keeler dune field area include four alluvial fan units of varying age and a flood deposits unit. Generally, the alluvial fans in this area are coarse-grained and poorly sorted sedimentary deposits that are overlain by younger aeolian units throughout the Keeler dune field area.[26] Flood deposits are mostly silt and fine sand sediments deposited between 3,500 cal yr BP and recent time.[27]

The lacustrine features mapped in the Keeler dune field area include four lake plain units, two beach ridge units, and two terrace units of varying form and age. The lake plain units are former lake bottoms with surface cover ranging from a gravely desert pavement to tufa.[28] Beach ridges are sandy ridges parallel to former shorelines that formed through wave action.[29] The terrace units are the oldest units mapped in the Keeler dune field area and consist of well-developed ridges reaching heights of 6–10 feet (2–3 meters).[30] The lacustrine units are present mainly in the western portion of the Keeler dune field area.

Playa with silt crust is surface sediment on the exposed Owens Lake bed.[31] Two units associated with Owens playa sediment were recorded in the Keeler dune field area: disturbed playa surfaces

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[25] Desert Research Institute. November 2012. Late Holocene Stratigraphy and Chronology of Keeler Dunes Area FinalReport. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20E%20-%20Stratigraphy%20Chronology%20and%20Sand%20Source%20Analysis/Lancaster%20and%20Bacon%202012a_Late%20Holocene%20stratigraphy%20and%20chronology_Final20121116.pdf

[26] Desert Research Institute. November 2012. Geomorphic Mapping of the Keeler Dunefield and Surrounding Areas Final Report. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20D%20-%20Geomorphology/Bacon%20and%20Lancaster%202012_FINAL_REPORT_Geomorphic_Mapping_of_the_Keeler_Dunfield_and_Surrounding_Areas20121114.pdf

[27] Desert Research Institute. November 2012. Geomorphic Mapping of the Keeler Dunefield and Surrounding Areas Final Report. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20D%20-%20Geomorphology/Bacon%20and%20Lancaster%202012_FINAL_REPORT_Geomorphic_Mapping_of_the_Keeler_Dunfield_and_Surrounding_Areas20121114.pdf

[28] Desert Research Institute. November 2012. Geomorphic Mapping of the Keeler Dunefield and Surrounding Areas Final Report. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20D%20-%20Geomorphology/Bacon%20and%20Lancaster%202012_FINAL_REPORT_Geomorphic_Mapping_of_the_Keeler_Dunfield_and_Surrounding_Areas20121114.pdf

[29] Desert Research Institute. November 2012. Geomorphic Mapping of the Keeler Dunefield and Surrounding Areas Final Report. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20D%20-%20Geomorphology/Bacon%20and%20Lancaster%202012_FINAL_REPORT_Geomorphic_Mapping_of_the_Keeler_Dunfield_and_Surrounding_Areas20121114.pdf

[30] Desert Research Institute. November 2012. Geomorphic Mapping of the Keeler Dunefield and Surrounding Areas Final Report. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20D%20-%20Geomorphology/Bacon%20and%20Lancaster%202012_FINAL_REPORT_Geomorphic_Mapping_of_the_Keeler_Dunfield_and_Surrounding_Areas20121114.pdf

[31] Desert Research Institute. November 2012. Geomorphic Mapping of the Keeler Dunefield and Surrounding Areas Final Report. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20D%20-%20Geomorphology/Bacon%20and%20Lancaster%202012_FINAL_REPORT_Geomorphic_Mapping_of_the_Keeler_Dunfield_and_Surrounding_Areas20121114.pdf

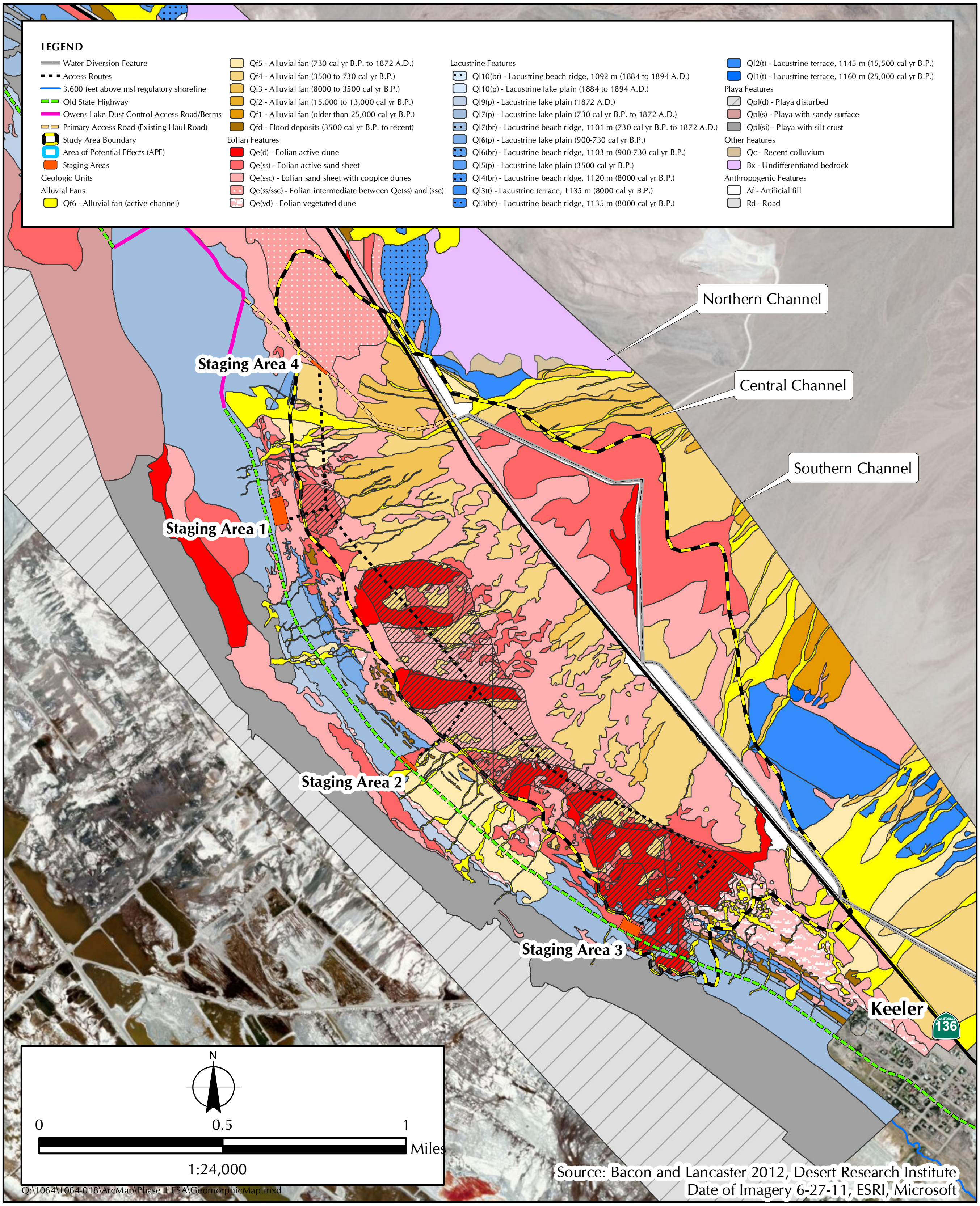

FIGURE 6.3-1

Geomorphic Map of the Keeler Dunes Area

and playa with silt crust. Both are present on the west edge of the Keeler dune field area. Disturbed playa surfaces have been impacted by human activity associated with dust abatement.[32]

Anthropogenic features are areas of significant human disturbance to the natural landscape, such as those that result from road construction.[33] These features are mainly present on the northeastern edge of the Keeler dune field area.

Based on analysis of historical photographs and satellite images, the historical development of the Keeler dune field has undergone significant changes since the mid-1940s, with a significant expansion of the dune area from the late 1950s to the 1990s. These changes include an increase in the area of the dune field and the development of well-defined linear and crescentic dunes[34]. There are two primary directions of sand movement: northwest/north-northwest and south/south-southeast. However, the overall net movement of sand is toward the southeast. The expansion of the dune field area involves sand from outside the dune field, including sand from the adjacent Owens River delta and NSS system.

The dune field overlies older sediment. The northern part of the dune field overlies early to late-Holocene (approximately 12,000 years ago to present) alluvial fan deposits, while the southern part of the dune field also overlies late Holocene deposits, alluvial fan deposits, as well as Holocene lacustrine (lake) deposits associated with ancient Owens Lake. Between the dune field and the exposed historic lakebed, the soil is predominately clays and silts associated with the Late Holocene to Owens Lake. In places within the dune field, there are scattered areas of thin (up to 20 centimeters) laminated silt deposits that overlie horizontally laminated or cross-bedded sand of aeolian origin.[35] Mineralogical analyses indicate that sand that comprises the dune field was derived from the Owens River system.[36] The mineral composition of the sand in the Keeler Dunes is dominated by quartz and feldspar.[37]

6.4 GROUNDWATER

The District has conducted an analysis of groundwater beneath the Keeler Dunes utilizing available data from the existing groundwater wells in the area and ground surface elevation data.[38] The groundwater elevation is approximately 3,614 feet above MSL at the subject property. Depth to

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[32] Desert Research Institute. November 2012. Geomorphic Mapping of the Keeler Dunefield and Surrounding Areas Final Report. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20D%20-%20Geomorphology/Bacon%20and%20Lancaster%202012_FINAL_REPORT_Geomorphic_Mapping_of_the_Keeler_Dunfield_and_Surrounding_Areas20121114.pdf

[33] Desert Research Institute. November 2012. Geomorphic Mapping of the Keeler Dunefield and Surrounding Areas Final Report. Available at: http://www.gbuapcd.org/keelerdunes/originanddevelopment/finalstaffreport/Attachment%20D%20-%20Geomorphology/Bacon%20and%20Lancaster%202012_FINAL_REPORT_Geomorphic_Mapping_of_the_Keeler_Dunfield_and_Surrounding_Areas20121114.pdf

[34] Desert Research Institute. 9 March 2012. Development of the Keeler Dunefield, Part 1 – "Analysis of Aerial Photographs and Satellite Images." Reno, NV.

[35] Desert Research Institute. 9 March 2012. Development of the Keeler Dunefield, Part 1 – "Analysis of Aerial Photographs and Satellite Images." Reno, NV.

[36] Desert Research Institute. 9 March 2012. Development of the Keeler Dunefield, Part 1 – "Analysis of Aerial Photographs and Satellite Images." Reno, NV.

[37] Desert Research Institute. 9 March 2012. Development of the Keeler Dunefield, Part 1 – "Analysis of Aerial Photographs and Satellite Images." Reno, NV.

[38] Inyo County Planning Committee. December 2011. *Draft Owens Lake Master Plan*. Review Draft. Independence, CA.

groundwater in the subject property ranges from approximately 196 feet on the eastern border, east of SR 136, to within a few feet of the surface along the southwestern study area border. The depth to groundwater in the dust control areas is estimated range from less than 70 feet to less than 10 feet. There are no surface water bodies within the subject property.

Regional confined artesian aquifers are present under the lake bed and display an overall upward movement of water. This discharge gradient is driven by the high evaporation demands of the system. Additionally, groundwater from the surrounding alluvial fans recharges the system and supplies many of the springs and seeps near the historic shoreline.[39]

6.5 HISTORIC SEISMICITY

The subject property is located within a seismically active region (Figure 6.5-1, *Geologic Faults*). Potential hazards that can result from seismic activities include surface rupture, ground shaking, liquefaction, and landslides. According to surveys of the region, numerous faults cut across near-surface and surface material and are considered active or potentially active. Of the four national earthquake zones, ranging from 1 to 4 with 4 posing the largest danger, the Owens Valley is classified as a Seismic Zone 4.[40]

Five major fault zones occur in the Owens Lake area, trending roughly north-south to northeast-southwest. The Sierra Nevada Frontal Fault System, the westernmost fault zone, exists along the east side of the Sierra Nevada Mountains and includes the Keough, Birch Creek, Shepard creek, Whitney Portal, Olancha, and Haiwee Sections.[41] This fault zone is not continuous along the entire length of the Sierra front, but is a complex system of faults and down-dropped blocks.

The second fault zone is the Owens Valley Fault Zone, in the middle of the Owens Valley north of the Alabama Hills, extending south along the west side of Owens Lake and terminating near the town of Olancha.[42] The Owens River Fault is a strike-slip fault zone that extends south-southwest from the Owens River delta through the center of Owens Lake bed.[43]

The eastern side of Owens Valley is bounded by the White Mountain and Inyo Mountain Fault Zones along the western margin of the White and Inyo Mountains.[44] Both the Sierra Nevada and Owens Valley Fault Zones are capable of generating earthquakes with a magnitude of 8.0 or greater, which would impact the subject property. Historic earthquakes in this region include the 1872 Owens Valley earthquake, with a magnitude of 7.2, and the earthquake swarms of May, 1980, which resulted in four magnitude 6.0 earthquakes in quick succession.[45,46]

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[39] Inyo County Planning Committee. December 2011. *Draft Owens Lake Master Plan*. Review Draft. Independence, CA.

[40] California Seismic Safety Commission. 2005. *Homeowner's Guide to Earthquake Safety*. Sacramento, CA. Available at: http://www.seismic.ca.gov/pub/CSSC_2005-01_HOG.pdf

[41] Slemmons, D.B., Vittori, E., Jayko, A.S., Carver, G.A., Bacon, S.N. 2008. *Quaternary Fault and Lineament Map of Owens Valley, Inyo County, Eastern California*. Geological Society of America. Boulder, Colorado.

[42] Slemmons, D.B., Vittori, E., Jayko, A.S., Carver, G.A., Bacon, S.N. 2008. *Quaternary Fault and Lineament Map of Owens Valley, Inyo County, Eastern California*. Geological Society of America. Boulder, Colorado.

[43] Johnson et al. June, 1999. *Characterization of the Owens Lake Basin Hydrology System Inyo County, California*. Prepared for: Great Basin Unified Air Pollution Control District. Bishop, CA. Available at: ftp://gbuapcd.org/HydroReports/Hydrology%20Summary%20Report.pdf

[44] Slemmons, D.B., Vittori, E., Jayko, A.S., Carver, G.A., Bacon, S.N. 2008. *Quaternary Fault and Lineament Map of Owens Valley, Inyo County, Eastern California*. Geological Society of America. Boulder, Colorado.

[45] Hill, D.P., Bailey, R.A., Sorey, M.L., Hendley, J.W., Stauffer, P.H. "Living With a Restless Caldera—Long Valley, California" U.S. *Geological Survey Fact Sheet 108-96*. Revised May 2000. Available at: http://pubs.usgs.gov/fs/fs108-96/

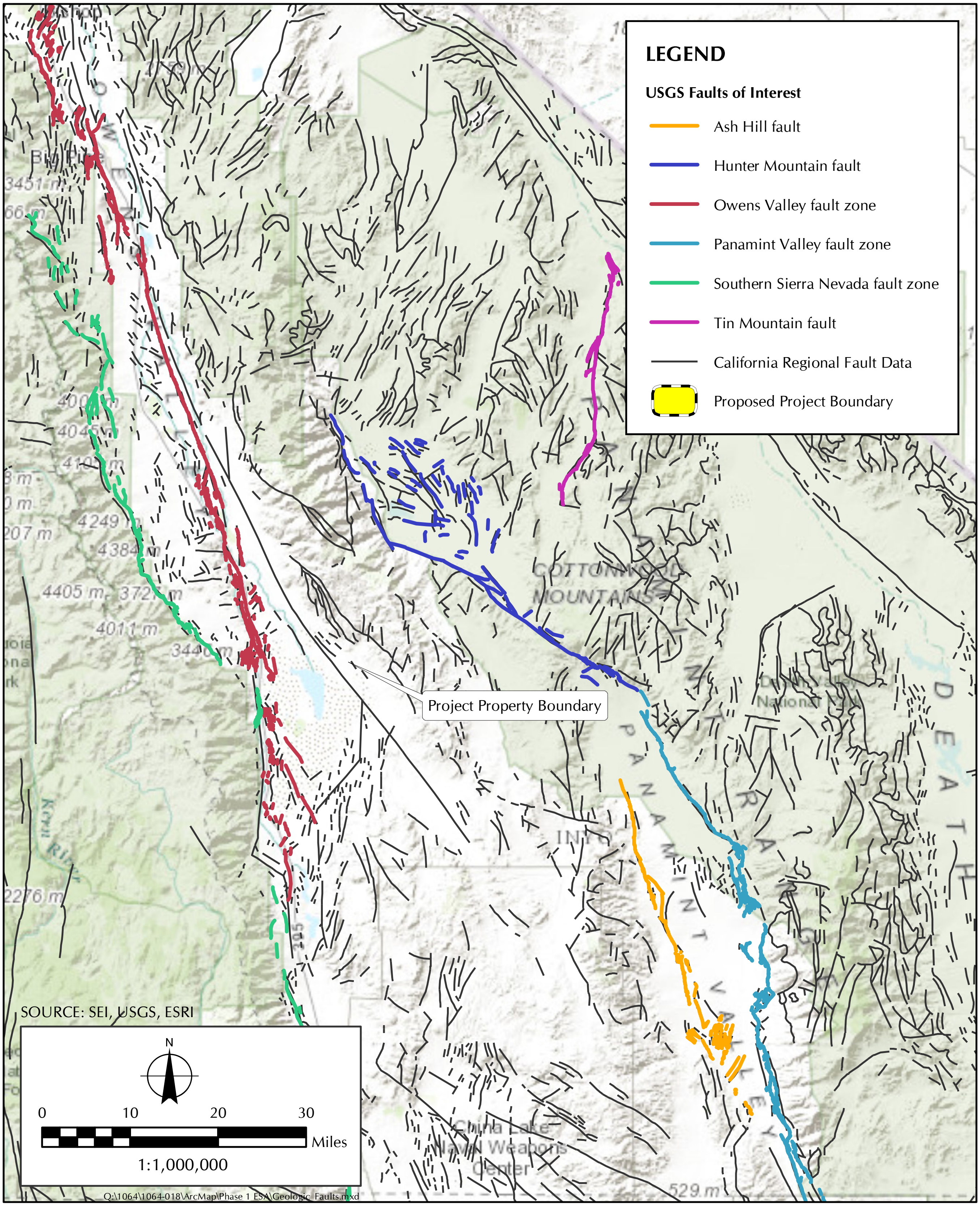

FIGURE 6.5-1
Geologic Faults

Although there are three APFEZs designated within 5 miles of the subject property, there are no APEFZ faults mapped within the proposed project / proposed action study area.[47,48,49] Further, the subject property is not delineated by the CGS under the Seismic Hazards Zonation Program (SHZP). This program assesses the effects of strong ground shaking, liquefaction, landslides, or other ground failure to provide a statewide program to assist cities and counties in fulfilling their responsibilities for protecting the public health and safety from the effects of strong seismic shaking and related ground failure.

[46] California Seismic Safety Commission. 2005. *Homeowner's Guide to Earthquake Safety*. Sacramento, CA. Available at: http://www.seismic.ca.gov/pub/CSSC_2005-01_HOG.pdf

[47] State of California Special Studies Map. 1 January 1990. *Bartlett Quadrangle*. Revised Official Map. Sacramento, CA.

[48] State of California Special Studies Map. 1 January 1990. *Lone Pine Quadrangle*. Revised Official Map. Sacramento, CA.

[49] State of California Special Studies Map. 1 January 1990. *Olancha Quadrangle*. Revised Official Map. Sacramento, CA.

SECTION 7.0
GOVERNMENT RECORDS REVIEW

7.1 FEDERAL, STATE, LOCAL, AND TRIBAL ENVIRONMENTAL REGULATORY DATABASES

The review of available federal, state, local, and tribal environmental regulatory databases indicated that the subject property is not identified on any environmental regulatory database (Appendix E, *Environmental Regulatory Databases*).[1]

However, according to the Solid Waste Facilities/Landfill Sites records (which typically contain an inventory of solid waste disposal facilities or landfills in a particular state), the Keeler Transfer Station is located approximately 150 feet southeast and downgradient of the subject property. The data comes from the Integrated Waste Management Board's Solid Waste Information System (SWIS) database. This facility serves as a collection point for nonhazardous municipal solid waste. Due to this facility's downgradient location and the fact that only nonhazardous municipal wastes is collected for eventual offsite disposal in a solid waste landfill, no impacts to the subject property are likely.

The review of the 28 "Orphan Sites" included in Appendix F indicated that there are no hazardous substances of hazardous waste sites that exist within a 1-mile radius of the subject property.

7.2 REGULATORY AGENCY RECORDS REVIEW

The District has initiated coordination with the KCSD regarding the history of the KCSD well and the potential use of the KCSD well in 2014. The District also attended a meeting with the KCSD on February 15, 2014. Currently, coordination has been undertaken by the District with Caltrans and KCSD regarding access and use of the KCSD well.

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[1] Environmental Data Resources, Inc. 11 July 2013. *DataMap Area Study*. Inquiry Number 3661888.1s. Contact: 440 Wheelers Farms Road, Milford, CT 06461.

SECTION 8.0
FINDINGS AND CONCLUSIONS

8.1 FINDINGS

A portion of the former Keeler Landfill, which was in operation from the 1940s to 1987, is located on the southern end of the subject property. However, this landfill was used to dispose non-hazardous municipal wastes. Historically, most of the waste received at the former landfill was burned. The former landfill has a small volume municipal waste transfer station in operation. The waste is collected in bins and disposed off-site at the Lone Pine Landfill. The facility receives less than one ton per day of waste.

The KCSD groundwater well, which serves the community of Keeler, was observed approximately one-quarter mile east of the subject property on the east side of SR 136, approximately one-half mile northeast of the city of Keeler. According to the KCSD website, the KCSD was formed in 1980 and serves 58 customers. The well was installed in 1984. No visual or olfactory indications of the leakage or spillage of chlorine stored at the well site were observed at this location.

No indications of the subject property or adjacent properties being exposed to hazardous materials or hazardous wastes were observed during the site inspection. Based on the (1) the site inspection; (2) the review of historical information dating back to 1913; and (3) the review of federal, state, local and tribal environmental regulatory databases, no indications of the use, generation, storage, transport, or disposal of hazardous materials at the site or adjacent properties were identified.

8.2 CONCLUSIONS

This Phase I ESA has been conducted in conformance with the scope and limitations of the American Society for Testing and Materials (ASTM) Practice E 1527-05. Any exceptions to, or deletions from, this practice are described in Section 2.4 of this report.

Other than the former non-hazardous municipal waste landfill, this assessment has revealed no evidence of RECs in connection with the subject property. No further action is recommended at this time.

SECTION 9.0
REFERENCES

American Society for Testing and Materials. 1 November 2005. Standard 1527-05, *"Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process."*

Bechtel Power Corporation. 23 April 2012. *Catalina Renewable Energy Project Construction Hazardous Materials Business Plan*. Frederick, MD.

California Department of Conservation, Division of Oil, Gas and Geothermal Resources. DOGGR On-line Mapping System. Available at: http://maps.conservation.ca.gov/doms/doms-app.html

California Department of Water Resources. 2006. Groundwater Contour Maps. Available at: http://www.water.ca.gov/groundwater/data_and_monitoring/south_central_region/GroundwaterLevel/gw_level_monitoring.cfm

California Department of Water Resources. Water Data Library. Available at: http://www.water.ca.gov/waterdatalibrary/

Department of Water and Power of the City of Los Angeles. 2 February 1959. Rental Agreement No. 9725 with the County of Inyo. 2 February 1959.

Dibblee, T. W., Jr.1963. Geology of the Willow Springs and Rosamond Quadrangles, California. U.S. Geological Survey Bulletin 1089-C, scale 1:62500.

Environmental Data Resources, Inc. 12 October 2012. *The EDR Historical Topographic Map Report, Inquiry Number* 3429412.1. Contact: 440 Wheelers Farms Road, Milford, CT 06461.

Environmental Data Resources, Inc. 2 May 2012. *The EDR Aerial Photo Decade Package, Inquiry Number* 3312147.1. Contact: 440 Wheelers Farms Road, Milford, CT 06461.

Environmental Data Resources, Inc. 8 October 2012. *Certified Sanborn Map Report, Inquiry Number* 3627605.3. Contact: 440 Wheelers Farms Road, Milford, CT 06461.

Environmental Data Resources, Inc. 10 July 2013. *DataMap Area Study*. Inquiry Number 3659638.1s. Contact: 440 Wheelers Farms Road, Milford, CT 06461.

Great Basin Unified Air Pollution Control District. 2012. "Origin and Development of the Keeler Dunes." Available at http://gbuapcd.org/keelerdunes/originanddevelopment/

Keeler Community Services District website. Available at: http://inyoplanning.org/lafco/documents/LAFCO-2012-KeelerCSD.pdf

Kern County. 15 June 2004 (Amended 13 March 2007). *Kern County General Plan*. Bakersfield, CA. Available at: http://www.co.kern.ca.us/planning/pdfs/kcgp/KCGP.pdf

Kern County. Amended 1 April 2008. *Willow Springs Specific Plan*. Resolution No. 2008-082. Kern County, CA. Available at: http://www.co.kern.ca.us/planning/pdfs/SPs/WillowSprings_SP.pdf

Kern County. March 2009. Zoning Ordinance, Title 19, Section 19.64.140. Available at: http://www.co.kern.ca.us/planning/pdfs/KCZOMar09.pdf

Kern County. 6 December 2011. *Catalina Renewable Energy Project Environmental Impact Report, Appendix F, Limited Feasibility Level Geological Hazards and Soils Evaluation*. Prepared by: County of Kern Planning and Community Development Department, Bakersfield, CA, with technical assistance by Kleinfelder West, Inc., Fresno, CA.

Kern County. 6 December 2011. *Catalina Renewable Energy Project Environmental Impact Report, Appendix K, Water Supply Assessment, Proposed Catalina Renewable Energy Project, Kern County, California*. Prepared by: County of Kern Planning and Community Development Department, Bakersfield, CA, with technical assistance by Kleinfelder West, Inc. Fresno, CA.

Letter from James G. Yannotta, Manager of Aqueduct, Department of Water and Power of the City of Los Angeles to André A. Anderson, Senior Environmental Compliance Specialist, Sapphos Environmental, Inc. Dated 26 September 2013.

Minshew Engineering. March 2004. Final Closure and Post-closure Maintenance Plan, Keeler Landfill, Inyo County, California.

U.S. Department of Agriculture, Natural Resources Conservation Service. Soil Survey Geographic Database (SSURGO ca675). Available at: http://soils.usda.gov/survey/geography/ssurgo/

U.S. Environmental Protection Agency. 1 November 2005. "Standards and Practices for all Appropriate Inquiries; Final Rule." *Federal Register*, Part III, 40 CFR, Part 312.

U.S. Geological Survey. 1965. Photo Revised 1974. 7.5-Minute Series, Willow Springs, California, Topographic Quadrangle. Reston, VA.

U.S. Geological Survey. Photo Inspected 1995. 7.5-Minute Series, Tylerhorse Canyon, California, Topographic Quadrangle. Scale 1:24,000. Reston, VA.

U.S. Geological Survey. Photo Inspected 1995. 7.5-Minute Series, Fairmont Butte, California, Topographic Quadrangle. Scale 1:24,000. Reston, VA.

SECTION 10.0
REPORT AUTHORSHIP

This Phase I Environmental Site Assessment report was prepared by:

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Pasadena, California 91107

This report was reviewed by:

Ms. Marie Campbell, President
Manager of Environmental Compliance
Sapphos Environmental, Inc.
430 North Halstead Street
Pasadena, California 91107

We declare that, to the best of our professional knowledge and belief, we meet the definition of environmental professionals as defined in §312.10 of 40 CFR Part 312 and we have the specific qualifications based on education, training, and experience to assess the nature, history, and setting of the subject property. We have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Mr. André A. Anderson, REPA, CEC, CES
Senior Environmental Compliance Specialist

APPENDIX A
SITE PHOTOGRAPHS

PHOTO 1
Location 1. Subject property looking north

PHOTO 2
Location 1. Subject property looking east

PHOTO 3
Location 1. Subject property looking south

PHOTO 4
Location 1. Subject property looking west

PHOTO 5
Location 2. Subject property looking north

PHOTO 6
Location 2. Subject property looking east along access road from State Route136

PHOTO 7
Location 2. Subject property looking south

PHOTO 8
Location 2. Subject property looking west

PHOTO 9
Location 3. Subject property looking north

PHOTO 10
Location 3. Subject property looking east

PHOTO 11
Location 3. Subject property looking south

PHOTO 12
Location 3. Subject property looking west

PHOTO 13
Location 4. Subject property looking north

PHOTO 14
Location 4. Subject property looking east

PHOTO 15
Location 4. Subject property looking south

PHOTO 16
Location 4. Subject property looking west

PHOTO 17
Location 5. Subject property looking north

PHOTO 18
Location 5. Subject property looking east

PHOTO 19
Location 5. Subject property looking south

PHOTO 20
Location 5. Subject property looking west

PHOTO 21
Location 6. Subject property looking north

PHOTO 22
Location 6. Subject property looking east

PHOTO 23
Location 6. Subject property looking south

PHOTO 24
Location 6. Subject property looking west

PHOTO 25
Location 7. Subject property looking east

PHOTO 26
Location 7. Subject property looking north

PHOTO 27
Location 7. Subject property looking south toward community of Keeler

PHOTO 28
Location 7. Subject property looking west

PHOTO 29
Location 8. Sign at entrance to Inyo County Waste Management Keeler Transfer Station

PHOTO 30
Location 8. Inyo County Waste Management Keeler Transfer Station

PHOTO 31
Location 9. Subject property looking north

PHOTO 32
Location 10. Subject property looking north

PHOTO 33
Location 10. Subject property looking east

PHOTO 34
Location 10. Subject property looking south

PHOTO 35
Location 10. Subject property looking west

PHOTO 36
Location 11. Subject property looking north

PHOTO 37
Location 11. Subject property looking east

PHOTO 38
Location 11. Looking south

PHOTO 39
Location 11. Subject property looking west

PHOTO 40
Location 12. Subject property looking north

PHOTO 41
Location 12. Subject property looking east.

PHOTO 42
Location 12. Looking south

PHOTO 43
Location 12. Subject property looking west

APPENDIX B
HISTORICAL TOPOGRAPHIC MAPS

Keeler Dunes Dust Control Project
Keeler Dunes Dust Control Project
Keeer, CA 93545

Inquiry Number: 3661888.2
July 25, 2013

EDR Historical Topographic Map Report

EDR® Environmental Data Resources Inc

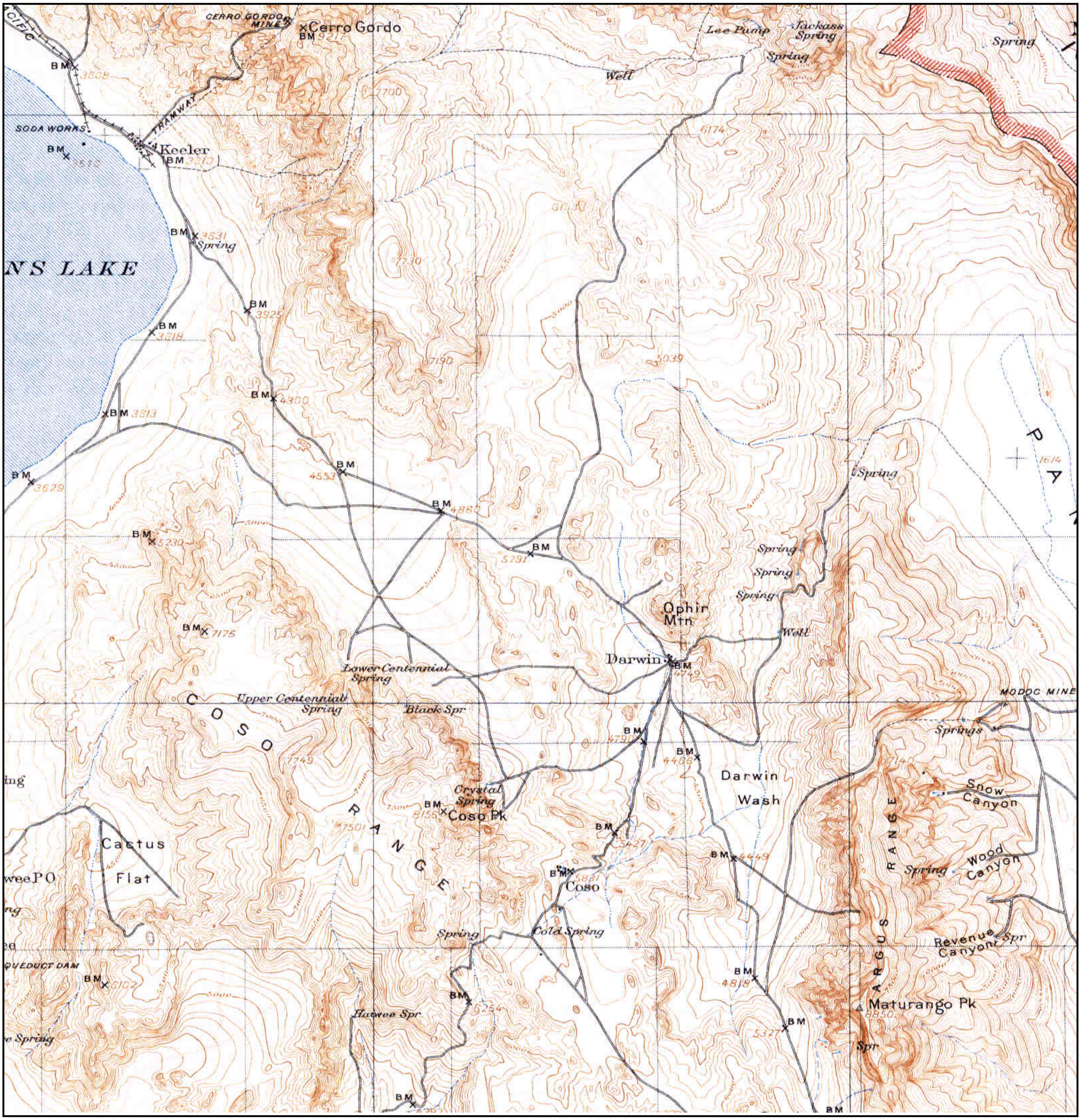
440 Wheelers Farms Road
Milford, CT 06461
800.352.0050
www.edrnet.com

EDR Historical Topographic Map Report

Environmental Data Resources, Inc.s (EDR) Historical Topographic Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topographic Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the early 1900s.

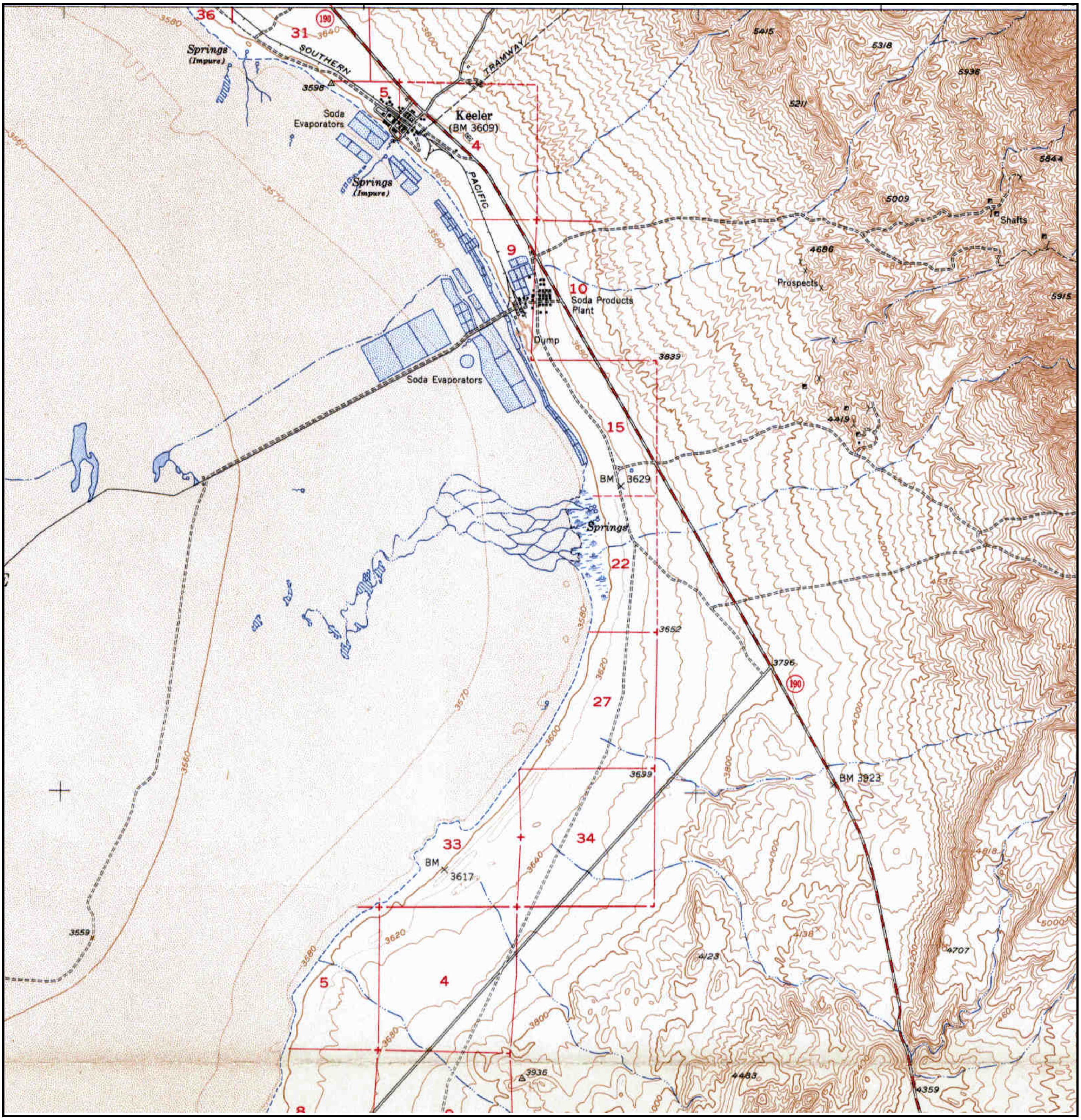
Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

Historical Topographic Map



N	TARGET QUAD NAME: BALLARAT MAP YEAR: 1913 SERIES: 60 SCALE: 1:250000	SITE NAME: Keeler Dunes Dust Control Project ADDRESS: Keeler Dunes Dust Control Project Keeer, CA 93545 LAT/LONG: 36.507 / -117.8933	CLIENT: Sapphos Environmental, Inc. CONTACT: Andre Anderson INQUIRY#: 3661888.2 RESEARCH DATE: 07/25/2013

Historical Topographic Map



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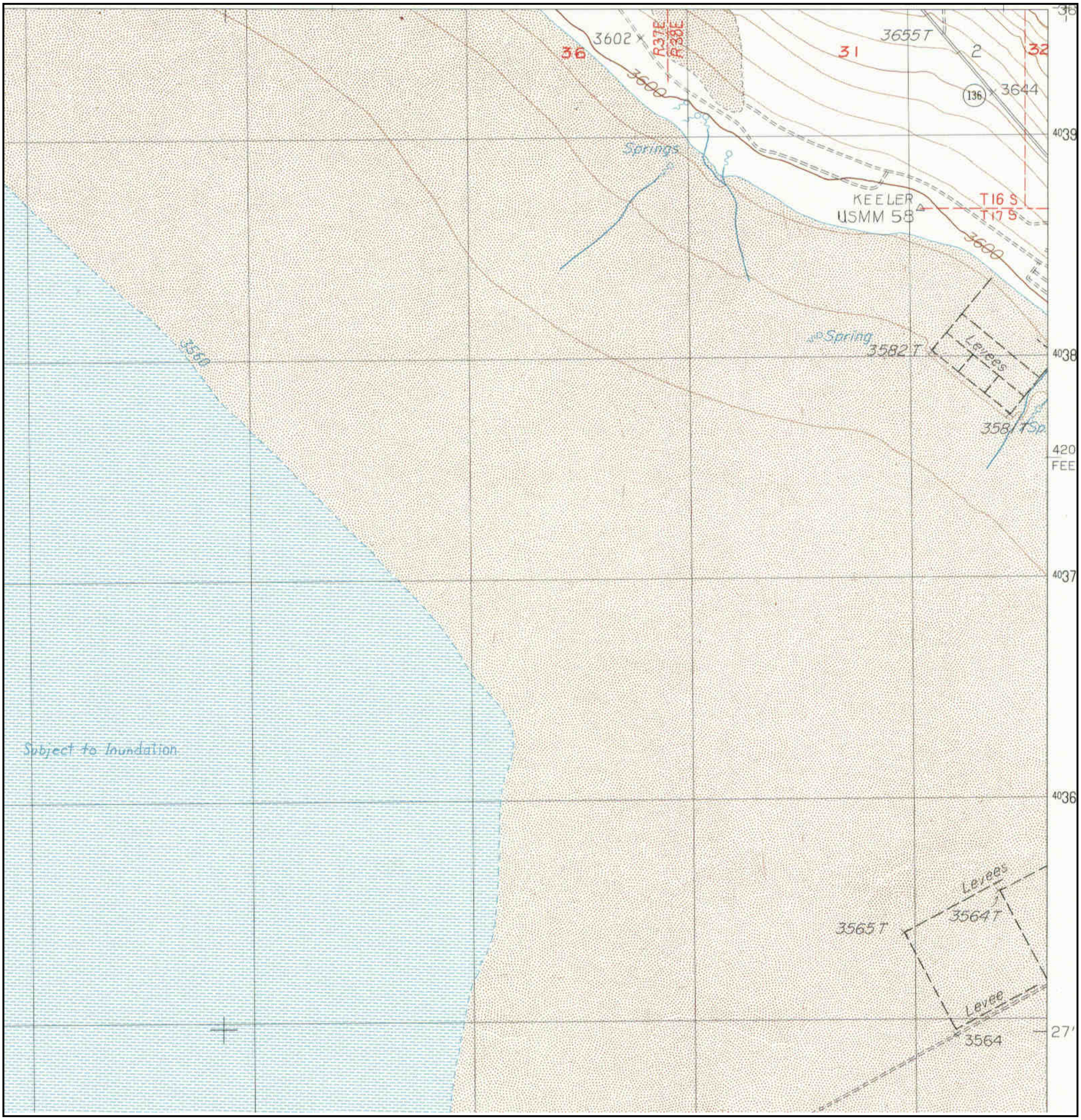
TARGET QUAD NAME: KEELER MAP YEAR: 1951 SERIES: 15 SCALE: 1:62500	SITE NAME: Keeler Dunes Dust Control Project ADDRESS: Keeler Dunes Dust Control Project Keeer, CA 93545 LAT/LONG: 36.507 / -117.8933	CLIENT: Sapphos Environmental, Inc. CONTACT: Andre Anderson INQUIRY#: 3661888.2 RESEARCH DATE: 07/25/2013

Historical Topographic Map

N	TARGET QUAD NAME: NEW YORK BUTTE MAP YEAR: 1951 SERIES: 15 SCALE: 1:62500	SITE NAME: Keeler Dunes Dust Control Project ADDRESS: Keeler Dunes Dust Control Project Keeer, CA 93545 LAT/LONG: 36.507 / -117.8933	CLIENT: Sapphos Environmental, Inc. CONTACT: Andre Anderson INQUIRY#: 3661888.2 RESEARCH DATE: 07/25/2013

Historical Topographic Map



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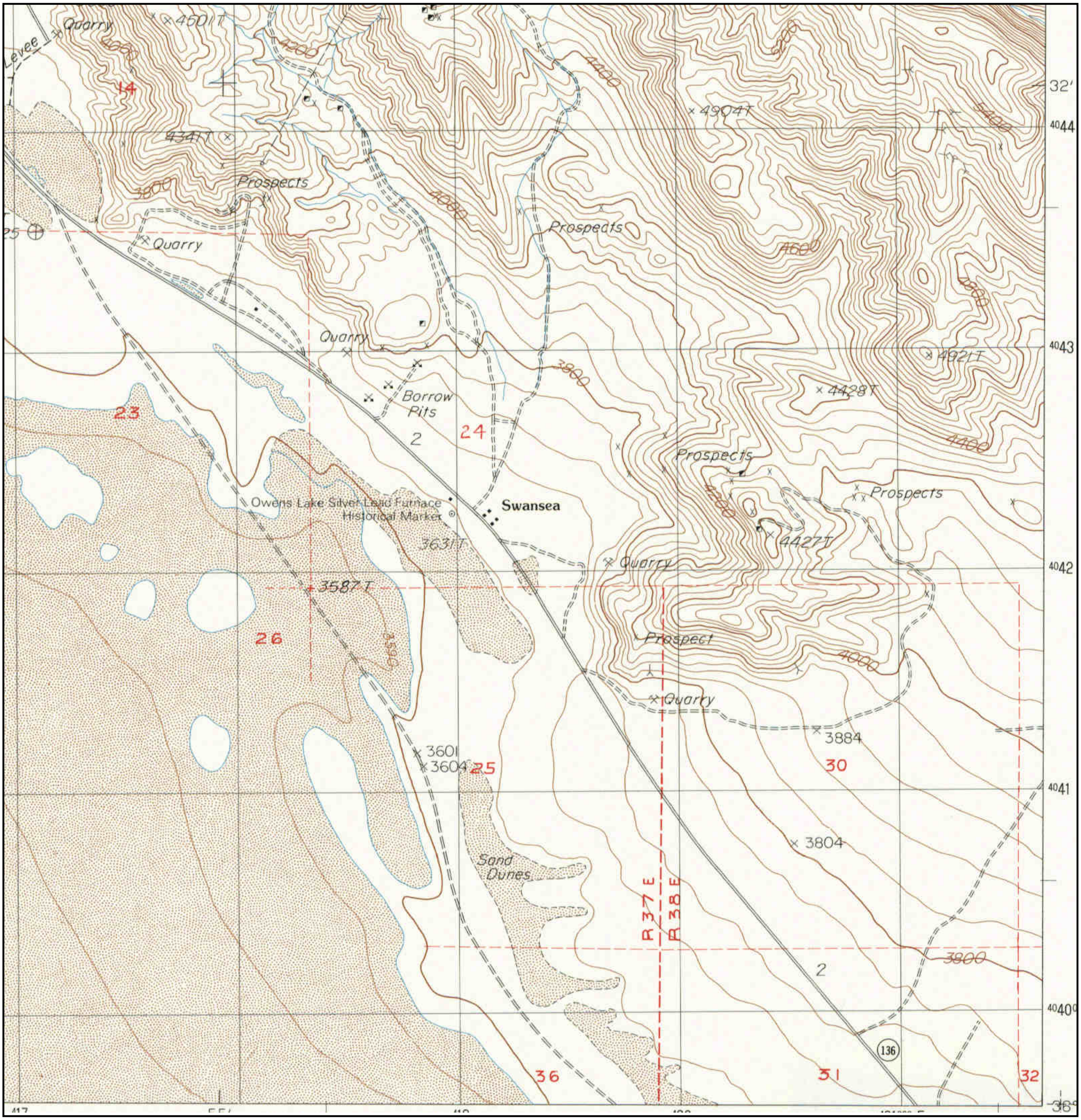
Historical Topographic Map

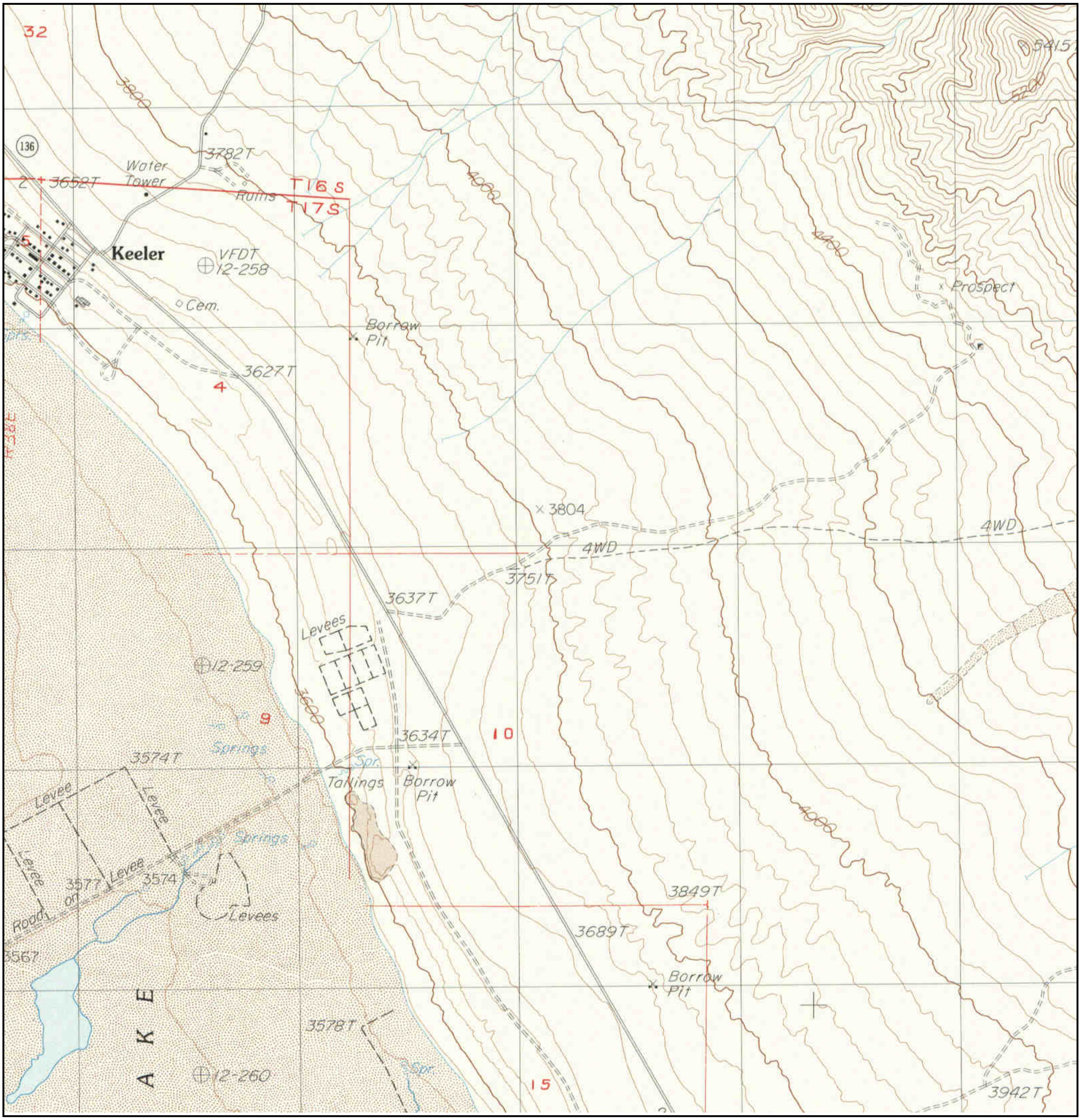
N	TARGET QUAD NAME: DOLOMITE MAP YEAR: 1987 SERIES: 7.5 SCALE: 1:24000	SITE NAME: ADDRESS: LAT/LONG:	Keeler Dunes Dust Control Project Keeler Dunes Dust Control Project Keeer, CA 93545 36.507 / -117.8933	CLIENT: CONTACT: INQUIRY#: RESEARCH DATE: 07/25/2013	Sapphos Environmental, Inc. Andre Anderson 3661888.2

Historical Topographic Map



N TARGET QUAD NAME: DOLOMITE MAP YEAR: 1987 SERIES: 7.5 SCALE: 1:24000	SITE NAME: Keeler Dunes Dust Control Project ADDRESS: Keeler Dunes Dust Control Project Keeer, CA 93545 LAT/LONG: 36.507 / -117.8933	CLIENT: Sapphos Environmental, Inc. CONTACT: Andre Anderson INQUIRY#: 3661888.2 RESEARCH DATE: 07/25/2013

Historical Topographic Map



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APPENDIX C
HISTORICAL AERIAL PHOTOGRAPHS

Keeler Dunes Dust Control Project
Keeler Dunes Dust Control Project
Lone Pine, CA 93545

Inquiry Number: 3667562.1
July 20, 2013

The EDR Aerial Photo Decade Package

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Please contact EDR at 1-800-352-0050
with any questions or comments.

Date EDR Searched Historical Sources:

Aerial Photography July 20, 2013

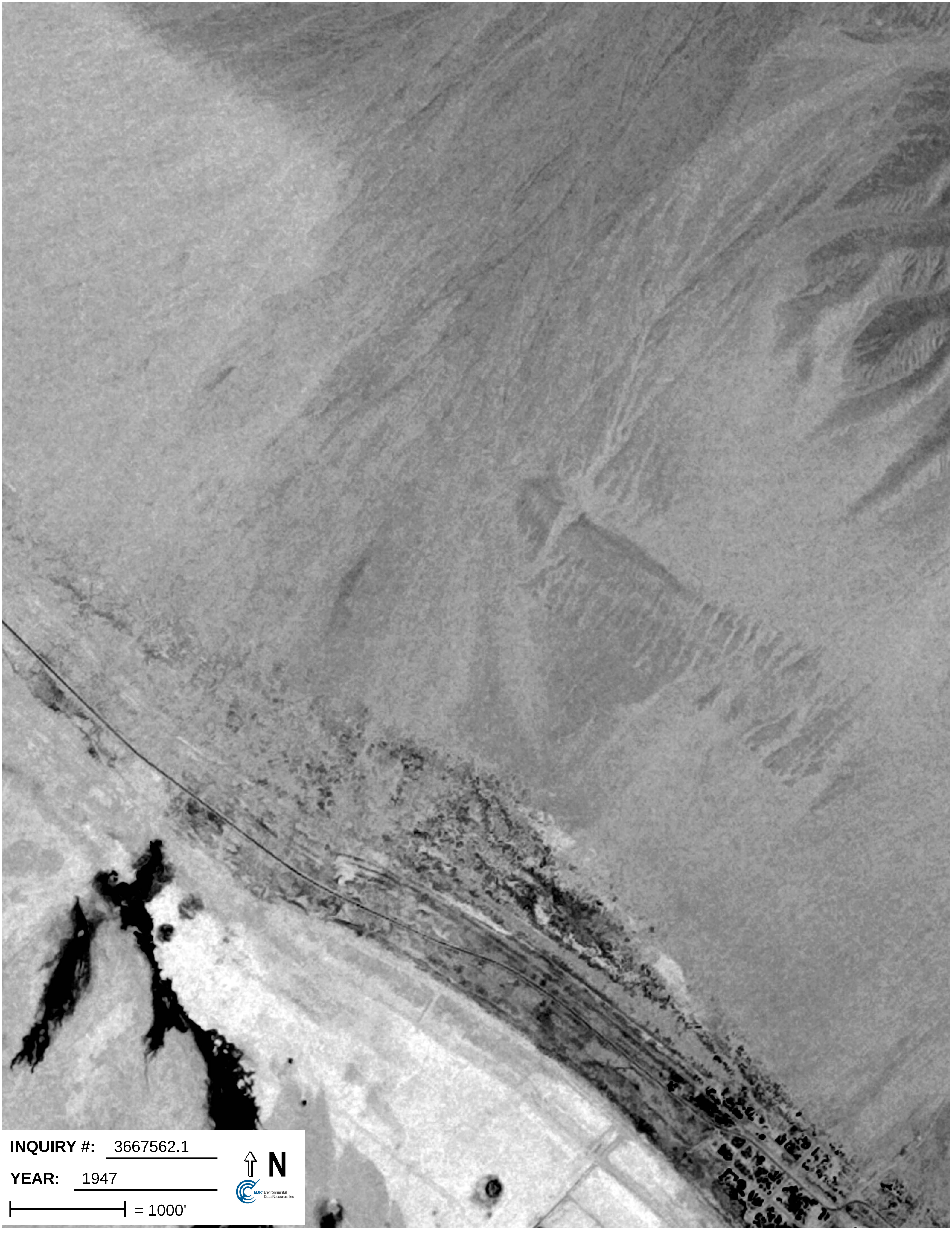
Target Property:

Keeler Dunes Dust Control Project

Lone Pine, CA 93545

Year	***Scale***	***Details***	***Source***
1947	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1947	USGS
1947	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1947	USGS
1964	Aerial Photograph. Scale: 1"=800'	Flight Year: 1964	Fairchild
1964	Aerial Photograph. Scale: 1"=800'	Flight Year: 1964	Fairchild
1982	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1982	USGS
1982	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1982	USGS
1994,1993	Aerial Photograph. Scale: 1"=500'	/Composite DOQQ - acquisition dates: 1994,1993	EDR
1994	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1994	USGS
1994	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1994	USGS
1998	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1998	USGS
1998	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1998	USGS
2005	Aerial Photograph. Scale: 1"=500'	Flight Year: 2005	EDR
2009	Aerial Photograph. Scale: 1"=500'	Flight Year: 2009	EDR
2010	Aerial Photograph. Scale: 1"=500'	Flight Year: 2010	EDR
2012	Aerial Photograph. Scale: 1"=500'	Flight Year: 2012	EDR


INQUIRY #: 3667562.1
YEAR: 1947
= 1000'
N
EDR Environmental Data Resources Inc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YEAR: 1947
= 1000'
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EDR Environmental Data Resources Inc


INQUIRY #: 3667562.1
YEAR: 1964
= 800'
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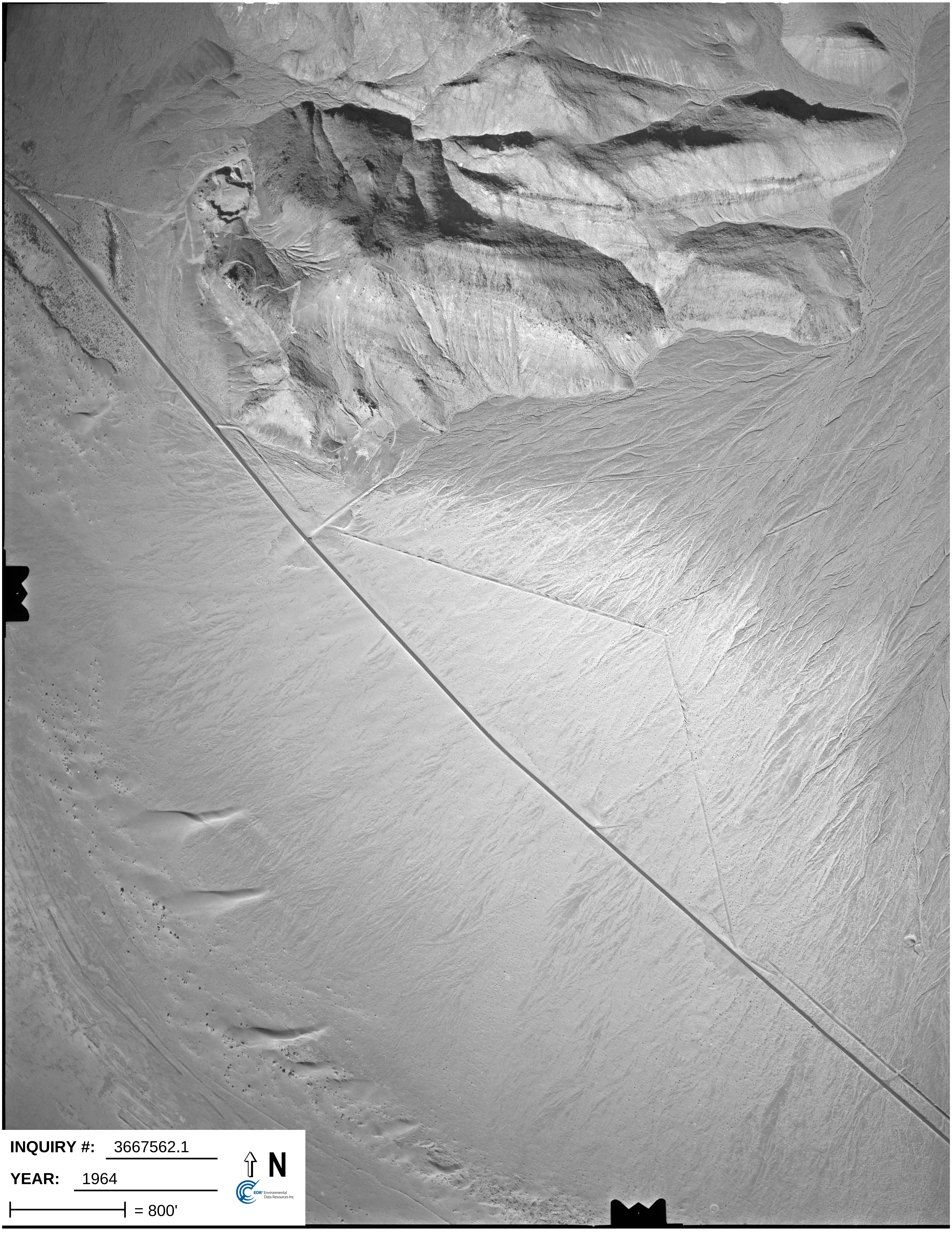
EDR Environmental Data Resources Inc



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YEAR: 1964

= 800'

N

EDR Environmental Data Resources Inc


INQUIRY #: 3667562.1
YEAR: 1982
= 1000'
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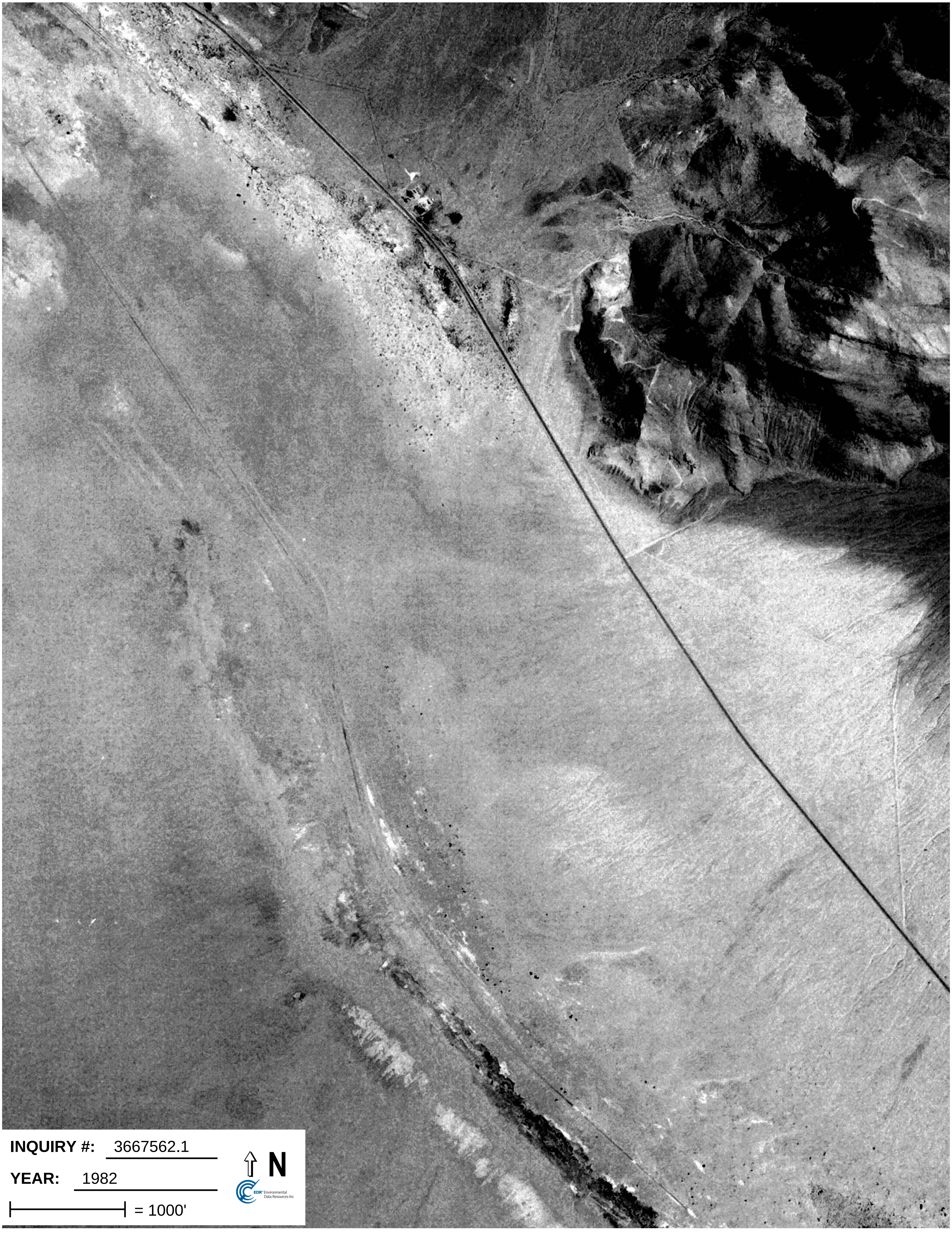
EDR Environmental Data Resources Inc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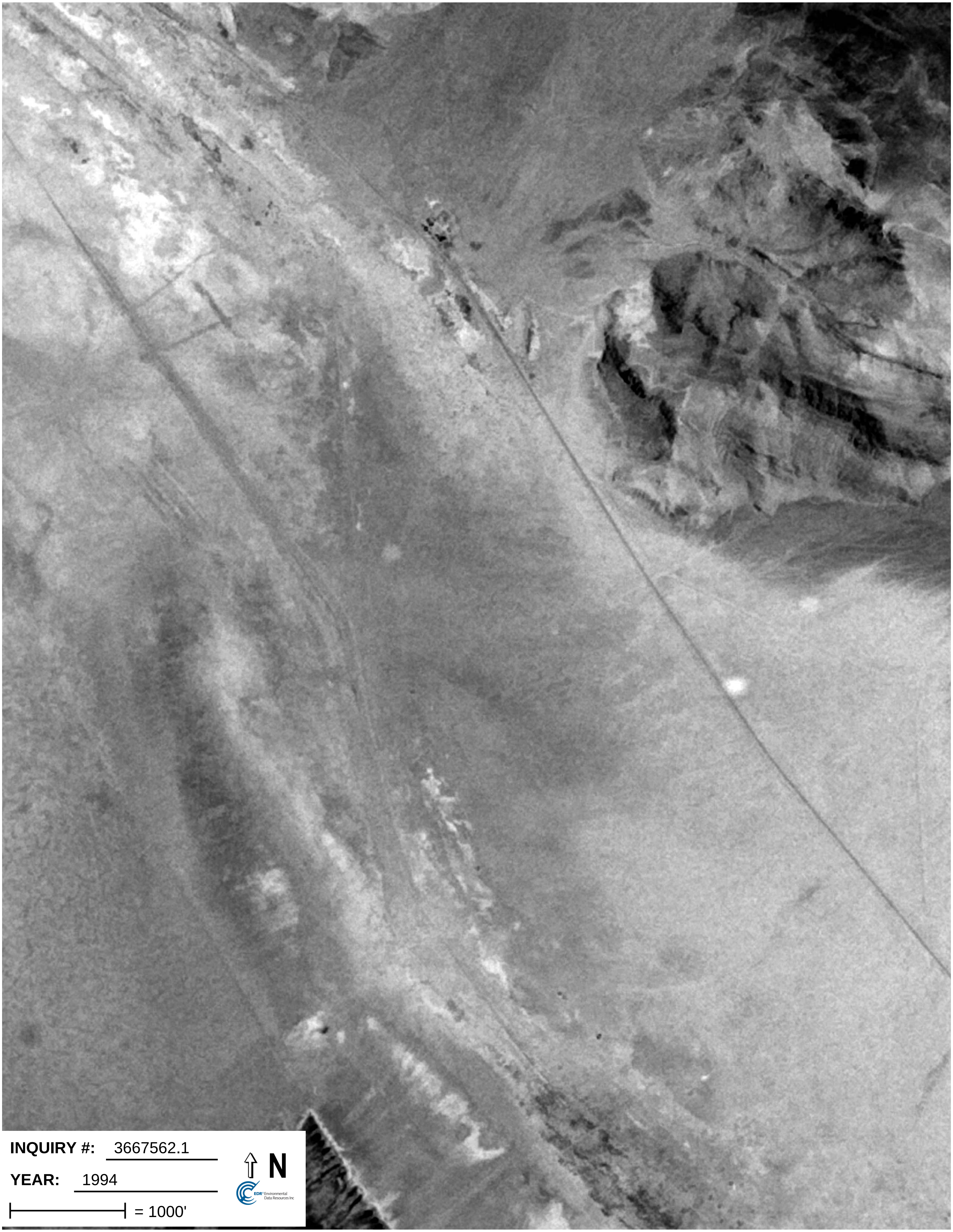
YEAR: 1982
= 1000'
N
EDR Environmental Data Resources Inc


INQUIRY #: 3667562.1
YEAR: 1994,1993 (DOQQ)
= 500'
N


INQUIRY #: 3667562.1
YEAR: 1994
N
= 1000'
EDR Environmental Data Resources Inc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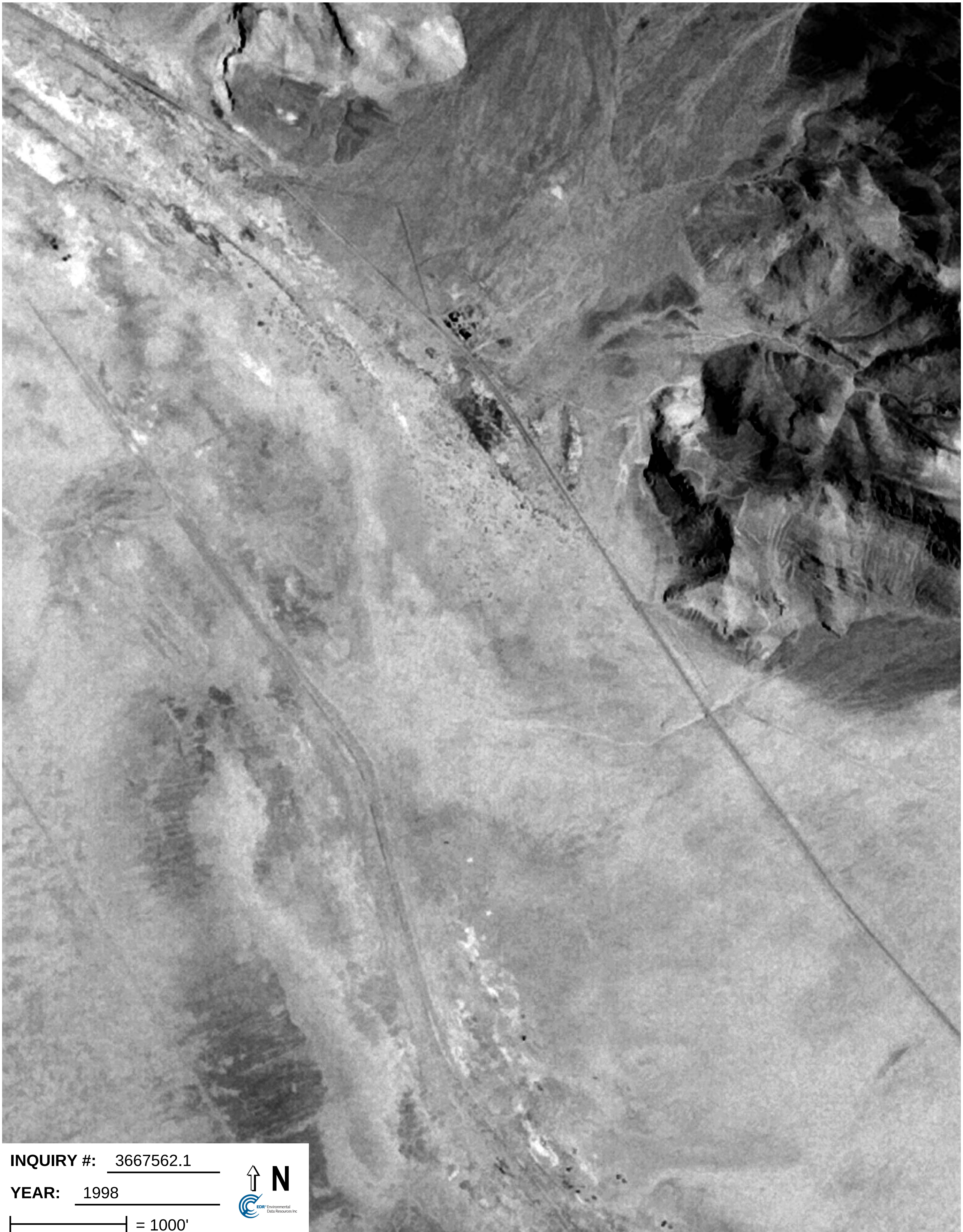
YEAR: 1994
= 1000'
N

INQUIRY #: 3667562.1

YEAR: 1998

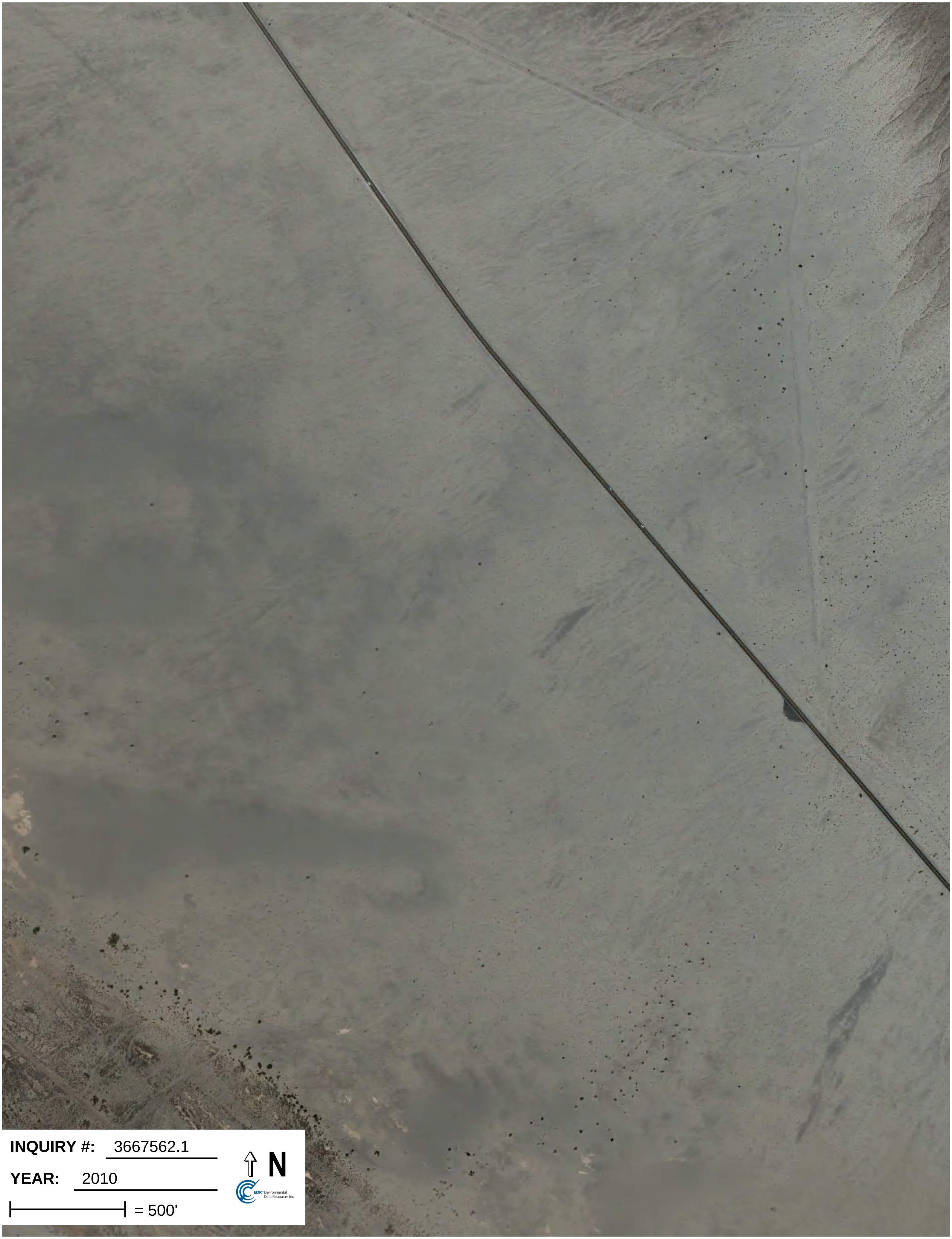
= 1000'

N


INQUIRY #: 3667562.1
YEAR: 1998
= 1000'
N


INQUIRY #: 3667562.1
YEAR: 2005
= 500'
N
EDR Environmental Data Resources Inc


INQUIRY #: 3667562.1
YEAR: 2009
= 500'
N


INQUIRY #: 3667562.1
YEAR: 2010
= 500'
N
EDR Environmental Data Resources Inc


INQUIRY #: 3667562.1
YEAR: 2012
= 500'
N
EDR Environmental Data Resources Inc

APPENDIX D
SANBORN MAP REPORT

Keeler Dunes Dust Control Project

Keeler Dunes Dust Control Project

Keeer, CA 93545

Inquiry Number: 3661888.3

July 10, 2013

Certified Sanborn® Map Report

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

7/10/13

Site Name:	Client Name:
Keeler Dunes Dust Control Keeler Dunes Dust Control Keeer, CA 93545	Sapphos Environmental, Inc. 430 North Halstead Street Pasadena, CA 91107
EDR Inquiry # 3661888.3	Contact: Andre Anderson

EDR® Environmental Data Resources Inc

The complete Sanborn Library collection has been searched by EDR, and fire insurance maps covering the target property location provided by Sapphos Environmental, Inc. were identified for the years listed below. The certified Sanborn Library search results in this report can be authenticated by visiting www.edrnet.com/sanborn and entering the certification number. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by Sanborn Library LLC, the copyright holder for the collection.

Certified Sanborn Results:

Site Name:	Keeler Dunes Dust Control Project
Address:	Keeler Dunes Dust Control Project
City, State, Zip:	Keeer, CA 93545
Cross Street:	
P.O. #	NA
Project:	NA
Certification #	CACE-49EA-93F8

Sanborn® Library search results
Certification # CACE-49EA-93F8

UNMAPPED PROPERTY

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

The Sanborn Library includes more than 1.2 million Sanborn fire insurance maps, which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ✔ Library of Congress
- ✔ University Publications of America
- ✔ EDR Private Collection

The Sanborn Library LLC Since 1866™

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APPENDIX E
ENVIRONMENTAL REGULATORY DATABASES

Keeler Dunes Dust Control Project
Keeler, CA 93545

Inquiry Number: 3661888.1s
July 11, 2013

EDR DataMap™ Area Study

Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
Toll Free: 800.352.0050
www.edrnet.com

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

TARGET PROPERTY INFORMATION

ADDRESS

KEELER, CA 93545
KEELER, CA 93545

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records within the requested search area for the following databases:

FEDERAL RECORDS

NPL	National Priority List
Proposed NPL	Proposed National Priority List Sites
Delisted NPL	National Priority List Deletions
NPL LIENS	Federal Superfund Liens
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CERC-NFRAP	CERCLIS No Further Remedial Action Planned
LIENS 2	CERCLA Lien Information
CORRACTS	Corrective Action Report
RCRA-TSDF	RCRA - Treatment, Storage and Disposal
RCRA-LQG	RCRA - Large Quantity Generators
RCRA-SQG	RCRA - Small Quantity Generators
RCRA-CESQG	RCRA - Conditionally Exempt Small Quantity Generator
RCRA NonGen / NLR	RCRA - Non Generators
US ENG CONTROLS	Engineering Controls Sites List
US INST CONTROL	Sites with Institutional Controls
ERNS	Emergency Response Notification System
HMIRS	Hazardous Materials Information Reporting System
DOT OPS	Incident and Accident Data
US CDL	Clandestine Drug Labs
US BROWNFIELDS	A Listing of Brownfields Sites
DOD	Department of Defense Sites
FUDS	Formerly Used Defense Sites
LUCIS	Land Use Control Information System
CONSENT	Superfund (CERCLA) Consent Decrees
ROD	Records Of Decision
UMTRA	Uranium Mill Tailings Sites
DEBRIS REGION 9	Torres Martinez Reservation Illegal Dump Site Locations
ODI	Open Dump Inventory
US MINES	Mines Master Index File
TRIS	Toxic Chemical Release Inventory System
TSCA	Toxic Substances Control Act
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
SSTS	Section 7 Tracking Systems

ICIS	Integrated Compliance Information System
PADS	PCB Activity Database System
MLTS	Material Licensing Tracking System
RADINFO	Radiation Information Database
FINDS	Facility Index System/Facility Registry System
RAATS	RCRA Administrative Action Tracking System
RMP	Risk Management Plans
PRP	Potentially Responsible Parties
2020 COR ACTION	2020 Corrective Action Program List
US AIRS	Aerometric Information Retrieval System Facility Subsystem
LEAD SMELTERS	Lead Smelter Sites
FEDERAL FACILITY	Federal Facility Site Information listing
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List
FEMA UST	Underground Storage Tank Listing
SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing
EPA WATCH LIST	EPA WATCH LIST
US FIN ASSUR	Financial Assurance Information
US HIST CDL	National Clandestine Laboratory Register
PCB TRANSFORMER	PCB Transformer Registration Database
COAL ASH DOE	Steam-Electric Plant Operation Data

STATE AND LOCAL RECORDS

HIST Cal-Sites	Historical Calsites Database
CA BOND EXP. PLAN	Bond Expenditure Plan
SCH	School Property Evaluation Program
Toxic Pits	Toxic Pits Cleanup Act Sites
WMUDS/SWAT	Waste Management Unit Database
WDS	Waste Discharge System
NPDES	NPDES Permits Listing
UIC	UIC Listing
Cortese	"Cortese" Hazardous Waste & Substances Sites List
HIST CORTESE	Hazardous Waste & Substance Site List
SWRCY	Recycler Database
LUST	Geotracker's Leaking Underground Fuel Tank Report
CA FID UST	Facility Inventory Database
SLIC	Statewide SLIC Cases
UST	Active UST Facilities
HIST UST	Hazardous Substance Storage Container Database
LIENS	Environmental Liens Listing
CUPA Listings	CUPA Resources List
SWEEPS UST	SWEEPS UST Listing
CHMIRS	California Hazardous Material Incident Report System
LDS	Land Disposal Sites Listing
AST	Aboveground Petroleum Storage Tank Facilities
MCS	Military Cleanup Sites Listing
Notify 65	Proposition 65 Records
DEED	Deed Restriction Listing
VCP	Voluntary Cleanup Program Properties
DRYCLEANERS	Cleaner Facilities
WIP	Well Investigation Program Case List
ENF	Enforcement Action Listing
CDL	Clandestine Drug Labs
RESPONSE	State Response Sites
HAZNET	Facility and Manifest Data

EXECUTIVE SUMMARY

EMI	Emissions Inventory Data
ENVIROSTOR	EnviroStor Database
HAULERS	Registered Waste Tire Haulers Listing
HWP	EnviroStor Permitted Facilities Listing
MWMP	Medical Waste Management Program Listing
PROC	Certified Processors Database
HWT	Registered Hazardous Waste Transporter Database

TRIBAL RECORDS

INDIAN RESERV	Indian Reservations
INDIAN ODI	Report on the Status of Open Dumps on Indian Lands
INDIAN LUST	Leaking Underground Storage Tanks on Indian Land
INDIAN UST	Underground Storage Tanks on Indian Land
INDIAN VCP	Voluntary Cleanup Priority Listing

EDR PROPRIETARY RECORDS

EDR MGP	EDR Proprietary Manufactured Gas Plants
EDR US Hist Auto Stat	EDR Exclusive Historic Gas Stations
EDR US Hist Cleaners	EDR Exclusive Historic Dry Cleaners

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified.

Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STATE AND LOCAL RECORDS

SWF/LF: The Solid Waste Facilities/Landfill Sites records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. The data come from the Integrated Waste Management Board's Solid Waste Information System (SWIS) database.

A review of the SWF/LF list, as provided by EDR, and dated 05/20/2013 has revealed that there are 2 SWF/LF sites within the searched area.

Site	Address	Map ID	Page
KEELER DISPOSAL SITE	OLANCHA DUMP ROAD	1	4
KEELER TRANSFER STATION	END OF OLD STATE HWY 1	1	4

EXECUTIVE SUMMARY

Please refer to the end of the findings report for unmapped orphan sites due to poor or inadequate address information.

MAP FINDINGS SUMMARY

FEDERAL RECORDS

Database	Total Plotted
NPL	0
Proposed NPL	0
Delisted NPL	0
NPL LIENS	0
CERCLIS	0
CERC-NFRAP	0
LIENS 2	0
CORRACTS	0
RCRA-TSDF	0
RCRA-LQG	0
RCRA-SQG	0
RCRA-CESQG	0
RCRA NonGen / NLR	0
US ENG CONTROLS	0
US INST CONTROL	0
ERNS	0
HMIRS	0
DOT OPS	0
US CDL	0
US BROWNFIELDS	0
DOD	0
FUDS	0
LUCIS	0
CONSENT	0
ROD	0
UMTRA	0
DEBRIS REGION 9	0
ODI	0
US MINES	0
TRIS	0
TSCA	0
FTTS	0
HIST FTTS	0
SSTS	0
ICIS	0
PADS	0
MLTS	0
RADINFO	0
FINDS	0
RAATS	0
RMP	0
PRP	0
2020 COR ACTION	0
US AIRS	0
LEAD SMELTERS	0
FEDERAL FACILITY	0
COAL ASH EPA	0
FEMA UST	0

MAP FINDINGS SUMMARY

Database	Total Plotted
SCRD DRYCLEANERS	0
EPA WATCH LIST	0
US FIN ASSUR	0
US HIST CDL	0
PCB TRANSFORMER	0
COAL ASH DOE	0

STATE AND LOCAL RECORDS

Database	Total Plotted
HIST Cal-Sites	0
CA BOND EXP. PLAN	0
SCH	0
Toxic Pits	0
SWF/LF	2
WMUDS/SWAT	0
WDS	0
NPDES	0
UIC	0
Cortese	0
HIST CORTESE	0
SWRCY	0
LUST	0
CA FID UST	0
SLIC	0
UST	0
HIST UST	0
LIENS	0
CUPA Listings	0
SWEEPS UST	0
CHMIRS	0
LDS	0
AST	0
MCS	0
Notify 65	0
DEED	0
VCP	0
DRYCLEANERS	0
WIP	0
ENF	0
CDL	0
RESPONSE	0
HAZNET	0
EMI	0
ENVIROSTOR	0
HAULERS	0
HWP	0
MWMP	0
PROC	0
HWT	0

TRIBAL RECORDS

Database	Total Plotted
INDIAN RESERV	0

MAP FINDINGS SUMMARY

Database	Total Plotted
INDIAN ODI	0
INDIAN LUST	0
INDIAN UST	0
INDIAN VCP	0

EDR PROPRIETARY RECORDS

Database	Total Plotted
EDR MGP	0
EDR US Hist Auto Stat	0
EDR US Hist Cleaners	0

NOTES:

Sites may be listed in more than one database

Map ID Direction Distance Distance (ft.)	Site	Database(s)	EDR ID Number EPA ID Number
1	**KEELER DISPOSAL SITE** **OLANCHA DUMP ROAD** **KEELER, CA**	**SWF/LF**	**S106079109** **N/A**

SWF/LF (SWIS):

Region:	STATE
Facility ID:	14-AA-0002
Lat/Long:	36.4934000 / -117.88403
Owner Name:	City Of Los Angeles Dept Water & Power
Owner Telephone:	7608721104
Owner Address:	Not reported
Owner Address2:	300 Mandich Street
Owner City,St,Zip:	Bishop, CA 93514-3449
Operational Status:	Closed
Operator:	County of Inyo Integrated Waste Mgt.
Operator Phone:	7608735577
Operator Address:	Not reported
Operator Address2:	785 N. Main Street, Suite J
Operator City,St,Zip:	Bishop, CA 93514
Permit Date:	Not reported
Permit Status:	Not reported
Permitted Acreage:	20
Activity:	Solid Waste Disposal Site
Regulation Status:	Permitted
Landuse Name:	Not reported
GIS Source:	GPS
Category:	Disposal
Unit Number:	01
Inspection Frequency:	None
Accepted Waste:	Ash,Metals,Mixed municipal
Closure Date:	12/01/1987
Closure Type:	Estimated
Disposal Acreage:	20
SWIS Num:	14-AA-0002
Waste Discharge Requirement Num:	II
Program Type:	Not reported
Permitted Throughput with Units:	7
Actual Throughput with Units:	Cu Yards/day
Permitted Capacity with Units:	Not reported
Remaining Capacity:	Not reported
Remaining Capacity with Units:	Not reported

1	**KEELER TRANSFER STATION** **END OF OLD STATE HWY 1 MI WEST OF KEELER** **KEELER, CA**	**SWF/LF**	**S102360300** **N/A**

SWF/LF (SWIS):

Region:	STATE
Facility ID:	14-AA-0026
Lat/Long:	36.4934900 / -117.88321
Owner Name:	City Of Los Angeles Dept Water & Power
Owner Telephone:	7608721104
Owner Address:	Not reported
Owner Address2:	300 Mandich Street
Owner City,St,Zip:	Bishop, CA 93514-3449
Operational Status:	Active
Operator:	County of Inyo Integrated Waste Mgt.
Operator Phone:	7608735577
Operator Address:	Not reported
Operator Address2:	785 N. Main Street, Suite J

Map ID Direction Distance Distance (ft.)	Site	Database(s)	EDR ID Number EPA ID Number

KEELER TRANSFER STATION (Continued) **S102360300**

Operator City,St,Zip:	Bishop, CA 93514
Permit Date:	10/22/1996
Permit Status:	Notification
Permitted Acreage:	1
Activity:	Limited Volume Transfer Operation
Regulation Status:	Notification
Landuse Name:	Open Space - Irrigated
GIS Source:	GPS
Category:	Transfer/Processing
Unit Number:	01
Inspection Frequency:	Quarterly
Accepted Waste:	Mixed municipal
Closure Date:	Not reported
Closure Type:	Not reported
Disposal Acreage:	Not reported
SWIS Num:	14-AA-0026
Waste Discharge Requirement Num:	Not reported
Program Type:	Not reported
Permitted Throughput with Units:	20
Actual Throughput with Units:	Cu Yards/day
Permitted Capacity with Units:	20
Remaining Capacity:	Not reported
Remaining Capacity with Units:	Cubic Yards

Count: 28 records

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
BISHOP	S105022772	MILL CREEK MINI MART	BOX 181 RTE 2	93526	HIST CORTESE
BISHOP	S104735549	MILL CREEK MINI MART	PO BOX 181 RTE 2	93526	LUST
INDEPENDENCE	S110654243	CALTRANS INDEPENDENCE YARD	HWY 395	93526	LUST
INDEPENDENCE	S103880569	CAMP MANZANAR	HWY 395	93526	LUST
INDEPENDENCE	S102432962	MANZANAR COUNTY YARD	HWY 395	93526	LUST
INDEPENDENCE	S110741332	MANAZAR	HWY 395	93526	CUPA Listings
INDEPENDENCE	S110654237	MANZANAR COUNTY YARD	HWY 395	93526	LUST
INDEPENDENCE	S102426195	CALTRANS INDEPENDENCE YARD	HWY 395	93526	LUST
INDEPENDENCE	S106927536	INYO COUNTY MANZANAR SHOP/INYO COUNTY RO/ DEPRTME	HWY 395 7 MI S/O IND	93526	SWEEPS UST
INDEPENDENCE	S106928330	L.A. DWP-FISH SPRINGS HATCHERY	HWY 395 S BIG PINE	93526	SWEEPS UST
INDEPENDENCE	U001586585	MANZANAR SHOP 1	HWY 39K 5 MI S/O INDEPENDENCE	93526	HIST UST
INDEPENDENCE	S102434051	MT WHITNEY FISH HATCHERY	STAR RTE 1	93526	HIST CORTESE, LUST
INDEPENDENCE	1011849893	FT INDEPENDENCE TRAVEL PLAZA	135 N USHY 395	93526	FINDS, INDIAN UST
INYO COUNTY	M300002918	STANDARD INDUS MNLS INC	LAWS MILL		US MINES
INYO COUNTY	M300006187	STANDARD INDUSTRIAL MINERALS INC	LAWS MILL		US MINES
INYO COUNTY	M300002747	STANDARD INDUSTRIAL MINERALS INC	LAWS MILL		US MINES
INYO COUNTY	M300006429	STANDARD INDUSTRIAL MINERALS INC	LAWS MILL		US MINES
KEELER	S101612509	OWENS LAKE LANDFILL	HWY 136		WMUDS/SWAT, LDS, ENF
KEELER	S105557941	LAKE OWENS DUST MITIGATION	SOUTHERN ZONES		WDS, ENF
KEELER	1010451739	LA DEPT OF WATER AND POWER KEELER YARD	111 SULFATE RD		FINDS
KEELER	1006838510	KEELER DISPOSAL SITE	1 MI W KEELER ON		FINDS
LONE PINE	S110654232	LONE PINE FIRE DEPT	HWY 395	93545	LUST
LONE PINE	S100356042	LONE PINE FIRE DEPT	HWY 395	93545	HIST CORTESE, LUST
LONE PINE	1014672369	PINE TREE SOLAR PROJECT	22500 JAWBONE CANYON RD	93545	FINDS
LONE PINE	S112186494	LONE PINE AIRPORT	1452 S MAIN STREET HWY	93545	LUST
LONE PINE	1003878506	OWENS LAKE	20 MI SE	93545	CERC-NFRAP
LONE PINE	1003878638	PPG INDUSTRIES BARTLETT PLT	W SHORELINE OF OWENS LAKE	93545	CERC-NFRAP
SHOSHONE	U001586590	SHOSHONE ROAD DEPT YARD	STATE HWY	93526	HIST UST

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

FEDERAL RECORDS

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 04/26/2013
Date Data Arrived at EDR: 05/09/2013
Date Made Active in Reports: 07/10/2013
Number of Days to Update: 62

Source: EPA
Telephone: N/A
Last EDR Contact: 05/09/2013
Next Scheduled EDR Contact: 07/22/2013
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 3
Telephone 215-814-5418

EPA Region 4
Telephone 404-562-8033

EPA Region 5
Telephone 312-886-6686

EPA Region 10
Telephone 206-553-8665

EPA Region 6
Telephone: 214-655-6659

EPA Region 7
Telephone: 913-551-7247

EPA Region 8
Telephone: 303-312-6774

EPA Region 9
Telephone: 415-947-4246

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 04/26/2013
Date Data Arrived at EDR: 05/09/2013
Date Made Active in Reports: 07/10/2013
Number of Days to Update: 62

Source: EPA
Telephone: N/A
Last EDR Contact: 05/09/2013
Next Scheduled EDR Contact: 07/22/2013
Data Release Frequency: Quarterly

DELISTED NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 04/26/2013
Date Data Arrived at EDR: 05/09/2013
Date Made Active in Reports: 07/10/2013
Number of Days to Update: 62

Source: EPA
Telephone: N/A
Last EDR Contact: 05/09/2013
Next Scheduled EDR Contact: 07/22/2013
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 02/04/2013
Date Data Arrived at EDR: 03/01/2013
Date Made Active in Reports: 03/13/2013
Number of Days to Update: 12

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 05/29/2013
Next Scheduled EDR Contact: 09/09/2013
Data Release Frequency: Quarterly

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 02/05/2013
Date Data Arrived at EDR: 03/01/2013
Date Made Active in Reports: 03/13/2013
Number of Days to Update: 12

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 05/29/2013
Next Scheduled EDR Contact: 05/09/2013
Data Release Frequency: Quarterly

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 02/06/2013
Date Data Arrived at EDR: 04/25/2013
Date Made Active in Reports: 05/10/2013
Number of Days to Update: 15

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 04/29/2013
Next Scheduled EDR Contact: 08/12/2013
Data Release Frequency: Varies

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 02/12/2013
Date Data Arrived at EDR: 02/21/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 6

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 07/01/2013
Next Scheduled EDR Contact: 10/14/2013
Data Release Frequency: Quarterly

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 02/12/2013
Date Data Arrived at EDR: 02/15/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 12

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 07/01/2013
Next Scheduled EDR Contact: 10/14/2013
Data Release Frequency: Quarterly

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 02/12/2013
Date Data Arrived at EDR: 02/15/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 12

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 07/01/2013
Next Scheduled EDR Contact: 10/14/2013
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 02/12/2013
Date Data Arrived at EDR: 02/15/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 12

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 07/01/2013
Next Scheduled EDR Contact: 10/14/2013
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 02/12/2013
Date Data Arrived at EDR: 02/15/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 12

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 07/01/2013
Next Scheduled EDR Contact: 10/14/2013
Data Release Frequency: Varies

RCRA NonGen / NLR: RCRA - Non Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 02/12/2013
Date Data Arrived at EDR: 02/15/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 12

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 07/01/2013
Next Scheduled EDR Contact: 10/14/2013
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 03/14/2013	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/29/2013	Telephone: 703-603-0695
Date Made Active in Reports: 05/10/2013	Last EDR Contact: 06/10/2013
Number of Days to Update: 42	Next Scheduled EDR Contact: 09/23/2013
	Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 03/14/2013	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/29/2013	Telephone: 703-603-0695
Date Made Active in Reports: 05/10/2013	Last EDR Contact: 06/10/2013
Number of Days to Update: 42	Next Scheduled EDR Contact: 09/23/2013
	Data Release Frequency: Varies

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/31/2012	Source: National Response Center, United States Coast Guard
Date Data Arrived at EDR: 01/17/2013	Telephone: 202-267-2180
Date Made Active in Reports: 02/15/2013	Last EDR Contact: 07/01/2013
Number of Days to Update: 29	Next Scheduled EDR Contact: 10/14/2013
	Data Release Frequency: Annually

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/31/2012	Source: U.S. Department of Transportation
Date Data Arrived at EDR: 01/03/2013	Telephone: 202-366-4555
Date Made Active in Reports: 02/27/2013	Last EDR Contact: 07/01/2013
Number of Days to Update: 55	Next Scheduled EDR Contact: 10/14/2013
	Data Release Frequency: Annually

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/31/2012	Source: Department of Transporation, Office of Pipeline Safety
Date Data Arrived at EDR: 08/07/2012	Telephone: 202-366-4595
Date Made Active in Reports: 09/18/2012	Last EDR Contact: 05/07/2013
Number of Days to Update: 42	Next Scheduled EDR Contact: 08/19/2013
	Data Release Frequency: Varies

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 03/04/2013
Date Data Arrived at EDR: 03/12/2013
Date Made Active in Reports: 05/10/2013
Number of Days to Update: 59

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 06/03/2013
Next Scheduled EDR Contact: 09/16/2013
Data Release Frequency: Quarterly

US BROWNFIELDS: A Listing of Brownfields Sites

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 12/10/2012
Date Data Arrived at EDR: 12/11/2012
Date Made Active in Reports: 12/20/2012
Number of Days to Update: 9

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 06/25/2013
Next Scheduled EDR Contact: 10/07/2013
Data Release Frequency: Semi-Annually

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 04/19/2013
Next Scheduled EDR Contact: 07/29/2013
Data Release Frequency: Semi-Annually

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 02/26/2013
Date Made Active in Reports: 03/13/2013
Number of Days to Update: 15

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 06/10/2013
Next Scheduled EDR Contact: 09/23/2013
Data Release Frequency: Varies

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 12/09/2005
Date Data Arrived at EDR: 12/11/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 31

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 05/20/2013
Next Scheduled EDR Contact: 09/02/2013
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 01/15/2013
Date Made Active in Reports: 03/13/2013
Number of Days to Update: 57

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 06/25/2013
Next Scheduled EDR Contact: 10/14/2013
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 12/18/2012
Date Data Arrived at EDR: 03/13/2013
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 30

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 06/11/2013
Next Scheduled EDR Contact: 09/23/2013
Data Release Frequency: Annually

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 09/14/2010
Date Data Arrived at EDR: 10/07/2011
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 146

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 05/28/2013
Next Scheduled EDR Contact: 09/09/2013
Data Release Frequency: Varies

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 04/29/2013
Next Scheduled EDR Contact: 08/12/2013
Data Release Frequency: No Update Planned

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 02/05/2013
Date Data Arrived at EDR: 04/18/2013
Date Made Active in Reports: 05/10/2013
Number of Days to Update: 22

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 06/04/2013
Next Scheduled EDR Contact: 09/16/2013
Data Release Frequency: Semi-Annually

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 09/01/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 131

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 05/29/2013
Next Scheduled EDR Contact: 09/09/2013
Data Release Frequency: Annually

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2006
Date Data Arrived at EDR: 09/29/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 64

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 06/25/2013
Next Scheduled EDR Contact: 10/07/2013
Data Release Frequency: Every 4 Years

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 05/28/2013
Next Scheduled EDR Contact: 09/09/2013
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 05/28/2013
Next Scheduled EDR Contact: 09/09/2013
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing

A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 04/29/2013
Next Scheduled EDR Contact: 08/12/2013
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 07/20/2011
Date Data Arrived at EDR: 11/10/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 04/15/2013
Next Scheduled EDR Contact: 07/29/2013
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 11/01/2012
Date Data Arrived at EDR: 01/16/2013
Date Made Active in Reports: 05/10/2013
Number of Days to Update: 114

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 04/19/2013
Next Scheduled EDR Contact: 07/29/2013
Data Release Frequency: Annually

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 03/14/2013
Date Data Arrived at EDR: 03/20/2013
Date Made Active in Reports: 07/10/2013
Number of Days to Update: 112

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 07/10/2013
Next Scheduled EDR Contact: 09/23/2013
Data Release Frequency: Quarterly

RADINFO: Radiation Information Database

The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 04/09/2013
Date Data Arrived at EDR: 04/11/2013
Date Made Active in Reports: 05/10/2013
Number of Days to Update: 29

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 04/11/2013
Next Scheduled EDR Contact: 07/22/2013
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 03/08/2013
Date Data Arrived at EDR: 03/21/2013
Date Made Active in Reports: 07/10/2013
Number of Days to Update: 111

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 06/13/2013
Next Scheduled EDR Contact: 09/23/2013
Data Release Frequency: Quarterly

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 05/08/2012
Date Data Arrived at EDR: 05/25/2012
Date Made Active in Reports: 07/10/2012
Number of Days to Update: 46

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 04/29/2013
Next Scheduled EDR Contact: 08/12/2013
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 02/26/2013
Date Made Active in Reports: 04/19/2013
Number of Days to Update: 52

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 05/30/2013
Next Scheduled EDR Contact: 09/09/2013
Data Release Frequency: Biennially

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 09/01/2007
Date Data Arrived at EDR: 11/19/2008
Date Made Active in Reports: 03/30/2009
Number of Days to Update: 131

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 02/01/2011
Date Data Arrived at EDR: 10/19/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 83

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 05/03/2013
Next Scheduled EDR Contact: 08/12/2013
Data Release Frequency: Varies

COAL ASH DOE: Sleam-Electric Plan Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 04/18/2013
Next Scheduled EDR Contact: 07/29/2013
Data Release Frequency: Varies

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/01/2010
Date Data Arrived at EDR: 02/16/2010
Date Made Active in Reports: 04/12/2010
Number of Days to Update: 55

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 04/18/2013
Next Scheduled EDR Contact: 07/29/2013
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 08/17/2010
Date Data Arrived at EDR: 01/03/2011
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 77

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 06/14/2013
Next Scheduled EDR Contact: 09/23/2013
Data Release Frequency: Varies

FEDERAL FACILITY: Federal Facility Site Information listing
A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 10/09/2012
Date Made Active in Reports: 12/20/2012
Number of Days to Update: 72

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 07/08/2013
Next Scheduled EDR Contact: 10/21/2013
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites
A listing of former lead smelter site locations.

Date of Government Version: 01/29/2013
Date Data Arrived at EDR: 02/14/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 13

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 07/03/2013
Next Scheduled EDR Contact: 10/21/2013
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites
A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 03/04/2013
Date Data Arrived at EDR: 03/15/2013
Date Made Active in Reports: 05/10/2013
Number of Days to Update: 56

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 05/20/2013
Next Scheduled EDR Contact: 09/02/2013
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 02/18/2013
Date Made Active in Reports: 05/10/2013
Number of Days to Update: 81

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 05/10/2013
Next Scheduled EDR Contact: 08/26/2013
Data Release Frequency: Quarterly

US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 01/23/2013
Date Data Arrived at EDR: 01/30/2013
Date Made Active in Reports: 05/10/2013
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-5962
Last EDR Contact: 06/25/2013
Next Scheduled EDR Contact: 10/14/2013
Data Release Frequency: Annually

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 01/23/2013
Date Data Arrived at EDR: 01/30/2013
Date Made Active in Reports: 05/10/2013
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-5962
Last EDR Contact: 06/25/2013
Next Scheduled EDR Contact: 10/14/2013
Data Release Frequency: Annually

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 03/07/2011
Date Data Arrived at EDR: 03/09/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 54

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 05/06/2013
Next Scheduled EDR Contact: 08/05/2013
Data Release Frequency: Varies

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 11/11/2011
Date Data Arrived at EDR: 05/18/2012
Date Made Active in Reports: 05/25/2012
Number of Days to Update: 7

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 05/17/2013
Next Scheduled EDR Contact: 08/26/2013
Data Release Frequency: Varies

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 12/18/2012
Date Data Arrived at EDR: 04/04/2013
Date Made Active in Reports: 07/10/2013
Number of Days to Update: 97

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 07/03/2013
Next Scheduled EDR Contact: 10/14/2013
Data Release Frequency: Quarterly

STATE AND LOCAL RECORDS

HIST CAL-SITES: Calsites Database

The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/03/2006
Date Made Active in Reports: 08/24/2006
Number of Days to Update: 21

Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2009
Next Scheduled EDR Contact: 05/25/2009
Data Release Frequency: No Update Planned

CA BOND EXP. PLAN: Bond Expenditure Plan

Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6

Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SCH: School Property Evaluation Program

This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 05/06/2013
Date Data Arrived at EDR: 05/07/2013
Date Made Active in Reports: 06/25/2013
Number of Days to Update: 49

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 05/07/2013
Next Scheduled EDR Contact: 08/19/2013
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

TOXIC PITS: Toxic Pits Cleanup Act Sites

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

SWF/LF (SWIS): Solid Waste Information System

Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 05/20/2013
Date Data Arrived at EDR: 05/21/2013
Date Made Active in Reports: 06/25/2013
Number of Days to Update: 35

Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 05/21/2013
Next Scheduled EDR Contact: 09/02/2013
Data Release Frequency: Quarterly

UIC: UIC Listing

A listing of underground control injection wells.

Date of Government Version: 03/05/2013
Date Data Arrived at EDR: 03/19/2013
Date Made Active in Reports: 03/27/2013
Number of Days to Update: 8

Source: Deaprtment of Conservation
Telephone: 916-445-2408
Last EDR Contact: 06/21/2013
Next Scheduled EDR Contact: 12/31/2012
Data Release Frequency: Varies

WMUDS/SWAT: Waste Management Unit Database

Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 05/10/2013
Next Scheduled EDR Contact: 08/26/2013
Data Release Frequency: No Update Planned

WDS: Waste Discharge System

Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9

Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 05/28/2013
Next Scheduled EDR Contact: 09/09/2013
Data Release Frequency: Quarterly

NPDES: NPDES Permits Listing

A listing of NPDES permits, including stormwater.

Date of Government Version: 05/20/2013
Date Data Arrived at EDR: 05/21/2013
Date Made Active in Reports: 06/12/2013
Number of Days to Update: 22

Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 05/21/2013
Next Scheduled EDR Contact: 09/02/2013
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CORTESE: "Cortese" Hazardous Waste & Substances Sites List

The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 04/01/2013
Date Data Arrived at EDR: 04/02/2013
Date Made Active in Reports: 05/14/2013
Number of Days to Update: 42

Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 07/05/2013
Next Scheduled EDR Contact: 10/14/2013
Data Release Frequency: Quarterly

HIST CORTESE: Hazardous Waste & Substance Site List

The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 01/22/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SWRCY: Recycler Database

A listing of recycling facilities in California.

Date of Government Version: 03/18/2013
Date Data Arrived at EDR: 03/19/2013
Date Made Active in Reports: 03/27/2013
Number of Days to Update: 8

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 06/17/2013
Next Scheduled EDR Contact: 09/30/2013
Data Release Frequency: Quarterly

LUST REG 9: Leaking Underground Storage Tank Report

Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board’s LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 09/26/2011
Next Scheduled EDR Contact: 01/09/2012
Data Release Frequency: No Update Planned

LUST REG 6V: Leaking Underground Storage Tank Case Listing

Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22

Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 6L: Leaking Underground Storage Tank Case Listing

For more current information, please refer to the State Water Resources Control Board’s LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 5: Leaking Underground Storage Tank Database

Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

LUST REG 4: Underground Storage Tank Leak List
Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

LUST REG 3: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

LUST REG 2: Fuel Leak List
Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

LUST REG 1: Active Toxic Site Investigation
Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST: Geotracker's Leaking Underground Fuel Tank Report
Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state. For more information on a particular leaking underground storage tank sites, please contact the appropriate regulatory agency.

Date of Government Version: 06/17/2013
Date Data Arrived at EDR: 06/17/2013
Date Made Active in Reports: 06/27/2013
Number of Days to Update: 10

Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 06/17/2013
Next Scheduled EDR Contact: 09/30/2013
Data Release Frequency: Quarterly

LUST REG 7: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-776-8943
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 8: Leaking Underground Storage Tanks

California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Varies

CA FID UST: Facility Inventory Database

The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SLIC: Statewide SLIC Cases

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 06/17/2013
Date Data Arrived at EDR: 06/17/2013
Date Made Active in Reports: 06/27/2013
Number of Days to Update: 10

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/17/2013
Next Scheduled EDR Contact: 09/30/2013
Data Release Frequency: Varies

SLIC REG 1: Active Toxic Site Investigations

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: Semi-Annually

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Varies

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Semi-Annually

SLIC REG 6L: SLIC Sites
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 7: SLIC List
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36

Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11

Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 08/08/2011
Next Scheduled EDR Contact: 11/21/2011
Data Release Frequency: Annually

UST: Active UST Facilities
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 06/17/2013
Date Data Arrived at EDR: 06/17/2013
Date Made Active in Reports: 06/27/2013
Number of Days to Update: 10

Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 06/17/2013
Next Scheduled EDR Contact: 09/30/2013
Data Release Frequency: Semi-Annually

UST MENDOCINO: Mendocino County UST Database
A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 09/23/2009
Date Data Arrived at EDR: 09/23/2009
Date Made Active in Reports: 10/01/2009
Number of Days to Update: 8

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 06/03/2013
Next Scheduled EDR Contact: 09/16/2013
Data Release Frequency: Annually

HIST UST: Hazardous Substance Storage Container Database
The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

LIENS: Environmental Liens Listing
A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 03/15/2013
Date Data Arrived at EDR: 03/15/2013
Date Made Active in Reports: 03/27/2013
Number of Days to Update: 12

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 06/10/2013
Next Scheduled EDR Contact: 09/23/2013
Data Release Frequency: Varies

SWEEPS UST: SWEEPS UST Listing
Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CHMIRS: California Hazardous Material Incident Report System

California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 03/12/2013
Date Data Arrived at EDR: 05/01/2013
Date Made Active in Reports: 06/25/2013
Number of Days to Update: 55

Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 05/01/2013
Next Scheduled EDR Contact: 08/12/2013
Data Release Frequency: Varies

LDS: Land Disposal Sites Listing

The Land Disposal program regulates of waste discharge to land for treatment, storage and disposal in waste management units.

Date of Government Version: 06/17/2013
Date Data Arrived at EDR: 06/17/2013
Date Made Active in Reports: 06/27/2013
Number of Days to Update: 10

Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/17/2013
Next Scheduled EDR Contact: 09/30/2013
Data Release Frequency: Quarterly

AST: Aboveground Petroleum Storage Tank Facilities

Registered Aboveground Storage Tanks.

Date of Government Version: 08/01/2009
Date Data Arrived at EDR: 09/10/2009
Date Made Active in Reports: 10/01/2009
Number of Days to Update: 21

Source: State Water Resources Control Board
Telephone: 916-327-5092
Last EDR Contact: 07/03/2013
Next Scheduled EDR Contact: 10/21/2013
Data Release Frequency: Quarterly

MCS: Military Cleanup Sites Listing

The State Water Resources Control Board and nine Regional Water Quality Control Boards partner with the Department of Defense (DoD) through the Defense and State Memorandum of Agreement (DSMOA) to oversee the investigation and remediation of water quality issues at military facilities.

Date of Government Version: 06/17/2013
Date Data Arrived at EDR: 06/17/2013
Date Made Active in Reports: 06/27/2013
Number of Days to Update: 10

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 06/17/2013
Next Scheduled EDR Contact: 09/30/2013
Data Release Frequency: Quarterly

NOTIFY 65: Proposition 65 Records

Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

Date of Government Version: 10/21/1993
Date Data Arrived at EDR: 11/01/1993
Date Made Active in Reports: 11/19/1993
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 06/18/2013
Next Scheduled EDR Contact: 10/07/2013
Data Release Frequency: No Update Planned

DEED: Deed Restriction Listing

Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 03/11/2013
Date Data Arrived at EDR: 03/12/2013
Date Made Active in Reports: 03/25/2013
Number of Days to Update: 13

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 06/11/2013
Next Scheduled EDR Contact: 09/23/2013
Data Release Frequency: Semi-Annually

VCP: Voluntary Cleanup Program Properties

Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 05/06/2013
Date Data Arrived at EDR: 05/07/2013
Date Made Active in Reports: 06/25/2013
Number of Days to Update: 49

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 05/07/2013
Next Scheduled EDR Contact: 08/19/2013
Data Release Frequency: Quarterly

DRYCLEANERS: Cleaner Facilities

A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 12/11/2012
Date Data Arrived at EDR: 12/12/2012
Date Made Active in Reports: 01/04/2013
Number of Days to Update: 23

Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 06/18/2013
Next Scheduled EDR Contact: 12/24/2012
Data Release Frequency: Annually

WIP: Well Investigation Program Case List

Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009
Date Data Arrived at EDR: 07/21/2009
Date Made Active in Reports: 08/03/2009
Number of Days to Update: 13

Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 06/25/2013
Next Scheduled EDR Contact: 10/14/2013
Data Release Frequency: Varies

CDL: Clandestine Drug Labs

A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 04/03/2013
Date Made Active in Reports: 05/14/2013
Number of Days to Update: 41

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 06/25/2013
Next Scheduled EDR Contact: 10/14/2013
Data Release Frequency: Varies

ENF: Enforcement Action Listing

A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

Date of Government Version: 04/26/2013
Date Data Arrived at EDR: 04/29/2013
Date Made Active in Reports: 05/16/2013
Number of Days to Update: 17

Source: State Water Resoruces Control Board
Telephone: 916-445-9379
Last EDR Contact: 04/26/2013
Next Scheduled EDR Contact: 08/12/2013
Data Release Frequency: Varies

RESPONSE: State Response Sites

Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 05/06/2013
Date Data Arrived at EDR: 05/07/2013
Date Made Active in Reports: 06/25/2013
Number of Days to Update: 49

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 05/07/2013
Next Scheduled EDR Contact: 08/19/2013
Data Release Frequency: Quarterly

HAZNET: Facility and Manifest Data

Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 06/22/2012
Date Made Active in Reports: 07/06/2012
Number of Days to Update: 14

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 04/19/2013
Next Scheduled EDR Contact: 07/29/2013
Data Release Frequency: Annually

EMI: Emissions Inventory Data

Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2008
Date Data Arrived at EDR: 09/29/2010
Date Made Active in Reports: 10/18/2010
Number of Days to Update: 19

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 06/25/2013
Next Scheduled EDR Contact: 10/07/2013
Data Release Frequency: Varies

HAULERS: Registered Waste Tire Haulers Listing

A listing of registered waste tire haulers.

Date of Government Version: 04/26/2013
Date Data Arrived at EDR: 04/26/2013
Date Made Active in Reports: 05/16/2013
Number of Days to Update: 20

Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 06/25/2013
Next Scheduled EDR Contact: 09/02/2013
Data Release Frequency: Varies

ENVIROSTOR: EnviroStor Database

The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 05/06/2013
Date Data Arrived at EDR: 05/07/2013
Date Made Active in Reports: 06/25/2013
Number of Days to Update: 49

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 05/07/2013
Next Scheduled EDR Contact: 08/19/2013
Data Release Frequency: Quarterly

HWT: Registered Hazardous Waste Transporter Database

A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

Date of Government Version: 04/15/2013
Date Data Arrived at EDR: 04/16/2013
Date Made Active in Reports: 05/17/2013
Number of Days to Update: 31

Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 04/16/2013
Next Scheduled EDR Contact: 07/29/2013
Data Release Frequency: Quarterly

MWMP: Medical Waste Management Program Listing

The Medical Waste Management Program (MWMP) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste Offsite Treatment Facilities (PDF) and Transfer Stations (PDF) throughout the state. MWMP also oversees all Medical Waste Transporters.

Date of Government Version: 03/06/2013
Date Data Arrived at EDR: 03/12/2013
Date Made Active in Reports: 03/25/2013
Number of Days to Update: 13

Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 06/10/2013
Next Scheduled EDR Contact: 09/23/2013
Data Release Frequency: Varies

PROC: Certified Processors Database

A listing of certified processors.

Date of Government Version: 03/18/2013
Date Data Arrived at EDR: 03/19/2013
Date Made Active in Reports: 03/27/2013
Number of Days to Update: 8

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 06/17/2013
Next Scheduled EDR Contact: 09/30/2013
Data Release Frequency: Quarterly

HWP: EnviroStor Permitted Facilities Listing

Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 05/28/2013
Date Data Arrived at EDR: 05/29/2013
Date Made Active in Reports: 06/27/2013
Number of Days to Update: 29

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 05/29/2013
Next Scheduled EDR Contact: 09/09/2013
Data Release Frequency: Quarterly

TRIBAL RECORDS

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 12/08/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 34

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 04/19/2013
Next Scheduled EDR Contact: 07/29/2013
Data Release Frequency: Semi-Annually

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands

Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 05/03/2013
Next Scheduled EDR Contact: 08/19/2013
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 08/27/2012
Date Data Arrived at EDR: 08/28/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 49

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 04/29/2013
Next Scheduled EDR Contact: 08/12/2013
Data Release Frequency: Quarterly

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 02/28/2013
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 43

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 04/29/2013
Next Scheduled EDR Contact: 08/12/2013
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 02/06/2013
Date Data Arrived at EDR: 02/08/2013
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 63

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 04/29/2013
Next Scheduled EDR Contact: 08/12/2013
Data Release Frequency: Semi-Annually

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 09/28/2012
Date Data Arrived at EDR: 11/01/2012
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 162

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 05/01/2013
Next Scheduled EDR Contact: 08/12/2013
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 03/01/2013
Date Data Arrived at EDR: 03/01/2013
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 42

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 04/29/2013
Next Scheduled EDR Contact: 08/12/2013
Data Release Frequency: Quarterly

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 02/05/2013
Date Data Arrived at EDR: 02/06/2013
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 65

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 04/29/2013
Next Scheduled EDR Contact: 08/12/2013
Data Release Frequency: Quarterly

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 09/12/2011
Date Data Arrived at EDR: 09/13/2011
Date Made Active in Reports: 11/11/2011
Number of Days to Update: 59

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 04/29/2013
Next Scheduled EDR Contact: 08/12/2013
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 09/28/2012
Date Data Arrived at EDR: 11/07/2012
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 156

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 04/29/2013
Next Scheduled EDR Contact: 08/12/2013
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 02/06/2013
Date Data Arrived at EDR: 02/08/2013
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 63

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 04/29/2013
Next Scheduled EDR Contact: 08/12/2013
Data Release Frequency: Semi-Annually

INDIAN UST R5: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 08/02/2012
Date Data Arrived at EDR: 08/03/2012
Date Made Active in Reports: 11/05/2012
Number of Days to Update: 94

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 04/29/2013
Next Scheduled EDR Contact: 08/12/2013
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 05/10/2011
Date Data Arrived at EDR: 05/11/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 34

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 04/29/2013
Next Scheduled EDR Contact: 08/12/2013
Data Release Frequency: Semi-Annually

INDIAN UST R7: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 02/28/2013
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 43

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 04/29/2013
Next Scheduled EDR Contact: 08/12/2013
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 08/27/2012
Date Data Arrived at EDR: 08/28/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 49

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 04/29/2013
Next Scheduled EDR Contact: 08/12/2013
Data Release Frequency: Quarterly

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 02/21/2013
Date Data Arrived at EDR: 02/26/2013
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 45

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 04/29/2013
Next Scheduled EDR Contact: 08/12/2013
Data Release Frequency: Quarterly

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 02/05/2013
Date Data Arrived at EDR: 02/06/2013
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 65

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 04/29/2013
Next Scheduled EDR Contact: 08/12/2013
Data Release Frequency: Quarterly

INDIAN VCP R1: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 09/28/2012
Date Data Arrived at EDR: 10/02/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 14

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 07/02/2013
Next Scheduled EDR Contact: 10/14/2013
Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng

A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

EDR PROPRIETARY RECORDS

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR’s researchers. Manufactured gas sites were used in the United States from the 1800’s to 1950’s to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR US Hist Auto Stat: EDR Exclusive Historic Gas Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Cleaners: EDR Exclusive Historic Dry Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Cleaners: EDR Proprietary Historic Dry Cleaners - Cole

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: N/A
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Auto Stat: EDR Proprietary Historic Gas Stations - Cole

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: N/A
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

COUNTY RECORDS

ALAMEDA COUNTY:

Contaminated Sites

A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 04/15/2013
Date Data Arrived at EDR: 04/16/2013
Date Made Active in Reports: 05/16/2013
Number of Days to Update: 30

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 06/28/2013
Next Scheduled EDR Contact: 10/14/2013
Data Release Frequency: Semi-Annually

Underground Tanks
Underground storage tank sites located in Alameda county.

Date of Government Version: 04/15/2013
Date Data Arrived at EDR: 04/16/2013
Date Made Active in Reports: 05/16/2013
Number of Days to Update: 30

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 06/28/2013
Next Scheduled EDR Contact: 10/14/2013
Data Release Frequency: Semi-Annually

AMADOR COUNTY:

CUPA Facility List
Cupa Facility List

Date of Government Version: 03/13/2013
Date Data Arrived at EDR: 03/14/2013
Date Made Active in Reports: 04/04/2013
Number of Days to Update: 21

Source: Amador County Environmental Health
Telephone: 209-223-6439
Last EDR Contact: 06/18/2013
Next Scheduled EDR Contact: 09/23/2013
Data Release Frequency: Varies

BUTTE COUNTY:

CUPA Facility Listing
Cupa facility list.

Date of Government Version: 10/16/2012
Date Data Arrived at EDR: 10/17/2012
Date Made Active in Reports: 11/13/2012
Number of Days to Update: 27

Source: Public Health Department
Telephone: 530-538-7149
Last EDR Contact: 04/26/2013
Next Scheduled EDR Contact: 04/29/2013
Data Release Frequency: Varies

CALVERAS COUNTY:

CUPA Facility Listing
Cupa Facility Listing

Date of Government Version: 04/16/2013
Date Data Arrived at EDR: 04/17/2013
Date Made Active in Reports: 05/16/2013
Number of Days to Update: 29

Source: Calveras County Environmental Health
Telephone: 209-754-6399
Last EDR Contact: 06/25/2013
Next Scheduled EDR Contact: 10/14/2013
Data Release Frequency: Quarterly

COLUSA COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 01/04/2013
Date Data Arrived at EDR: 01/14/2013
Date Made Active in Reports: 03/01/2013
Number of Days to Update: 46

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 06/13/2013
Next Scheduled EDR Contact: 08/26/2013
Data Release Frequency: Varies

CONTRA COSTA COUNTY:

Site List

List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 04/09/2013
Date Data Arrived at EDR: 04/10/2013
Date Made Active in Reports: 05/14/2013
Number of Days to Update: 34

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 05/06/2013
Next Scheduled EDR Contact: 08/19/2013
Data Release Frequency: Semi-Annually

DEL NORTE COUNTY:

CUPA Facility List

Cupa Facility list

Date of Government Version: 01/09/2013
Date Data Arrived at EDR: 01/10/2013
Date Made Active in Reports: 02/25/2013
Number of Days to Update: 46

Source: Del Norte County Environmental Health Division
Telephone: 707-465-0426
Last EDR Contact: 05/06/2013
Next Scheduled EDR Contact: 08/19/2013
Data Release Frequency: Varies

EL DORADO COUNTY:

CUPA Facility List

CUPA facility list.

Date of Government Version: 05/20/2013
Date Data Arrived at EDR: 05/21/2013
Date Made Active in Reports: 06/25/2013
Number of Days to Update: 35

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 05/06/2013
Next Scheduled EDR Contact: 08/19/2013
Data Release Frequency: Varies

FRESNO COUNTY:

CUPA Resources List

Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 03/31/2013
Date Data Arrived at EDR: 04/16/2013
Date Made Active in Reports: 05/16/2013
Number of Days to Update: 30

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 04/15/2013
Next Scheduled EDR Contact: 07/29/2013
Data Release Frequency: Semi-Annually

HUMBOLDT COUNTY:

CUPA Facility List

CUPA facility list.

Date of Government Version: 03/15/2013
Date Data Arrived at EDR: 03/19/2013
Date Made Active in Reports: 03/27/2013
Number of Days to Update: 8

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 05/28/2013
Next Scheduled EDR Contact: 09/09/2013
Data Release Frequency: Varies

IMPERIAL COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 05/01/2012
Date Data Arrived at EDR: 05/02/2012
Date Made Active in Reports: 06/11/2012
Number of Days to Update: 40

Source: San Diego Border Field Office
Telephone: 760-339-2777
Last EDR Contact: 04/29/2013
Next Scheduled EDR Contact: 08/12/2013
Data Release Frequency: Varies

INYO COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 06/26/2012
Date Data Arrived at EDR: 06/27/2012
Date Made Active in Reports: 08/17/2012
Number of Days to Update: 51

Source: Inyo County Environmental Health Services
Telephone: 760-878-0238
Last EDR Contact: 05/28/2013
Next Scheduled EDR Contact: 09/09/2013
Data Release Frequency: Varies

KERN COUNTY:

Underground Storage Tank Sites & Tank Listing
Kern County Sites and Tanks Listing.

Date of Government Version: 08/31/2010
Date Data Arrived at EDR: 09/01/2010
Date Made Active in Reports: 09/30/2010
Number of Days to Update: 29

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 05/10/2013
Next Scheduled EDR Contact: 08/26/2013
Data Release Frequency: Quarterly

KINGS COUNTY:

CUPA Facility List
A listing of sites included in the county?s Certified Unified Program Agency database. California?s Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 02/12/2013
Date Data Arrived at EDR: 02/13/2013
Date Made Active in Reports: 03/21/2013
Number of Days to Update: 36

Source: Kings County Department of Public Health
Telephone: 559-584-1411
Last EDR Contact: 06/10/2013
Next Scheduled EDR Contact: 09/09/2013
Data Release Frequency: Varies

LAKE COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 01/23/2013
Date Data Arrived at EDR: 01/25/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 33

Source: Lake County Environmental Health
Telephone: 707-263-1164
Last EDR Contact: 04/19/2013
Next Scheduled EDR Contact: 08/05/2013
Data Release Frequency: Varies

LOS ANGELES COUNTY:

San Gabriel Valley Areas of Concern
San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office.

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 10/23/2009
Number of Days to Update: 206

Source: EPA Region 9
Telephone: 415-972-3178
Last EDR Contact: 07/08/2013
Next Scheduled EDR Contact: 10/07/2013
Data Release Frequency: No Update Planned

HMS: Street Number List
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 10/31/2012
Date Data Arrived at EDR: 12/28/2012
Date Made Active in Reports: 01/25/2013
Number of Days to Update: 28

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 04/15/2013
Next Scheduled EDR Contact: 07/29/2013
Data Release Frequency: Semi-Annually

List of Solid Waste Facilities
Solid Waste Facilities in Los Angeles County.

Date of Government Version: 04/24/2013
Date Data Arrived at EDR: 04/24/2013
Date Made Active in Reports: 05/17/2013
Number of Days to Update: 23

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 04/24/2013
Next Scheduled EDR Contact: 08/05/2013
Data Release Frequency: Varies

City of Los Angeles Landfills
Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 03/05/2009
Date Data Arrived at EDR: 03/10/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 29

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 05/20/2013
Next Scheduled EDR Contact: 09/02/2013
Data Release Frequency: Varies

Site Mitigation List
Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 01/30/2013
Date Data Arrived at EDR: 02/21/2013
Date Made Active in Reports: 03/25/2013
Number of Days to Update: 32

Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 04/19/2013
Next Scheduled EDR Contact: 08/05/2013
Data Release Frequency: Annually

City of El Segundo Underground Storage Tank
Underground storage tank sites located in El Segundo city.

Date of Government Version: 04/22/2013
Date Data Arrived at EDR: 04/29/2013
Date Made Active in Reports: 05/17/2013
Number of Days to Update: 18

Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 04/19/2013
Next Scheduled EDR Contact: 08/05/2013
Data Release Frequency: Semi-Annually

City of Long Beach Underground Storage Tank
Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 03/28/2003
Date Data Arrived at EDR: 10/23/2003
Date Made Active in Reports: 11/26/2003
Number of Days to Update: 34

Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 04/26/2013
Next Scheduled EDR Contact: 08/12/2013
Data Release Frequency: Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

City of Torrance Underground Storage Tank

Underground storage tank sites located in the city of Torrance.

Date of Government Version: 04/15/2013
Date Data Arrived at EDR: 04/16/2013
Date Made Active in Reports: 05/17/2013
Number of Days to Update: 31

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 04/15/2013
Next Scheduled EDR Contact: 07/29/2013
Data Release Frequency: Semi-Annually

MADERA COUNTY:

CUPA Facility List

A listing of sites included in the county?s Certified Unified Program Agency database. California?s Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 04/15/2013
Date Data Arrived at EDR: 04/16/2013
Date Made Active in Reports: 05/17/2013
Number of Days to Update: 31

Source: Madera County Environmental Health
Telephone: 559-675-7823
Last EDR Contact: 05/28/2013
Next Scheduled EDR Contact: 09/09/2013
Data Release Frequency: Varies

MARIN COUNTY:

Underground Storage Tank Sites

Currently permitted USTs in Marin County.

Date of Government Version: 11/26/2012
Date Data Arrived at EDR: 11/28/2012
Date Made Active in Reports: 01/21/2013
Number of Days to Update: 54

Source: Public Works Department Waste Management
Telephone: 415-499-6647
Last EDR Contact: 07/03/2013
Next Scheduled EDR Contact: 10/21/2013
Data Release Frequency: Semi-Annually

MERCED COUNTY:

CUPA Facility List

CUPA facility list.

Date of Government Version: 05/28/2013
Date Data Arrived at EDR: 05/29/2013
Date Made Active in Reports: 06/25/2013
Number of Days to Update: 27

Source: Merced County Environmental Health
Telephone: 209-381-1094
Last EDR Contact: 02/25/2013
Next Scheduled EDR Contact: 09/09/2013
Data Release Frequency: Varies

MONO COUNTY:

CUPA Facility List

CUPA Facility List

Date of Government Version: 03/04/2013
Date Data Arrived at EDR: 03/08/2013
Date Made Active in Reports: 03/25/2013
Number of Days to Update: 17

Source: Mono County Health Department
Telephone: 760-932-5580
Last EDR Contact: 06/03/2013
Next Scheduled EDR Contact: 09/16/2013
Data Release Frequency: Varies

MONTEREY COUNTY:

CUPA Facility Listing
CUPA Program listing from the Environmental Health Division.

Date of Government Version: 03/14/2013
Date Data Arrived at EDR: 03/15/2013
Date Made Active in Reports: 03/27/2013
Number of Days to Update: 12

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 05/28/2013
Next Scheduled EDR Contact: 09/09/2013
Data Release Frequency: Varies

NAPA COUNTY:

Sites With Reported Contamination
A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 12/05/2011
Date Data Arrived at EDR: 12/06/2011
Date Made Active in Reports: 02/07/2012
Number of Days to Update: 63

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 06/03/2013
Next Scheduled EDR Contact: 09/16/2013
Data Release Frequency: No Update Planned

Closed and Operating Underground Storage Tank Sites
Underground storage tank sites located in Napa county.

Date of Government Version: 01/15/2008
Date Data Arrived at EDR: 01/16/2008
Date Made Active in Reports: 02/08/2008
Number of Days to Update: 23

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 06/03/2013
Next Scheduled EDR Contact: 09/16/2013
Data Release Frequency: No Update Planned

NEVADA COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 03/08/2013
Date Data Arrived at EDR: 03/08/2013
Date Made Active in Reports: 03/25/2013
Number of Days to Update: 17

Source: Community Development Agency
Telephone: 530-265-1467
Last EDR Contact: 05/17/2013
Next Scheduled EDR Contact: 08/19/2013
Data Release Frequency: Varies

ORANGE COUNTY:

List of Industrial Site Cleanups
Petroleum and non-petroleum spills.

Date of Government Version: 05/01/2013
Date Data Arrived at EDR: 05/15/2013
Date Made Active in Reports: 06/12/2013
Number of Days to Update: 28

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 05/10/2013
Next Scheduled EDR Contact: 08/26/2013
Data Release Frequency: Annually

List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 05/01/2013
Date Data Arrived at EDR: 05/15/2013
Date Made Active in Reports: 06/25/2013
Number of Days to Update: 41

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 05/10/2013
Next Scheduled EDR Contact: 08/26/2013
Data Release Frequency: Quarterly

List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 05/01/2013
Date Data Arrived at EDR: 05/15/2013
Date Made Active in Reports: 06/25/2013
Number of Days to Update: 41

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 05/10/2013
Next Scheduled EDR Contact: 08/26/2013
Data Release Frequency: Quarterly

PLACER COUNTY:

Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 03/12/2013
Date Data Arrived at EDR: 03/13/2013
Date Made Active in Reports: 03/27/2013
Number of Days to Update: 14

Source: Placer County Health and Human Services
Telephone: 530-745-2363
Last EDR Contact: 06/10/2013
Next Scheduled EDR Contact: 09/23/2013
Data Release Frequency: Semi-Annually

RIVERSIDE COUNTY:

Listing of Underground Tank Cleanup Sites
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 04/23/2013
Date Data Arrived at EDR: 04/24/2013
Date Made Active in Reports: 05/17/2013
Number of Days to Update: 23

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 06/18/2013
Next Scheduled EDR Contact: 10/07/2013
Data Release Frequency: Quarterly

Underground Storage Tank Tank List
Underground storage tank sites located in Riverside county.

Date of Government Version: 04/23/2013
Date Data Arrived at EDR: 04/24/2013
Date Made Active in Reports: 05/16/2013
Number of Days to Update: 22

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 06/18/2013
Next Scheduled EDR Contact: 10/07/2013
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

Toxic Site Clean-Up List
List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 02/04/2013
Date Data Arrived at EDR: 04/11/2013
Date Made Active in Reports: 05/14/2013
Number of Days to Update: 33

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 07/05/2013
Next Scheduled EDR Contact: 10/21/2013
Data Release Frequency: Quarterly

Master Hazardous Materials Facility List
Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 02/04/2013
Date Data Arrived at EDR: 04/12/2013
Date Made Active in Reports: 05/16/2013
Number of Days to Update: 34

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 07/05/2013
Next Scheduled EDR Contact: 10/21/2013
Data Release Frequency: Quarterly

SAN BERNARDINO COUNTY:

Hazardous Material Permits

This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 03/04/2013
Date Data Arrived at EDR: 03/05/2013
Date Made Active in Reports: 03/25/2013
Number of Days to Update: 20

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 05/13/2013
Next Scheduled EDR Contact: 08/26/2013
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

Hazardous Materials Management Division Database

The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 08/17/2012
Date Data Arrived at EDR: 08/20/2012
Date Made Active in Reports: 10/03/2012
Number of Days to Update: 44

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 06/10/2013
Next Scheduled EDR Contact: 09/23/2013
Data Release Frequency: Quarterly

Solid Waste Facilities

San Diego County Solid Waste Facilities.

Date of Government Version: 10/31/2012
Date Data Arrived at EDR: 11/06/2012
Date Made Active in Reports: 11/30/2012
Number of Days to Update: 24

Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 04/26/2013
Next Scheduled EDR Contact: 08/12/2013
Data Release Frequency: Varies

Environmental Case Listing

The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010
Date Data Arrived at EDR: 06/15/2010
Date Made Active in Reports: 07/09/2010
Number of Days to Update: 24

Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 06/10/2013
Next Scheduled EDR Contact: 09/23/2013
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

Local Oversite Facilities

A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 09/29/2008
Number of Days to Update: 10

Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 05/10/2013
Next Scheduled EDR Contact: 08/26/2013
Data Release Frequency: Quarterly

Underground Storage Tank Information
Underground storage tank sites located in San Francisco county.

Date of Government Version: 11/29/2010
Date Data Arrived at EDR: 03/10/2011
Date Made Active in Reports: 03/15/2011
Number of Days to Update: 5

Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 05/10/2013
Next Scheduled EDR Contact: 08/26/2013
Data Release Frequency: Quarterly

SAN JOAQUIN COUNTY:

San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 03/25/2013
Date Data Arrived at EDR: 03/25/2013
Date Made Active in Reports: 04/18/2013
Number of Days to Update: 24

Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 06/18/2013
Next Scheduled EDR Contact: 10/07/2013
Data Release Frequency: Semi-Annually

SAN LUIS OBISPO COUNTY:

CUPA Facility List
Cupa Facility List.

Date of Government Version: 02/26/2013
Date Data Arrived at EDR: 02/26/2013
Date Made Active in Reports: 03/25/2013
Number of Days to Update: 27

Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 05/28/2013
Next Scheduled EDR Contact: 09/09/2013
Data Release Frequency: Varies

SAN MATEO COUNTY:

Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 04/09/2013
Date Data Arrived at EDR: 04/10/2013
Date Made Active in Reports: 05/14/2013
Number of Days to Update: 34

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 06/13/2013
Next Scheduled EDR Contact: 09/30/2013
Data Release Frequency: Annually

Fuel Leak List
A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 03/18/2013
Date Data Arrived at EDR: 03/19/2013
Date Made Active in Reports: 03/27/2013
Number of Days to Update: 8

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 06/17/2013
Next Scheduled EDR Contact: 09/30/2013
Data Release Frequency: Semi-Annually

SANTA BARBARA COUNTY:

CUPA Facility Listing
CUPA Program Listing from the Environmental Health Services division.

Date of Government Version: 09/08/2011
Date Data Arrived at EDR: 09/09/2011
Date Made Active in Reports: 10/07/2011
Number of Days to Update: 28

Source: Santa Barbara County Public Health Department
Telephone: 805-686-8167
Last EDR Contact: 05/20/2013
Next Scheduled EDR Contact: 06/10/2013
Data Release Frequency: Varies

SANTA CLARA COUNTY:

Cupa Facility List
Cupa facility list

Date of Government Version: 03/04/2013
Date Data Arrived at EDR: 03/05/2013
Date Made Active in Reports: 03/25/2013
Number of Days to Update: 20

Source: Department of Environmental Health
Telephone: 408-918-1973
Last EDR Contact: 06/03/2013
Next Scheduled EDR Contact: 09/16/2013
Data Release Frequency: Varies

HIST LUST - Fuel Leak Site Activity Report
A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22

Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LOP Listing
A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 03/04/2013
Date Data Arrived at EDR: 03/06/2013
Date Made Active in Reports: 03/25/2013
Number of Days to Update: 19

Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 06/03/2013
Next Scheduled EDR Contact: 09/16/2013
Data Release Frequency: Annually

Hazardous Material Facilities
Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 05/16/2013
Date Data Arrived at EDR: 05/17/2013
Date Made Active in Reports: 06/25/2013
Number of Days to Update: 39

Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 05/13/2013
Next Scheduled EDR Contact: 08/26/2013
Data Release Frequency: Annually

SANTA CRUZ COUNTY:

CUPA Facility List
CUPA facility listing.

Date of Government Version: 05/28/2013
Date Data Arrived at EDR: 05/29/2013
Date Made Active in Reports: 06/27/2013
Number of Days to Update: 29

Source: Santa Cruz County Environmental Health
Telephone: 831-464-2761
Last EDR Contact: 05/28/2013
Next Scheduled EDR Contact: 09/09/2013
Data Release Frequency: Varies

SHASTA COUNTY:

CUPA Facility List

Cupa Facility List.

Date of Government Version: 03/15/2013	Source: Shasta County Department of Resource Management
Date Data Arrived at EDR: 03/15/2013	Telephone: 530-225-5789
Date Made Active in Reports: 03/27/2013	Last EDR Contact: 05/28/2013
Number of Days to Update: 12	Next Scheduled EDR Contact: 09/09/2013
	Data Release Frequency: Varies

SOLANO COUNTY:

Leaking Underground Storage Tanks

A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 03/20/2013	Source: Solano County Department of Environmental Management
Date Data Arrived at EDR: 03/28/2013	Telephone: 707-784-6770
Date Made Active in Reports: 05/14/2013	Last EDR Contact: 06/12/2013
Number of Days to Update: 47	Next Scheduled EDR Contact: 09/30/2013
	Data Release Frequency: Quarterly

Underground Storage Tanks

Underground storage tank sites located in Solano county.

Date of Government Version: 03/20/2013	Source: Solano County Department of Environmental Management
Date Data Arrived at EDR: 03/28/2013	Telephone: 707-784-6770
Date Made Active in Reports: 05/13/2013	Last EDR Contact: 06/12/2013
Number of Days to Update: 46	Next Scheduled EDR Contact: 09/30/2013
	Data Release Frequency: Quarterly

SONOMA COUNTY:

Cupa Facility List

Cupa Facility list

Date of Government Version: 04/01/2013	Source: County of Sonoma Fire & Emergency Services Department
Date Data Arrived at EDR: 04/03/2013	Telephone: 707-565-1174
Date Made Active in Reports: 05/14/2013	Last EDR Contact: 06/25/2013
Number of Days to Update: 41	Next Scheduled EDR Contact: 10/14/2013
	Data Release Frequency: Varies

Leaking Underground Storage Tank Sites

A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 04/02/2013	Source: Department of Health Services
Date Data Arrived at EDR: 04/03/2013	Telephone: 707-565-6565
Date Made Active in Reports: 05/14/2013	Last EDR Contact: 06/25/2013
Number of Days to Update: 41	Next Scheduled EDR Contact: 10/14/2013
	Data Release Frequency: Quarterly

SUTTER COUNTY:

Underground Storage Tanks

Underground storage tank sites located in Sutter county.

Date of Government Version: 03/13/2013	Source: Sutter County Department of Agriculture
Date Data Arrived at EDR: 03/14/2013	Telephone: 530-822-7500
Date Made Active in Reports: 03/27/2013	Last EDR Contact: 06/10/2013
Number of Days to Update: 13	Next Scheduled EDR Contact: 09/23/2013
	Data Release Frequency: Semi-Annually

TUOLUMNE COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 01/14/2013
Date Data Arrived at EDR: 01/16/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 42

Source: Divison of Environmental Health
Telephone: 209-533-5633
Last EDR Contact: 05/15/2013
Next Scheduled EDR Contact: 07/29/2013
Data Release Frequency: Varies

VENTURA COUNTY:

Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 04/26/2013
Date Data Arrived at EDR: 05/22/2013
Date Made Active in Reports: 06/25/2013
Number of Days to Update: 34

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 05/20/2013
Next Scheduled EDR Contact: 09/02/2013
Data Release Frequency: Quarterly

Inventory of Illegal Abandoned and Inactive Sites
Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 12/01/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 49

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 07/03/2013
Next Scheduled EDR Contact: 10/21/2013
Data Release Frequency: Annually

Listing of Underground Tank Cleanup Sites
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 02/18/2013
Next Scheduled EDR Contact: 06/03/2013
Data Release Frequency: Quarterly

Medical Waste Program List
To protect public health and safety and the environment from potential exposure to disease causing agents, the Environmental Health Division Medical Waste Program regulates the generation, handling, storage, treatment and disposal of medical waste throughout the County.

Date of Government Version: 01/28/2013
Date Data Arrived at EDR: 02/01/2013
Date Made Active in Reports: 03/20/2013
Number of Days to Update: 47

Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 06/11/2013
Next Scheduled EDR Contact: 08/12/2013
Data Release Frequency: Quarterly

Underground Tank Closed Sites List
Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 03/01/2013
Date Data Arrived at EDR: 03/28/2013
Date Made Active in Reports: 05/13/2013
Number of Days to Update: 46

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 06/12/2013
Next Scheduled EDR Contact: 09/30/2013
Data Release Frequency: Quarterly

YOLO COUNTY:

Underground Storage Tank Comprehensive Facility Report
Underground storage tank sites located in Yolo county.

Date of Government Version: 03/25/2013
Date Data Arrived at EDR: 03/29/2013
Date Made Active in Reports: 05/13/2013
Number of Days to Update: 45

Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 06/07/2013
Next Scheduled EDR Contact: 10/07/2013
Data Release Frequency: Annually

YUBA COUNTY:

CUPA Facility List
CUPA facility listing for Yuba County.

Date of Government Version: 05/24/2013
Date Data Arrived at EDR: 05/24/2013
Date Made Active in Reports: 06/27/2013
Number of Days to Update: 34

Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 05/20/2013
Next Scheduled EDR Contact: 08/19/2013
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data
Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 05/20/2013
Date Data Arrived at EDR: 05/21/2013
Date Made Active in Reports: 06/27/2013
Number of Days to Update: 37

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 05/21/2013
Next Scheduled EDR Contact: 09/02/2013
Data Release Frequency: Annually

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/19/2012
Date Made Active in Reports: 08/28/2012
Number of Days to Update: 40

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 04/19/2013
Next Scheduled EDR Contact: 07/29/2013
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 05/01/2013
Date Data Arrived at EDR: 05/09/2013
Date Made Active in Reports: 07/10/2013
Number of Days to Update: 62

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 05/09/2013
Next Scheduled EDR Contact: 08/19/2013
Data Release Frequency: Annually

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/23/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 57

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 04/23/2013
Next Scheduled EDR Contact: 08/05/2013
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 06/22/2012
Date Made Active in Reports: 07/31/2012
Number of Days to Update: 39

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 05/28/2013
Next Scheduled EDR Contact: 09/09/2013
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/19/2012
Date Made Active in Reports: 09/27/2012
Number of Days to Update: 70

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 06/28/2013
Next Scheduled EDR Contact: 09/30/2013
Data Release Frequency: Annually

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

STREET AND ADDRESS INFORMATION

EDR DataMap® - Area Study

EDR® Environmental Data Resources Inc

Keeler Dunes Dust Control Project

Keeler, CA

- Listed Sites
- Earthquake Epicenters (Richter 5 or greater)
- Search Boundary
- Roads
- Major Roads
- Waterways
- Railroads
- Contour Lines
- Pipelines
- Powerlines
- Fault Lines
- Water
- Superfund Sites
- Federal DOD Sites
- Indian Reservations BIA
- 100-Yr Flood Zones
- National Wetland Inventory

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0 1/4 1/2

Scale in Miles

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APPENDIX H
TRAFFIC IMPACT STUDY

LINSCOTT
LAW &
GREENSPAN
engineers

TRAFFIC IMPACT STUDY

KEELER DUNES DUST MITIGATION PROJECT

Keeler, California
March 19, 2014

Prepared for:

Sapphos Environmental, Inc.
430 North Halstead Street
Pasadena, California 91107

LLG Ref. 1-07-3688-3

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STATE OF CALIFORNIA

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TABLE OF CONTENTS

SECTION PAGE

TABLE OF CONTENTS *(continued)*

SECTION PAGE

TABLE OF CONTENTS *(continued)*

SECTION—FIGURE #		PAGE

LIST OF TABLES

SECTION—TABLE #		PAGE

APPENDICES

APPENDIX	

TRAFFIC IMPACT STUDY

KEELER DUNES DUST MITIGATION PROJECT

Keeler, California
March 19, 2014

1.0 INTRODUCTION

This traffic analysis has been prepared to identify and evaluate the potential transportation impacts associated with implementation of the proposed Keeler Dunes Dust Mitigation project for Owens Lake in Inyo County, California. The proposed Keeler Dunes Dust Mitigation project involves establishment of native vegetation cover coupled with straw bales as a temporary wind barrier to control fugitive dust emissions in the Keeler Dunes and to meet ambient air quality standards. The goal of the proposed project is stabilize the Keeler Dunes such that high wind events will not result in fugitive dust emissions that exceed the federal and state standards within the communities of Keeler and Swansea. The proposed project is anticipated to be constructed within approximately one year with periodic maintenance and monitoring for three years.

The proposed project is located immediately north-northwest of the community of Keeler, California, and east of the 110-square-mile (70,000-acre) dry Owens Lake bed, located within the Owens Valley, Inyo County, California. The proposed project area and regional vicinity are shown in ***Figure 1-1***. The proposed project is located approximately 65 miles southeast of the City of Bishop. The proposed project is located approximately 10 miles to the west of Death Valley National Park, approximately 11 miles to the east of Sequoia National Park, and approximately 48 miles north of the City of Ridgecrest. There are two communities in the vicinity of the proposed project located in the unincorporated area of Inyo County (the community of Keeler southeast and adjacent to the proposed project and the community of Swansea to the north). The Keeler Dunes project site and local vicinity are shown in ***Figure 1-2***. One designated Native American reservation, the Lone Pine Paiute-Shoshone Indian Reservation, is located approximately 10 miles to the northwest. The proposed project is located in Sections 30, 31, and 32, Township 16 South, Range 37 East; and Sections 24, 25, and 36, Township 16 South, Range 38 East, Mount Diablo Baseline and Meridian, California.

This traffic evaluation is being included as part of the proposed Keeler Dunes Dust Mitigation project and the corresponding Environmental Impact Report/Environmental Assessment (EIR/EA). The evaluation has been prepared in accordance with the California Environmental Quality Act (CEQA), as amended, and the Guidelines for Implementation of the California Environmental Quality Act (State CEQA Guidelines). This analysis is intended to describe the potential impacts of the proposed project and provide recommendations for mitigation requirements in the vicinity of the project within the context of existing traffic conditions as well as under future with project traffic conditions. Level of Service (LOS) C or better has been identified as satisfactory traffic operation conditions for roadway segments in the project vicinity. LOS is a letter scheme (A through F) used to describe traffic conditions for an existing or proposed roadway or intersection operating under current or projected traffic demand. Further discussion of the LOS concept and LOS C is provided in Subsection 6.1 herein.

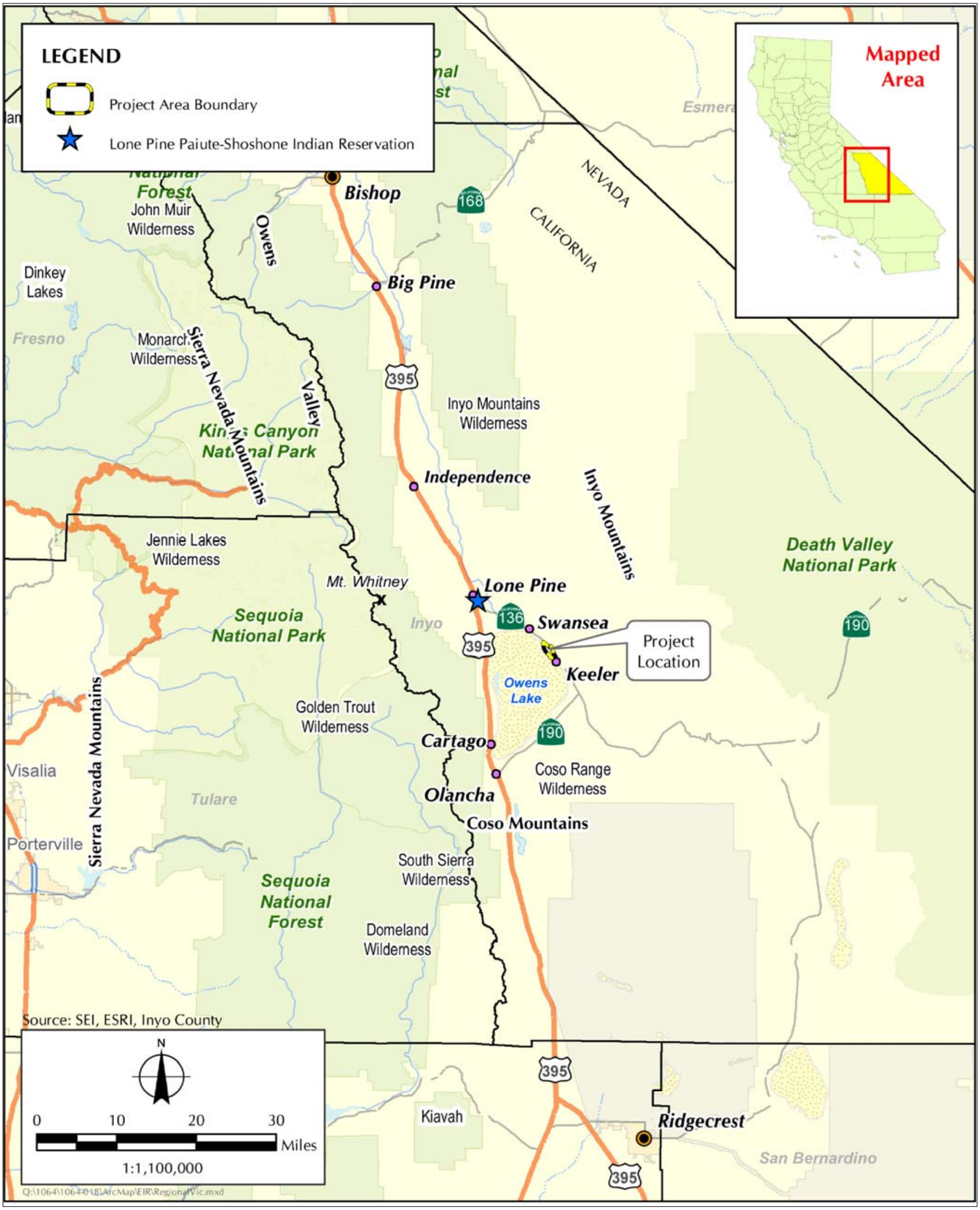

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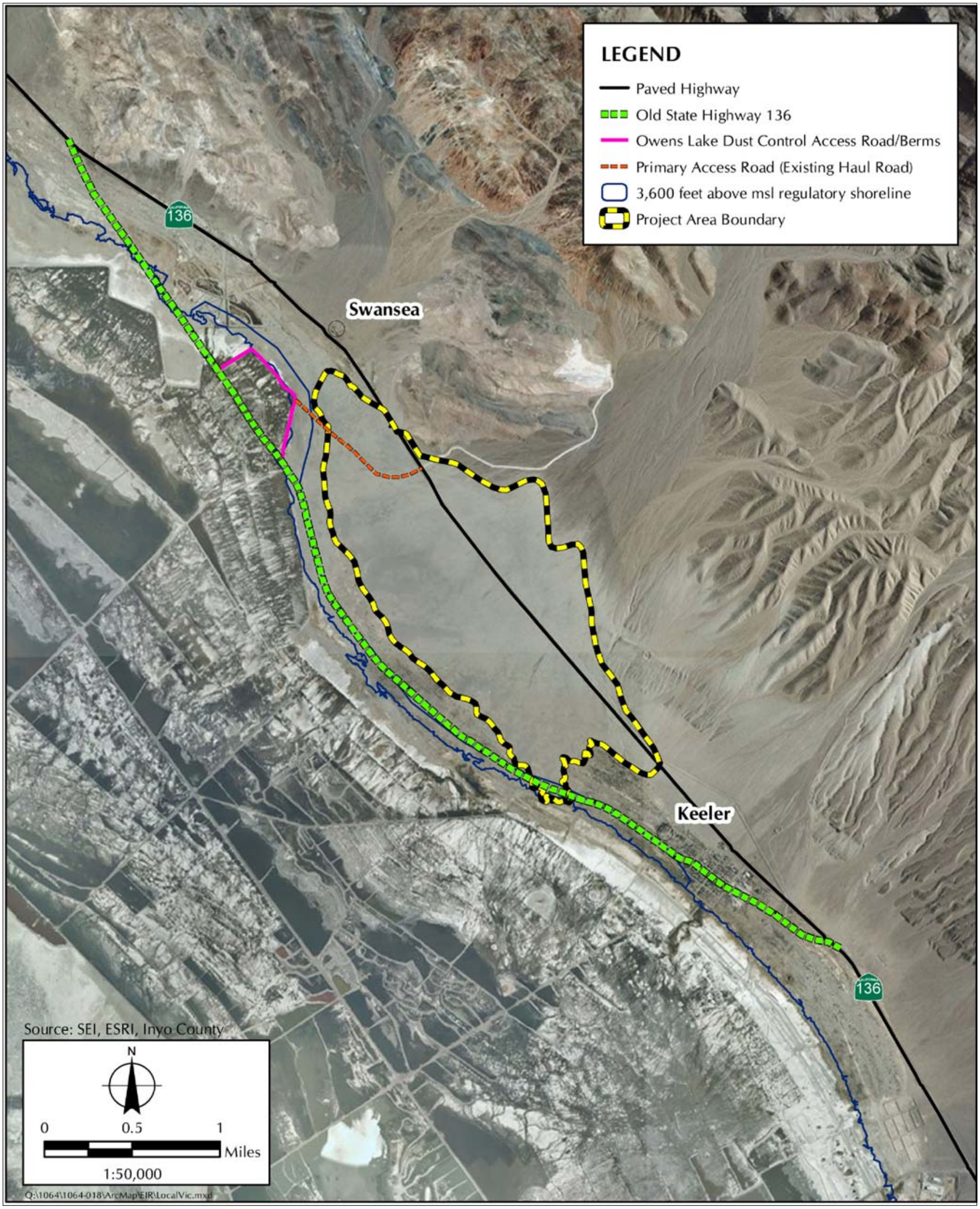
FIGURE 1-1
REGIONAL VICINITY MAP

LINSCOTT, LAW & GREENSPAN, engineers

KEELER DUNES DUST MITIGATION PROJECT



MAP SOURCE: SAPPHOS ENVIRONMENTAL, INC.

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FIGURE 1-2
PROJECT STUDY AREA

LINSCOTT, LAW & GREENSPAN, engineers

KEELER DUNES DUST MITIGATION PROJECT

2.0 PROJECT DESCRIPTION[1]

Consistent with the requirements of §15124 of the State of California Environmental Quality Act Guidelines (State CEQA Guidelines), the project description of the Keeler Dunes Dust Mitigation Project (proposed project) includes the precise location and boundaries of the proposed project; a brief characterization of the existing conditions at the proposed project site; a statement of objectives for the proposed project; a general delineation of the proposed project's technical, economic, and environmental characteristics; and a statement describing the intended uses of the EIR/EA.

2.1 Proposed Project Location

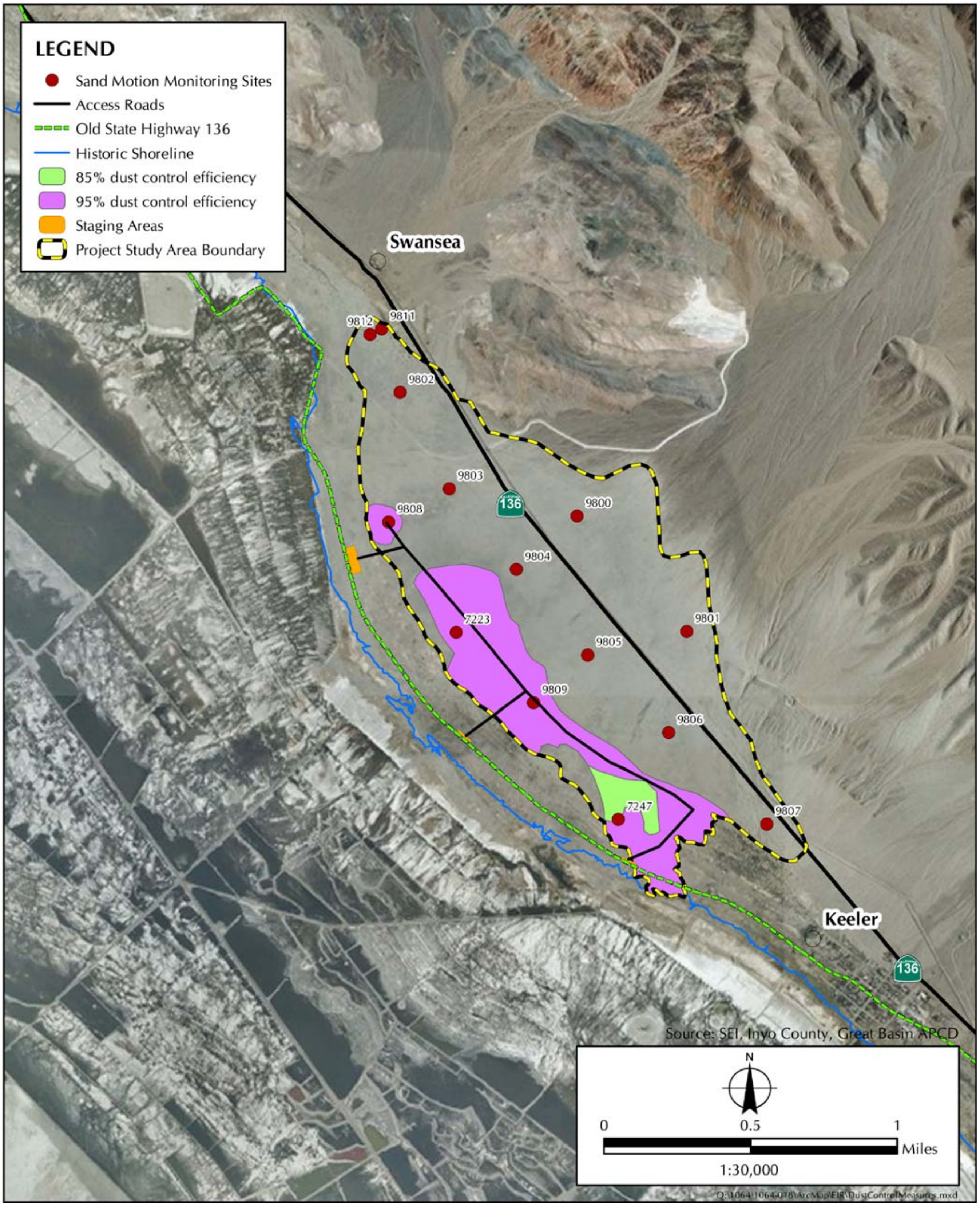
The proposed project is located immediately north-northwest of the community of Keeler, California, and east of the 110-square-mile (70,000 acres) dry Owens Lake bed, located within the Owens Valley, Inyo County, California. The proposed project is located approximately 10 miles southeast of the community of Lone Pine and approximately 65 miles southeast of the City of Bishop. The proposed project is located approximately 10 miles to the west of Death Valley National Park, approximately 11 miles to the east of Sequoia National Park, and approximately 48 miles north of the City of Ridgecrest. There are two communities in the vicinity of the proposed project located in the unincorporated area of Inyo County (the community of Keeler southeast and adjacent to the proposed project, the community of Swansea to the north) and one designated Native American reservation (Lone Pine Paiute-Shoshone Indian Reservation 10 miles to the northwest). The Keeler Dunes proposed dust control project is located within the Owens Valley Planning Area (OVPA). The OVPA is situated in the southern end of the Owens Valley and implementation of various dust control measures on the former bed of Owens Lake has been ongoing since the year 2000.

The proposed project is approximately 194 acres in size and is located within a 1.3 square mile project study area. The project study area is located on the Keeler alluvial fan situated between the base of the Inyo Mountains to the east-northeast and the dried bed of Owens Lake to the west-southwest. The project study area extends approximately 2.5 miles to the northwest from the community of Keeler and is dissected by SR 136. The proposed project is located on lands administered by the U.S. Department of Interior Bureau of Land Management Bishop Office (BLM) and the City of Los Angeles Department of Water and Power (LADWP). The proposed project dust control measure location map is presented in ***Figure 2-1***.

2.2 Project Purpose and Need

The Great Basin Unified Air Pollution Control District (District) regulates fugitive dust (PM_{10}) emissions in the Owens Valley Planning Area consistent with the requirements of the National Ambient Air Quality Standards (NAAQS). The dried Owens Lake bed has been the largest single source of PM_{10} emissions in the United States for many years, with annual PM_{10} emissions of more than 80,000 tons and 24-hour concentrations as high as 130 times the federal air quality standard. The air pollution at Owens Lake is caused by the City of Los Angeles's diversion of

[1] Source for Project Description: Sapphos Environmental, Inc.



MAP SOURCE: SAPPHOS ENVIRONMENTAL, INC.

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FIGURE 2-1
DUST CONTROL MEASURE LOCATION MAP

LINSCOTT, LAW & GREENSPAN, engineers

KEELER DUNES DUST MITIGATION PROJECT

water from the Owens River and other streams that once flowed into Owens Lake. These waters have historically been diverted from the Owens Valley to the City of Los Angeles via the Los Angeles Aqueduct. By the 1920s, all that remained of the lake was a 26-square-mile hyper-saline brine pool, and by 1930, Owens Lake was virtually dry.[2]

Exposed dry lake bed sediments have been dispersed into the air by prevailing winds over the past nearly 100 years. The resulting severe dust storms occur primarily during October through June with the highest frequency of dust events occurring March through May and also in December. The northeastern portion of the Owens Lake bed, an area termed the North Sand Sheet (NSS), was one of the largest dust source areas. The NSS soil composition is primarily made up of sediment from the Owens River, with a smaller portion from the Inyo Mountains east of the lake. Exposure of the NSS to high winds following desiccation of Owens Lake resulted in movement of the lake bed sediments to the southeast, forming a deposit of aeolian material on the adjacent alluvial fan (Keeler Fan).[3] Over time, wind reworked the Keeler Dunes sand deposits, which currently extend over an approximately 1.3-square-mile area. The Keeler Dunes appear to be spreading to the east and southeast toward the community of Keeler and the foothills of the Inyo Mountains.

The material from Keeler Dunes becomes mobile during high-wind events and, since dust sources on the bed of Owens Lake are largely controlled, are one of the last main dust sources that contribute to exceedances of the state and federal 24-hour PM_{10} standard in the community of Keeler. As a result of data collected from sand-motion monitoring since April 2000, the District has identified the Keeler Dunes as one of the areas that need to be controlled to attain the NAAQS for PM_{10} within the Owens Valley Planning Area. The Keeler Dunes continue to cause an average of six PM_{10} standard exceedances every year since 1993. These standard exceedances threaten the health, property and environment of the residents of the Keeler/Swansea area. The airborne particulate matter from dust events can be inhaled deeply by humans and may result in serious respiratory ailments. In addition to the 66 residents of the community of Keeler, the District estimates that approximately 40,000 permanent residents that live in the area in addition to the visitors are affected by particulate emissions originating from Owens Lake.

The proposed project, in combination with other on-going dust control projects that have been and are being implemented on the lake bed by the LADWP, is designed to improve air quality through the reduction of PM_{10} emissions throughout the Owens Valley Planning Area but particularly in the community of Keeler. Dust control measures are necessary at the Keeler Dunes to bring the community of Keeler and greater Owens Lake area into compliance with the NAAQS for PM_{10} by 2017.

[2] Great Basin Air Pollution Control District. January 2008. *2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan – Final Subsequent Environmental Report*. Prepared by: Sapphos Environmental, Inc., Pasadena, CA.

[3] Lancaster, N., March 2012. Development of the Keeler Dunefield, Inyo County, California, Part 1 – Analysis of Aerial Photographs and Satellite Imagery. Prepared by DRI for GBUAPCD.

2.3 Project Background

The District has been conducting ongoing air monitoring in the Keeler dunes area since 2000 with the installation of two sand motion monitoring sites. In response to commitments made by the District in its 2006 Settlement Agreement with the LADWP and the 2008 Owens Valley PM_{10} State Implementation Plan (2008 SIP), an additional twelve sand monitor sites were added in 2010 for the purpose of establishing a monitoring program to gather information on the location and magnitude of dust emissions in the dunes and with the goal of developing a strategy for PM_{10} emission control. The 2008 SIP required control of the dust emissions from the Keeler Dunes on or before December 31, 2013 in order to demonstrate attainment of the federal standard within the Owens Valley Planning Area by 2017.[4] The District is responsible for developing a dust control strategy and plan for the Keeler Dunes PM_{10} emissions.

2.4 Existing Conditions

The existing conditions section provides a description of the physical environmental conditions in the vicinity of the proposed project site as they existed at the time of the Notice of Preparation of the EIR/EA from both a local and regional perspective (State CEQA Guidelines, Section 15125). This section constitutes the baseline physical conditions by which the District will determine if an impact is significant or not.

2.4.1 *Regional Environmental Setting*

The climate of the Owens Valley is semiarid to arid and is characterized by low precipitation, abundant sunshine, frequent winds, moderate to low humidity, and high potential evapotranspiration. The Sierra Nevada Mountains, trending north to south, west of the proposed project greatly influence the climate. Although a rain shadow is present east of the crest of the range, the Owens Valley floor and on the Inyo, White Mountains, and Coso Range receive appreciably less precipitation, ranging from 7 to 14 inches per year in the Inyo and White Mountains to approximately 5 in/year on the valley floor[5]. Air temperatures can range greatly from -2 degrees Fahrenheit (F) in the winter to 107 degrees F in the summer and can also range widely during a single day spanning more than 50 degrees F[6].

There are two communities in the vicinity of the project located in the unincorporated area of Inyo County (the community of Swansea to the north and the community of Keeler to the southeast). Existing regional activities include agricultural cattle grazing; mining; recreation, including hiking and bird-watching; water supply transfers; and on-going air quality monitoring

---

[4] Great Basin Unified Air Pollution Control District, 2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan, GBUAPCD, Bishop, California, 28 January 2008.

[5] Hollett, K.J., Danskin, W.R., McCaffrey, W.F., and Walti, C.L., 1991, Geology and water resources of Owens Valley, California: U.S. Geological Survey Water-Supply Paper 2370-B. Available at: http://onlinepubs.er.usgs.gov/djvu/WSP/wsp_2370-B.djvu

[6] Danskin, W.R. 1998. Evaluation of the Hydrologic System and Selected Water-Management Alternatives in the Owens Valley, California. U.S. Geological Survey Water-Supply Paper 2370. Prepared in cooperation with the Inyo County and the Los Angeles Department of Water and Power.

associated with the ongoing dust control activities that are a part of the 2008 SIP for controlling dust emissions from the Owens Lake bed.

2.4.2 *Local Environmental Setting*

The project study area is situated on the western portion of the Keeler alluvial fan that slopes from the Inyo Mountains on the east to the bed of Owens Lake on the west. The topographic relief of the project study area is 275 feet and extends from approximately 3,605 feet above mean sea level (MSL) near the historic shore of Owens Lake to approximately 3,880 feet above MSL on the alluvial fan. The location of the proposed project is depicted on USGS 7.5-minute series topographic quadrangles Owens Lake[7] and Dolomite[8].

The proposed project area is characterized by primarily two plant communities dominated by two populations: Parry's saltbush *(Atriplex parryi)* and greasewood *(Sarcobatus vermiculatus)*. The majority of the project area is dominated by open dry areas with little or no vegetation present.

2.4.3 *Existing Dust Control Areas at Owens Lake*

The proposed project is located adjacent to the Owens Lake bed where dust control measures (DCMs) have been implemented and are ongoing to control particulate emissions resulting from the desiccation of the Owens Lake due to City of Los Angeles water diversions. As of December 2012, 42 square miles of dust control will be implemented[9].

2.5 Statement of Project Goals and Objectives

2.5.1 *Project Goals*

The primary goal of the proposed project is to implement controls to reduce the elevated levels of windblown dust from the Keeler Dunes that are causing and contributing to exceedances of the NAAQS and California State standard for PM_{10} by 2014 in order to meet the March 2017 OVPA Area Revised 2008 State Implementation Plan attainment date. In addition, the proposed project must be consistent with the Department of Interior Bureau of Land Management Resource Management Plan.

The District's goal for control of dust emissions is to utilize measures that reduce PM_{10} exceedances while minimizing impacts to natural and cultural resources located within the Keeler Dunes. The dust control strategy includes establishment and management of native vegetation, and use of straw bales as temporary wind breaks in selected areas. The ultimate goal of the project is to develop a strategy that not only controls dust emissions from the Keeler Dunes but also creates a natural landscape that is self-sustaining and can be operated and maintained with minimal resources.

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[7] U.S. Geological Survey. 1987. 7.5-Minute Series Owens Lake, California, Topographic Quadrangle. Denver, CO.
[8] U.S. Geological Survey. 1987. 7.5-Minute Series Dolomite, California, Topographic Quadrangle. Denver, CO.
[9] The 42 mi^2 dust control area includes the 2.0 mi^2 Phase 8 Gravel and the 0.6 mi^2 sand fence area in T1A-1.

2.5.2 *Project Objectives*

The Owens Valley Planning Area Revised 2008 State Implementation Plan requires attainment of the NAAQS 24-hour PM_{10} standard by March 2017. Additionally, the District has a policy to achieve the California State PM_{10} standard within the District communities. The District and BLM identified and prioritized five basic objectives that are important to achieving the proposed project goals:

- Reduce the levels of windblown dust that are causing and contributing to exceedances of the NAAQS and California State standard for PM_{10} air pollution.
- Attain the NAAQS and State PM_{10} standards in the communities of Keeler and Swansea
- Minimize impacts to natural and cultural resources
- Create a landscape that mimics comparable natural environments
- Is self-sustaining and can be operated with minimal resources

2.6 Proposed Project Description

The proposed project is a program to stabilize a portion of the Keeler sand dunes and associated sand deposits and reduce dust emissions that are causing and contributing to exceedances of the NAAQS and California State Standard for PM_{10} in the Owens Valley Planning Area. The basis of any effective dust control strategy must be a program to stabilize the Keeler Dunes such that high wind events will not result in fugitive dust emissions that exceed the federal and state standards within the local communities. The District has determined, based on stakeholder input, that the most effective method to control fugitive dust emissions in the Keeler Dunes and to meet ambient air quality standards involves establishment of a native vegetation cover coupled with straw bales as a temporary wind barrier.

2.6.1 *Project Elements*

Elements of the proposed project include planting and establishment of native vegetation and placement of straw bales as a temporary wind break.

Dust Control Measures

Native Vegetation

This dust control measure involves the establishment of a mix of native vegetation within the areas. The goal would be to create a natural vegetated dune environment that mimics comparable natural environments such as the existing Swansea Dunes (located to the northeast) and other stable shoreline dunes in the region (Mono Lake). The establishment of native vegetation would act to prevent high emissions of dust by breaking up the wind and lowering the wind speed at the surface. Approximate spacing of plants necessary to achieve an estimated 85 and 95 percent dust control efficiency is summarized in ***Table 2-1***, Dust Control Measure Elements for Keeler Dunes Project.

TABLE 2-1

DUST CONTROL MEASURE ELEMENTS FOR KEELER DUNES PROJECT

Element	Minimum Control Efficiency	No. of Acres	No. Required per Acre	Total No. Required
Native Plants	95 percent	177	1,983	350,991[9]
Native Plants	85 percent	17	1,092	18,564
Total Plants				369,555
Straw Bales[10]	95 percent	177	661	116,997
Straw Bales	85 percent	17	364	6,188
Total Straw Bales				123,185

Atriplex polycarpa (ATPO) (two-thirds) and a mixture of other types of native vegetation (one-third) will be planted. ATPO was selected for its physiological characteristics, in addition to seed availability, low water needs, relatively rapid growth and adaptation to the regional area.[11] A list of native vegetation that will be considered for planting at the dunes in addition to the ATPO is shown in ***Table 2-2***, Native Vegetation List for Keeler Dunes Dust Control Project.

TABLE 2-2

NATIVE VEGETATION LIST FOR KEELER DUNES DUST MITIGATION PROJECT

Scientific Name	Common Name
Atriplex polycarpa (ATPO)	Cattle spinach, cattle saltbush
Atriplex confertifolia (ATCO)	Shadscale saltbush
Atriplex parryi (ATPA)	Parry’s saltbush
Atriplex phyllostegia (ATPH)	Arrowscale

[10] The dimensions of the straw bales are 0.6 x 0.4 x 1.17 meter.
[11] HydroBio Advanced Remote Sensing. 2011. Report to Great Basin Unified Air Pollution Control District, Stabilizing Keeler Dunes Rapidly Using Native Vegetation and Minimal Inputs. October 2011

Cleomella obtusifolia (CLOB)	Mojave stinkweed, Mojave cleomella
Cleome sparsifolia (CLSP)	Fewleaf cleome, fewleaf spiderflower
Psathyrotes ramoissima (PSRA)	turtleback
Sarcobatus vermiculatus (SAVE)	greasewood
Suaeda moquinii (SUMO)	Inkweed, Mojave seablite

Native plants will be cultivated in a nursery and will be approximately 15 centimeters in height. Planting will involve initial placement of a straw bale (see additional project elements below) followed by installation of three native plants at the base of the straw bale. In addition, seeds of native plants will be dispersed in open areas between the straw bales.

Periodic watering of the plants is conservatively included in the project description once per year for up to three (3) years following the initial planting. It is anticipated that supplemental watering, if needed, would occur in March when the plants are breaking dormancy for the year. The long-term goal of this DCM would be the establishment of a self-sustaining native vegetation cover to control dust with minimal long-term maintenance. Continued air monitoring would be required and minimal long-term maintenance would be anticipated with this DCM.

Straw Bales

This is a temporary element of the dust control measure that would be used to stabilize emissive dust areas and provide a sheltered environment for plants during establishment. The proposed project will utilize straw bales installed in an irregular pattern across the emissive areas. *Table 2-1*, Dust Control Measure Elements, provides the number of straw bales necessary for 85 and 95 percent dust control. Straw bales are anticipated to degrade over a period of several years and would provide organic material to the existing soil. Limited maintenance of straw bales (replacement of broken bales) is anticipated.

Other Project Elements

Other project elements include infrastructure elements that may consist of access roads, staging areas, water supply, conveyance and water distribution facilities, and an effectiveness monitoring program.

Staging Areas

Temporary staging areas will be established to provide contractor(s) with storage and placement of equipment and straw bales, native plants, a temporary water storage tank and supplies. Staging area(s) will be located on land near the dust control areas. Several staging areas are currently proposed and are illustrated on *Figure 2-1*. The total area of the proposed staging areas is approximately three (3) acres.

One main staging area (Staging Area 1) will be established within the northwestern edge of the project area on land administered by the BLM. Located immediately east of Old State Highway 136, the facility will measure 200 feet by 500 feet in area and will be used by the contractor(s) for the storage of equipment, fuel, all-terrain vehicles (ATVs), wind barrier materials, native plants, and other supplies. It is also anticipated that the area will serve as an employee parking lot.

Staging Area 2 and Staging Area 3 will also be constructed for the proposed project along the Old State Highway 136, on land managed by BLM and LADWP, respectively. These areas is will be used for the temporary storage of equipment and materials needed for dust control measures in the central and southern portions of the project area.

Access Roads

A temporary access road for ATV travel will be constructed for use during placement of straw bales, planting and watering activities. The temporary access road will provide connectivity between the staging areas located adjacent to Old State Highway 136 and the project study area. The temporary access road will be constructed with minimal grading and flattening/removal of vegetation. No supplemental materials such as asphalt or gravel will be used. Following completion of planting and watering activities, the temporary access road will be restored utilizing straw bales and native plants for the dust control areas of the project. The temporary access road from the staging areas will be approximately 11,355 feet long (2.2 miles), ten (10) feet wide and even with the existing grade (total road area is 2.6 acres). The approximate location of access roads is shown in *Figure 2-1*.

All project-related vehicles including haul trucks, service/delivery vehicles, and employees shall utilize the existing gravel haul road at SR 136 for all access. This is an existing intersection which was used by trucks and workers for the ongoing Phase 8 of the Owens Lake dust control project. The existing gravel haul road/SR 136 intersection forms a four-way intersection with appropriate advance signage including intersection (W2-1) and truck (W11-10) signs. Further, the use of the existing gravel haul road to access the project study area would limit the number of project-related trips through the community of Keeler.

Water Supply, Conveyance, and Distribution

Approximately five (5) gallons of water will be applied under each straw bale prior to planting the ATPO. Total water needs for the ATPO are expected to be approximately two (2) acre-feet. It is expected that supplemental watering will be implemented when rainfall is less than forty (40) percent of the average annual rainfall during the first three (3) years until plants are well-established. It is assumed that up to 1.9 acre-feet of water would be applied annually during this time period. The total water demand for the proposed project is estimated at up to 7.6 acre-feet (2.6 million gallons) over a four year period.

The proposed project assumes that the water for plant irrigation will be supplied from the Fault Test Site, an existing well site located about 1.5 miles northwest of the proposed project area. Other available water sources include purchased water from the Keeler Community Services District Well or the Agrarian Wells. Water will be transported to the project via water trucks, and transferred to a water storage tank located near the project area. Subsequent distribution to individual plants in the project would be conducted through hoses from smaller water tanks transported via the access to the dust control areas.

Effectiveness Monitoring Program

The District is currently monitoring dust activity in the project area with a network of 16 sand motion monitoring sites. The monitoring program will continue to operate during and after DCM implementation. Review of dust control measure effectiveness will be completed one time per year.

2.6.2 *Construction Scenario*

Installation of the proposed project would require approximately 11 months to complete from August 2014 through June 2015. Construction of the proposed project would be divided into the following parts: (1) temporary access road and staging area(s), (2) bale placement and planting and watering, (3) project oversight and monitoring, and (4) supplemental watering and planting as required.

Site preparation of the staging area for plants and equipment and minimal grading and vegetation removal for temporary access roads would be required for project implementation. Construction of the project will require a temporary disturbance of 5.6 acres. Fugitive dust emissions shall be controlled and minimized, to comply with Great Basin Unified Air Pollution Control District Rules 400 and 401 through the application of best available control measures during project implementation. ATV's will be restricted to travel at less than 5 miles per hour to minimize dust levels. Restoration of disturbed areas, such as staging areas and temporary access road, would occur at the end of 3 years or when the plants were established enough such that they did not need any supplemental watering. Supporting activities would include material delivery, planting, placement of straw bales, water delivery to plants, on-going air monitoring, and transportation of work crews. Site preparation and construction of the proposed project would be undertaken in accordance with all federal, state, and County of Inyo building codes.

A maximum of 72 workers would be expected to be on site during peak construction activity periods. Construction equipment would be turned off when not in use. The construction contractor would be required to ensure that all equipment is properly maintained. All vehicles would utilize exhaust mufflers and engine enclosure covers (as designed by the manufacturer) at all times.

The plans and specifications for the proposed project would include the requirements for construction equipment and average number of hours of operation of the type specified in ***Table 2-3***, Dust Control Activity, Duration, Equipment, and Workers. *Table 2-3* lists the duration of each activity and maximum number of workers on the site each day.

TABLE 2-3

DUST CONTROL ACTIVITY, DURATION, EQUIPMENT, AND WORKERS

Activity	Duration (months)	Equipment	Workers (maximum)
Site preparation	~ 1 week	GrubberAll-terrain vehicle Pickup truck Trailers	10
Deliver and distribute straw bales over the dust control areas	6 to 8 months	Semi-trucks with tandem trailers Loader with forks Hay Squeeze All-terrain vehicles	72
Planting and watering	6 to 8 months	All-terrain vehicles Loader with forks Water trucks	72
Cleanup/restoration	~ 2 weeks	Semi-trucks with tandem trailers All-terrain vehicles Loader with forks Dozers and trailers Water trucks Pick-up trucks	20
Supplemental Watering	1 to 3 months	All-terrain vehicles Water Trucks	13

Site ingress and egress for construction, delivery vehicles, haul routes, and emergency response and evacuation would be located at Staging Area 1 along Old State Highway 136 (refer to *Figure 2-1*). Vehicles would return to SR 136 via the existing gravel haul road.

Once the project elements are in place, the site would be monitored for a period of 3 years to evaluate the vegetation growth progress, assess plant mortality and predation, provide water as needed, check the physical condition of straw bales, replace plants that do not survive and supplement native vegetation in accordance with air monitoring data. Review of DCM effectiveness will be completed one time per year and will be reported with recommendations, as appropriate, for adding supplemental plants and/or straw bales as needed to achieve the NAAQS for PM_{10}.

3.0 EXISTING ROADWAY SYSTEM

The roadway network in the vicinity of the Owens Lake includes U.S. Highway 395, SR 136 and SR 190. It should be noted that there are several unimproved roads that provide access to the Owens Lake playa, including the existing improved gravel haul road which is located approximately 10 miles southeast from U.S. Highway 395 (i.e., roughly half-way between U.S. Highway 395 and SR 190). The existing lane configurations on U.S. Highway 395, SR 136 and SR 190, and at the intersections of these roadways are displayed in ***Figure 3-1***. A description of these roadways is provided in the following subsections.

3.1 Roadway Classifications

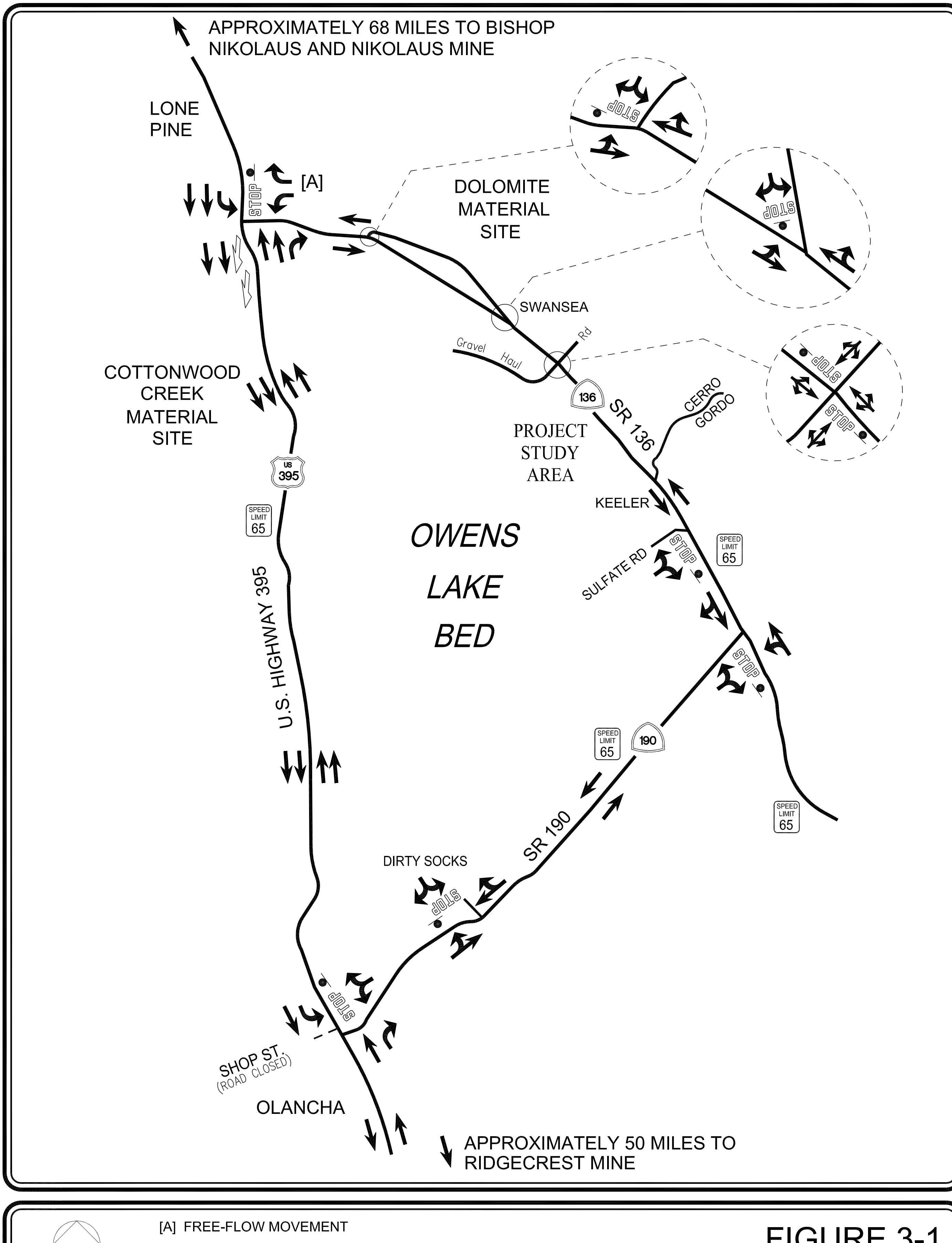
The following roadway categories are recognized by regional, state and federal transportation agencies. There are four categories in the roadway hierarchy, ranging from freeways with the highest capacity to two-lane undivided roadways with the lowest capacity. The roadway categories are summarized as follows:

- *Freeways* are limited-access and high speed travel ways included in the state and federal highway systems. Their purpose is to carry regional through-traffic. Access is provided by interchanges with typical spacing of one mile or greater. No local access is provided to adjacent land uses.

- *Arterial* roadways are major streets that primarily serve through-traffic and provide access to abutting properties as a secondary function. Arterials are generally designed with two to six travel lanes and their major intersections are signalized. This roadway type is divided into two categories: principal and minor arterials. Principal arterials are typically four-or-more lane roadways and serve both local and regional through-traffic. Minor arterials are typically two-to-four lane streets that service local and commute traffic. U.S. Highway 395 falls into the Rural Principal Arterial category and extends from the Mojave Desert near Hesperia on the south to the Canadian border near Laurier where the roadway becomes Highway 395 upon entering British Columbia to the north.

- *Collector* roadways are streets that provide access and traffic circulation within residential and non-residential (e.g., commercial and industrial) areas. Collector roadways connect local streets to arterials and are typically designed with two through travel lanes (i.e., one through travel lane in each direction) that may accommodate on-street parking. They may also provide access to abutting properties.

- *Local* roadways distribute traffic within a neighborhood, or similar adjacent neighborhoods, and are not intended for use as a through-street or a link between higher capacity facilities such as collector or arterial roadways. Local streets are fronted by residential uses and do not typically serve commercial uses.



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[A] FREE-FLOW MOVEMENT

FIGURE 3-1
EXISTING ROADWAY CONFIGURATIONS

LINSCOTT, LAW & GREENSPAN, engineers

KEELER DUNES DUST MITIGATION PROJECT

3.2 Roadway Descriptions

A brief description of the important roadways in the project site vicinity is provided in the following subsections.

3.2.1 *U.S. Highway 395*

U.S. Highway 395 is the main transportation route through Inyo County. U.S. Highway 395 is included on the Inter-Regional Road System and is functionally classified as a Rural Principal Arterial. The highway connects the project area with Mono County and Reno to the north and with the southern California metropolitan area to the south.

Adjacent to Owens Lake, the majority of U.S. Highway 395 is a divided four lane expressway with a posted speed limit of 65 miles per hour. U.S. Highway 395 is a major highway used by commercial traffic traveling within the Owens Valley and by recreational traffic traveling between Death Valley and the Sierra Nevada Mountain Range. From just south of State Route 136 to Cartago U.S. Highway 395 is a four-lane divided highway, where it transitions to a two-lane highway.

At the U.S. Highway 395 intersection with SR 136, one exclusive left-turn lane and two through lanes are provided at the southbound approach on U.S. Highway 395, and two through lanes and a channelized right-turn only lane are provided at the northbound approach on U.S. Highway 395. A southbound departure acceleration lane is also provided for the westbound left-turn movement from SR 136 to southbound on U.S. Highway 395. Twelve foot wide lanes with paved shoulders are provided in each direction on U.S. Highway 395 near the SR 136 intersection and in the project vicinity. The posted speed limit along U.S. Highway 395 at SR 136 varies from 55 miles per hour south of the intersection to 45 miles per hour north of the intersection.

At the U.S. Highway 395 intersection with SR 190, one exclusive left-turn lane and one through lane are provided at the southbound approach on U.S. Highway 395, and one through lane and one channelized right-turn only lane are provided at the northbound approach on U.S. Highway 395. A southbound departure acceleration lane is also provided for the westbound left-turn movement from SR 190 to southbound on U.S. Highway 395. Twelve foot wide lanes with paved shoulders are provided in each direction on U.S. Highway 395 near the SR 190 intersection and in the project vicinity. The posted speed limit along U.S. Highway 395 at SR 190 is 55 miles per hour just north of the intersection.

It is noted that the two-lane portion (i.e., one lane in each direction) of U.S. Highway 395 near Cartago/Olancha is planned to be improved to four lanes.[12] Caltrans plans to convert approximately 12.6 miles of the existing U.S. Highway 395 from a two-lane conventional highway into a four-lane expressway or partial conventional four-lane highway from post mile

[12] *Olancha/Cartago Four-Lane Project, Initial Study with Proposed Mitigated Negative Declaration/Environmental Assessment*, U.S. Department of Transportation, Federal Highway Administration and the State of California Department of Transportation, August 2010.

29.2 to post mile 41.8 in Inyo County. The new facility would have four 12-foot lanes with a variable median width and paved shoulders.

3.2.2 *State Route 136*

State Route 136 is a two-lane conventional highway that is classified as a Minor Arterial providing access to the historic sites of Dolomite, Swansea, and the community of Keeler.[13] Primary access to the northerly and easterly portions of Owens Lake also is provided via SR 136. SR 136 is a two-lane highway that is oriented northwest to southeast between U.S. Highway 395 to the north and SR 190 to the south. Twelve-foot wide lanes with unimproved gravel shoulders are provided in each direction on SR 136 in the project vicinity. The posted speed limit along SR 136 is 65 miles per hour.

At the SR 136 intersection with U.S. Highway 395, which is a "Tee" intersection, one-way stop sign control is provided at the westbound approach on SR 136. One left-turn lane and one channelized right-turn only lane are provided at the westbound approach on SR 136 at the U.S. Highway 395 intersection.

At the SR 136 intersection with SR 190, which is a "Tee" intersection, one-way stop sign control is provided at the eastbound approach on SR 190. One combination through/right-turn lane and one combination left-turn/through lane are provided at the southbound and northbound approaches on SR 136, respectively, at the SR 190 intersection.

3.2.3 *State Route 190*

State Route 190 is an interregional two-lane conventional highway that is classified as a Minor Arterial, which provides access from U.S. Highway 395 at the eastern flank of the Sierra Nevada Mountains to State Route 127 at Death Valley Junction near the California/Nevada border.[14] SR 190 is a two-lane highway that is oriented southwest to northeast between U.S. Highway 395 to the west and SR 136 to the east, and then is oriented to the southeast from the SR 136 intersection. Twelve-foot wide lanes with unimproved gravel shoulders are provided in each direction on SR 190 in the project vicinity. Primary access to the southerly portions of Owens Lake is provided via SR 190. The posted speed limit along SR 190 is 65 miles per hour.

At the SR 190 intersection with U.S. Highway 395, stop control is provided at the westbound approach on SR 190 and the west leg of the intersection is closed. One combination left-turn/right-turn lane is provided at the westbound approach on SR 190 at the U.S. Highway 395 intersection.

At the SR 190 intersection with SR 136, which is a "Tee" intersection, one-way stop sign control is provided at the eastbound approach on SR 190. One combination left-turn/right-turn lane is provided at the eastbound approach on SR 190 at the SR 136 intersection.

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[13] *State Route 136 Transportation Concept Report*, Caltrans District 9, Office of System Planning, June 2009.
[14] *State Route 190 Transportation Concept Report*, Caltrans District 9, Office of System Planning, 2003.

4.0 EXISTING TRAFFIC COUNTS

Recent traffic counts for U.S. Highway 395, SR 136 and SR 190 in the project vicinity were researched from data provided in *2012 Traffic Volumes on California State Highway System*, August, 2013, published by the California Department of Transportation (Caltrans). The Caltrans publication lists 2012 traffic volumes for all count locations on the California state highway system. Peak hours, peak month average daily traffic (ADT) volumes and annual ADT (AADT) volumes are shown for each count location in the publication. Significant volume changes (breakpoints) in the traffic profile along each route are counted and identified by name and milepost value.

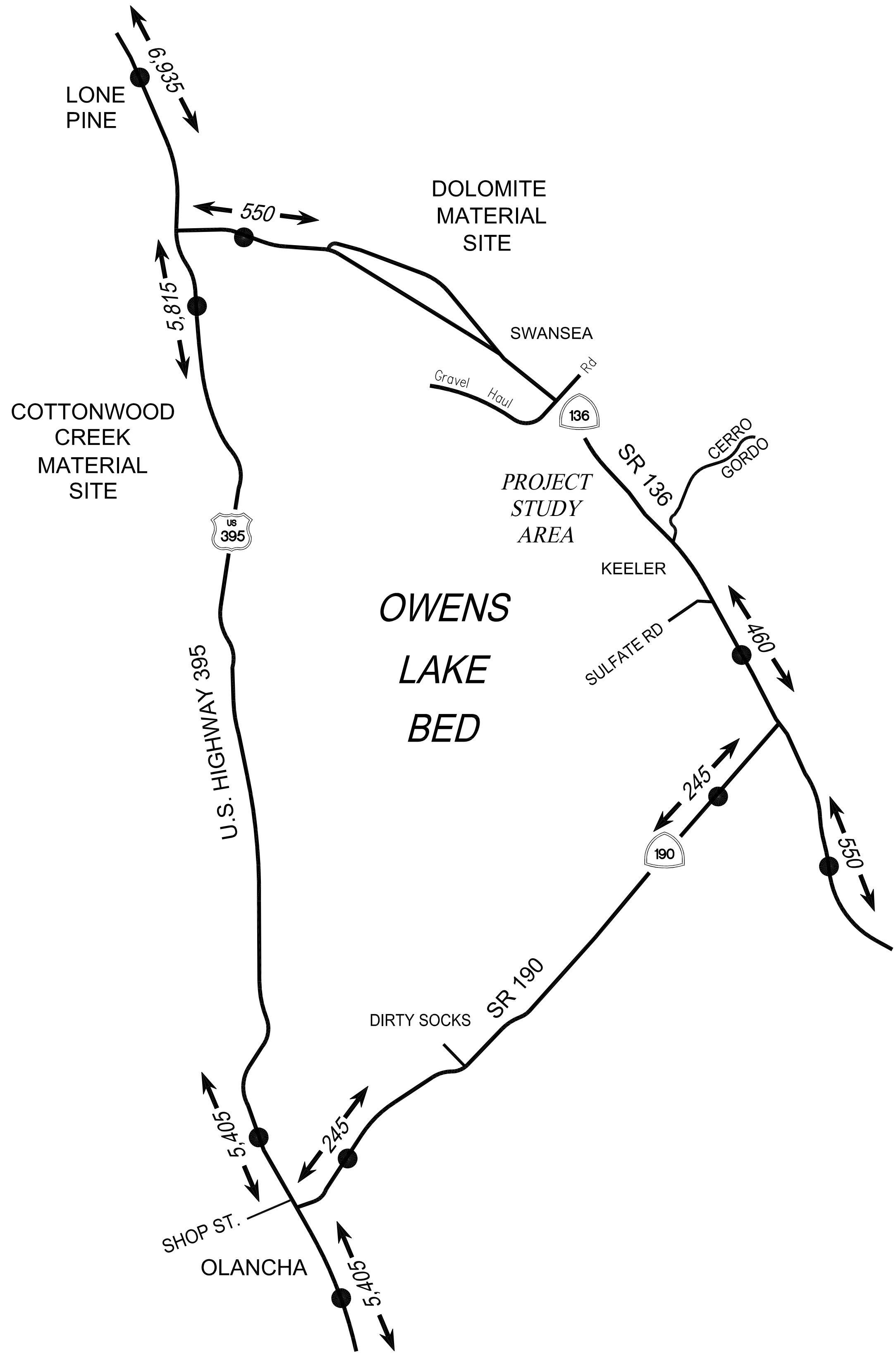
Annual ADT is the total traffic volume for the year divided by 365 days. The traffic count year data is collected from October 1st through September 30th. Very few locations in California are actually counted continuously. Traffic counting is generally performed by electronic counting instruments moved from location to location throughout the State in a program of continuous traffic count sampling. The resulting counts are adjusted to an estimate of annual average daily traffic by compensating for seasonal influence, weekly variation and other variables which may be present. Annual ADT is necessary for presenting a statewide picture of traffic flow, evaluating traffic trends, computing accident rates, planning and designing highways and other purposes.

The annual ADT volumes on U.S. Highway 395, SR 136 and SR 190 in the vicinity of Owens Lake are presented in ***Figure 4-1***. The 2012 traffic counts were increased by 1.0 percent (1.0%) per year to reflect year 2014 existing traffic volumes. This ambient traffic growth factor was based on traffic trend data provided in the *2012 Traffic Volumes on California State Highway System* (i.e., year 2007 to 2012 annual traffic volume data) and traffic data provided in recent environmental documents.[15] Thus, the existing traffic volumes utilized in this analysis (i.e., annual ADT figure, etc.) to reflect year 2014 conditions. Summary data worksheets of the annual ADT counts from the Caltrans publication are contained in ***Appendix A***.

4.1 U.S. Highway 395 Traffic Volumes

The AADT volume on U.S. Highway 395 between SR 136 and SR 190 varies between 5,405 and 5,815 vehicles per day, respectively, with a peak hour traffic volume of approximately 1,175 vehicles (year 2012 traffic volumes adjusted to reflect year 2014 conditions). This AADT volume is well below the capacity of the four lane section of the highway, extending between SR 136 and SR 190.

[15] *Olancha/Cartago Four-Lane Project, Initial Study with Proposed Mitigated Negative Declaration/Environmental Assessment*, U.S. Department of Transportation, Federal Highway Administration and the State of California Department of Transportation, August 2010.



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NOTE: YEAR 2012 COUNT DATA ADJUSTED TO REFLECT YEAR 2014 AADT VOLUMES

FIGURE 4-1
EXISTING ANNUAL ADT VOLUMES

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KEELER DUNES DUST MITIGATION PROJECT

4.2 State Route 136 Traffic Volumes

The AADT along SR 136 ranges from approximately 550 vehicles east of U.S. Highway 395 to approximately 460 vehicles near SR 190 at the Olancha cutoff (year 2012 traffic volumes adjusted to reflect year 2014 conditions). The peak hour traffic volume at both of these locations varies from approximately 90 to 100 vehicles per hour. The current traffic volume data indicates that this route is currently operating well below capacity.

4.3 State Route 190 Traffic Volumes

The AADT volume along SR 190 is approximately 245 vehicles both east of U.S. Highway 395 and west of SR 136 (year 2012 traffic volumes adjusted to reflect year 2014 conditions). The peak hour traffic volume at both of these locations is approximately 50 vehicles per hour. The current traffic volume data indicates that this route is currently operating well below capacity.

5.0 TRAFFIC FORECASTING METHODOLOGY

In order to estimate the traffic impact characteristics of the Keeler Dunes Dust Mitigation project, a multi-step process has been utilized. The first step is trip generation, which estimates the total arriving and departing traffic volumes on a peak hour and daily basis. The traffic generation potential is forecast by applying appropriate vehicle trip calculations for the project development tabulation.

The second step of the forecasting process is trip distribution, which identifies the origins and destinations of inbound and outbound project traffic volumes. These origins and destinations are typically based on demographics and existing/anticipated travel patterns in the study area.

The third step is traffic assignment, which involves the allocation of project traffic to study area streets and intersections. Traffic assignment is typically based on minimization of travel time, which may or may not involve the shortest route, depending on prevailing operating conditions and travel speeds. Traffic distribution patterns are indicated by general percentage orientation, while traffic assignment allocates specific volume forecasts to individual roadway links and intersection turning movements throughout the study area.

With the forecasting process complete and project traffic assignments developed, the impact of the proposed project is isolated by comparing operational (i.e., Levels of Service) conditions at the selected key roadway locations using expected future traffic volumes with and without forecast project traffic. The need for area traffic improvements can then be evaluated and the significance of the project's impacts identified.

5.1 Project Traffic Generation

Traffic generation is expressed in vehicle trip ends, defined as one-way vehicular movements, either entering or exiting the generating land use. Traffic volumes to be generated by the proposed project were forecast for the weekday AM and PM peak hours and over a 24-hour period. The weekday AM and PM peak hours reflect the peak one hour during the traditional commuting peak periods of 7:00 to 9:00 AM and 4:00 to 6:00 PM. The resource typically used by traffic engineers to forecast trip generation for development projects is the Institute of Transportation Engineers' (ITE) *Trip Generation Manual*[16]. However, in this instance, the ITE manual does not provide trip rates for a land use or operations such as the proposed project. The Keeler Dunes Dust Mitigation project is unique due to the nature of the planned schedule of activities and operations. Therefore, it was determined that it would be appropriate to forecast the trips generated by the project based on the planned components of the project (refer to *Table 2-1*) for the peak period of activities in terms of truck arrival/departures and number of workers at the site. Based on review of the planned project components, the peak period of activities will occur during the Planting and Watering period as follows:

[16] Institute of Transportation Engineers *Trip Generation Manual*, 9th Edition, 2012.

- Workers

  - A maximum of 72 workers including planting crews, watering crews, cultural monitors, etc., will be on-site on a daily basis.

  - Workers would be present at the proposed project site between 7:00 a.m. and 5:00 p.m., Monday through Saturday. Thus, workers are assumed to arrive prior to the AM peak period.

  - It is assumed that a total of 2.5 construction personnel trips per day would be made to/from the project site.

  - It is also conservatively assumed that each worker arrives via single occupancy vehicle.

- Heavy Equipment

  - Heavy equipment (e.g., ATVs, dozers, forklifts, etc.) associated with this construction period will be on the site at any given time.

  - It is assumed that the majority of all equipment would be left on-site for the duration of construction.

  - The transport of the equipment to the project site, including the hauling of pipelines, may result in a one-time, temporary, short-term impact, and are not included in the trip generation forecasts.

- Delivery of Plants

  - A total of 3,000 plants will be delivered on a daily basis six days a week.

  - It is assumed 1,000 plants will be delivered in semi-trailer trucks for a total of three (3) trucks per day.

  - In order to provide a conservative forecast, it is also assumed that the delivery of plants during this construction period will occur during the AM peak hour.

  - A 2.5 passenger car equivalency (PCE) factor has been assumed for semi-trailer trucks used for delivery of plants to the project site.

The trip generation forecasts for the proposed project are summarized in ***Table 5-1***. As presented in *Table 5-1*, the proposed project is expected to generate 16 PCE vehicle trips (8 inbound trips and 8 outbound trips) in the AM peak hour during the peak construction period for the proposed project. During the PM peak hour, the proposed project is expected to generate 72 PCE trips (72 outbound trips) during the peak construction for the proposed project. Over a 24-hour period, the proposed project is forecast to generate 196 daily PCE trip ends (98 inbound

Table 5-1
PROJECT TRIP GENERATION [1]

LAND USE	SIZE	DAILY TRIP ENDS [2] VOLUMES	AM PEAK HOUR VOLUMES [2]			PM PEAK HOUR VOLUMES [2]		
			IN	OUT	TOTAL	IN	OUT	TOTAL
Workers								
Maximum Number of Workers [3]	72 Employees	180	----	----	----	0	72	72
Delivery of Plants								
Number of Semi-Trailer Trucks [4]	3 Trucks	16	8	8	16	----	----	----
TOTAL		**196**	**8**	**8**	**16**	**0**	**72**	**72**

[1] The project trip generation forecast is based on the peak period of activities in terms of truck arrival/departures and number of workers at the site. Based on review of the planned project components, the peak period of activities will occur during the Planting and Watering period for construction of the proposed project.
[2] Trips are one-way traffic movements, entering or leaving.
[3] The project trip generation forecasts for the Workers component during the Planting and Watering period for construction of the proposed project is based on the following data and assumptions:
- A maximum total of 72 workers including planting crews, watering crews, cultural monitors, etc., will be on-site on a daily basis for the delivery and distribution of straw bales, and the planting and watering activities.
- Workers would be present at the proposed project site between 7:00 AM and 5:00 PM, Monday through Saturday. Thus, workers are assumed to arrive prior to the AM peak period.
- It is assumed that 2.5 construction personnel trips per day would be to/from the project site for the daily traffic volume forecast.
- It is also conservatively assumed that each worker arrives via single occupancy vehicle.

[4] The project trip generation forecasts for the Delivery of Plants during the Planting and Watering period for construction of the proposed project is based on the following data and assumptions:
- A total of 3,000 plants will be delivered on a daily basis six days a week.
- It is assumed 1,000 plants will be delivered in semi-trailer trucks for a total of three (3) trucks per day.
- In order to provide a conservative forecast, it is also assumed that the delivery of plants during this construction period will occur during the AM peak hour.
- A 2.5 passenger car equivalency (PCE) factor has been assumed for semi-trailer trucks used for delivery of plants to the project site.

trips and 98 outbound trips) during a typical weekday of the peak construction period for the proposed project. It is noted that the peak construction period (i.e., Planting and Watering) planned for the Keeler Dunes Dust Mitigation project is substantially less intensive than what occurred during prior DCM projects in the area (e.g., the 1998 SIP which occurred in late spring and early summer of 2002 when approximately 250 pieces of equipment and 200 construction personnel were mobilized on-site, etc.).

5.2 Project Traffic Distribution and Assignment

Project-related (construction and subsequent operation) traffic volumes both entering and exiting the site have been distributed and assigned to the adjacent roadway system based on the following considerations:

- The site's proximity to major traffic corridors (i.e., U.S. Highway 395, SR 136, SR 190);
- Expected localized traffic flow patterns based on adjacent roadway channelization and presence of traffic signals;
- Existing intersection traffic volumes;
- Ingress/egress availability at the project site assuming use of the existing gravel haul road at SR 136 for all project-related truck and employee access; and
- The location of the proposed project study area.

As previously discussed, all project-related vehicles including haul trucks, service/delivery vehicles, and employees shall utilize the existing gravel haul road at SR 136 for all access. This is an existing intersection which is used by trucks and workers for the ongoing phase 8 of the Owens Lake dust control project. The existing gravel haul road/SR 136 intersection forms a four-way intersection with appropriate advance signage including intersection (W2-1) and truck (W11-10) signs. Further, the use of the existing gravel haul road to access the project study area would limit the number of project-related trips through the community of Keeler.

5.3 Related Projects and Ambient Traffic Growth

The forecast of future without project conditions was prepared in accordance to procedures outlined in Section 15130 of the CEQA Guidelines. Specifically, the CEQA Guidelines provide two options for developing the future traffic volume forecast:

> "(A) A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the [lead] agency, or

(B) A summary of projections contained in an adopted local, regional or statewide plan, or related planning document, that describes or evaluates conditions contributing to the cumulative effect. Such plans may include: a general plan, regional transportation plan, or plans for the reduction of greenhouse gas emissions. A summary of projections may also be contained in an adopted or certified prior environmental document for such a plan. Such projections may be supplemented with additional information such as a regional modeling program. Any such document shall be referenced and made available to the public at a location specified by the lead agency."

As the proposed Keeler Dunes Dust Mitigation project is short term in nature (i.e., construction period of approximately one year) and most area related projects will be completed after the proposed project is completed, it was determined to forecast future cumulative traffic volumes with incorporation of an ambient traffic growth factor (i.e., "B" option above).

In order to account for related projects and regional ambient traffic growth, the year 2014 existing traffic volumes (i.e., year 2012 traffic volumes adjusted to reflect year 2014 conditions) were increased by 2.0 percent (2.0%) to reflect year 2015 future without project traffic volumes. This ambient traffic growth factor was based on traffic trend data provided in the *2012 Traffic Volumes on California State Highway System* (i.e., year 2007 to 2012 annual traffic volume data) and traffic data provided recent environmental documents.[17] Based on a review of the most recent three year reporting periods in the Caltrans document, essentially stable traffic volumes for state highway travel (e.g., year 2012 over 2011 was +0.24% while the prior three years indicated slightly decreasing traffic volumes). Thus, application of the above annual growth factor is intended to account for both known and unknown related projects in the vicinity of the proposed project, as well as any potential regional ambient traffic growth during the period when the Keeler Dunes Dust Mitigation project is under construction.

[17] *Olancha/Cartago Four-Lane Project, Initial Study with Proposed Mitigated Negative Declaration/Environmental Assessment*, U.S. Department of Transportation, Federal Highway Administration and the State of California Department of Transportation, August 2010.

6.0 TRAFFIC IMPACT ANALYSIS METHODOLOGY

The number of vehicle trips anticipated to be generated by the proposed project was estimated based on information presented in the Sections 2.0 and 5.0 of this report. The *2012 Traffic Volumes on California State Highway System* publication was used to determine the existing traffic volumes. As the proposed project does not generate a considerable number of vehicle trips and effects on traffic would occur only during construction, no Level of Service analyses were prepared for the roadway system. Therefore, the impacts of the construction and subsequent operation of the project on roadway operations and safety were qualitatively analyzed and discussed.

6.1 Impact Criteria and Thresholds

Level of Service (LOS) is a qualitative measure of traffic operating conditions whereby a letter grade A through F, corresponding to progressively worsening operating conditions, is assigned to an intersection or roadway segment. LOS A, B, and C are generally considered satisfactory to most motorists, while LOS D is marginally acceptable. LOS E and F are associated with severe congestion and delay, and are unacceptable to most motorists.

For purposes of this EIR, LOS C is considered the minimum acceptable standard for roadway segments as identified in the Inyo County General Plan. Degradation of roadway segment LOS below an adopted County standard or concept is a potentially significant impact. The six qualitative categories of Level of Service for two lane highways as described in the *Highway Capacity Manual 2010*[1] are provided below:

- At LOS A, motorists experience high operating speeds on Class I highways and little difficulty in passing. Platoons of three or more vehicles are rare. On Class II highways, speed would be controlled primarily by roadway conditions. A small amount of platooning would be expected. On Class III highways, drivers should be able to maintain operating speeds close or equal to the free-flow speed (FFS) of the facility.

- At LOS B, passing demand and passing capacity are balanced. On both Class I and Class II highways, the degree of platooning becomes noticeable. Some speed reductions are present on Class I highways. On Class III highways, it becomes difficult to maintain FFS operation, but the speed reduction is still relatively small.

- At LOS C, most vehicles are traveling in platoons. Speeds are noticeably curtailed on all three classes of highway.

- At LOS D, platooning increases significantly. Passing demand is high on both Class I and Class II facilities, but passing capacity approaches zero. A high percentage of vehicles are not traveling in platoons, and percent time-spent following (PTSF) is quite noticeable. On Class III highways, the fall-off from FFS is now significant.

[1] Chapter 15, Two-Lane Highways, in Volume 2 of the *HCM2010 Highway Capacity Manual*, Transportation Research Board of the National Academies, Washington, DC, 2010.

- At LOS E, demand is approaching capacity. Passing on Class I and Class II highways is virtually impossible, and PTSF is more than 80%. Speeds are seriously curtailed. On Class III highways, speed is less than two-thirds of FFS. The lower limit of this LOS represents capacity.

- LOS F exists whenever demand flow in one or both directions exceeds the capacity of the segment. Operating conditions are unstable, and heavy congestion exists on all classes of two-lane highways.

6.2 Traffic Impact Analysis Scenarios

Traffic impacts at the study intersections were analyzed for the following conditions:

[a] Existing conditions.

[b] Existing plus project conditions (i.e., traffic generation during peak activities during project construction).

[c] Condition [b] with implementation of project mitigation measures, where necessary.

[d] Condition [a] plus 2.0 percent (2.0%) ambient traffic growth through year 2015 (i.e., two percent per year).

[e] Condition [d] plus project conditions (i.e., traffic generation during peak activities during project construction).

[f] Condition [e] with implementation of project mitigation measures, where necessary.

The traffic volumes for each new condition were added to the volumes in the prior condition to determine the change in utilization and corresponding LOS at the study locations.

7.0 TRAFFIC ANALYSIS

As previously noted (refer to Section 4.0 herein), AADT volumes have been utilized in the traffic analysis for this report. Annual ADT is the total traffic volume for the year divided by 365 days. The traffic count year data is collected from October 1st through September 30th. Very few locations in California are actually counted continuously. Traffic counting is generally performed by electronic counting instruments moved from location to location throughout the State in a program of continuous traffic count sampling. The resulting counts are adjusted to an estimate of annual average daily traffic by compensating for seasonal influence, weekly variation and other variables which may be present. Annual ADT is necessary for presenting a statewide picture of traffic flow, evaluating traffic trends, computing accident rates, planning and designing highways and other purposes.

7.1 Existing Conditions

The following subsections present a summary of the existing conditions at each of the roadway segments included as part of this traffic analysis. It is important to note that the capacity of a two-lane highway is 1,700 passenger cars per hour in one direction, with a maximum of 3,200 passenger cars per hour in the two directions. The capacity of a multilane highway segment under base conditions varies with the free flow speed (FFS). For 60 miles per hour (mph) FFS, the capacity is 2,200 passenger cars per hour per lane. For less FFSs, capacity diminishes. For 55 mph FFS, the capacity is 2,100 passenger cars per hour per lane; for 50 mph FFS, 2,000 passenger cars per hour per lane; and for 45 mph FFS, 1,900 passenger cars per hour per lane.[2]

7.1.1 *U.S. Highway 395 Existing Conditions*

The AADT volume on U.S. Highway 395 between SR 136 and SR 190 varies between 5,405 and 5,815 vehicles per day, respectively, with a peak hour traffic volume of approximately 1,175 vehicles (year 2012 traffic volumes adjusted to reflect year 2014 conditions). This AADT volume is well below the capacity of the four lane section of the highway, extending between SR 136 and SR 190. U.S Highway 395 currently operates at LOS A under existing conditions for the four lane section of the highway. However, as noted in the Olancha/Cartago Four-Lane Project MND/EA, the two lane section of the highway near the communities of Cartago and Olancha currently operates at LOS D, but will operate at LOS A upon completion of the four-lane highway improvement project.

7.1.2 *State Route 136 Existing Conditions*

The AADT along SR 136 ranges from approximately 550 vehicles east of U.S. Highway 395 to approximately 460 vehicles near SR 190 at the Olancha cutoff (year 2012 traffic volumes adjusted to reflect year 2014 conditions). The peak hour traffic volume along the subject locations is approximately 100 vehicles per hour. The current traffic volume data indicates that this route is currently operating well below capacity. State Route 136 currently operates at LOS A under existing conditions.

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[2] *HCM2010 Highway Capacity Manual*, Transportation Research Board of the National Academies, Washington, DC, 2010.

7.1.3 *State Route 190 Existing Conditions*

The AADT volume along SR 190 ranges from approximately 245 vehicles both east of U.S. Highway 395 and west of SR 136 (year 2012 traffic volumes adjusted to reflect year 2014 conditions). The peak hour traffic volume at both of these locations is approximately 50 vehicles per hour. The current traffic volume data indicates that this route is currently operating well below capacity. State Route 190 currently operates at LOS A under existing conditions.

7.2 Existing With Project Conditions

As the Planting and Watering period for construction of the project results in the highest level of overall vehicle trip generation, the existing with project conditions analysis only considers this period of the project. In order to provide a conservative worst-case analysis, all 196 daily vehicle trips anticipated to be generated by the project during this construction phase were assigned to each highway in the project vicinity. Based on the roadway lane capacities of the highways, the existing year 2014 daily traffic volumes on the State highways, and the forecast daily project trip generation, no significant impacts are expected to occur along U.S. Highway 395, SR 136, and SR 190, as discussed further in the following sections. However, periodic events during which equipment is hauled to the site may result in safety hazards associated with other oncoming or turning vehicles on U.S. Highway 395, SR 136 and SR 190. In addition, overweight trucks transporting material, equipment, and other construction materials could potentially result in some damage to the roadway surface of the State Highways. Therefore, these impacts can be considered potentially significant. Refer to Section 8.0 of this report for further discussion.

7.2.1 *U.S. Highway 395 Existing With Project Conditions*

The AADT volumes on U.S. Highway 395 between SR 136 and SR 190 with the addition of temporary construction project-related traffic would vary between approximately 5,602 and 6,010 vehicles per day, respectively. This AADT volume is well below the capacity of the four lane section of the highway, extending between SR 136 and SR 190. U.S Highway 395 would continue to operate at LOS A under existing with project conditions for the four lane section of the highway. In addition, the two lane section of the highway near the communities of Cartago and Olancha would continue to operate at the existing LOS D conditions with the addition of temporary construction project-related traffic.

7.2.2 *State Route 136 Existing With Project Conditions*

The AADT volumes along SR 136 with the addition of temporary construction project-related traffic would range from approximately 747 vehicles east of U.S. Highway 395 to approximately 655 vehicles near SR 190 at the Olancha cutoff. State Route 136 would continue to operate at LOS A in the existing with project conditions.

7.2.3 *State Route 190 Existing With Project Conditions*

The AADT volume along SR 190 with the addition of temporary construction project-related traffic would range from approximately 441 vehicles both east of U.S. Highway 395 and west of SR 136. State Route 190 would continue to operate at LOS A in the existing with project conditions.

7.3 Future Without Project Conditions

The following subsections present a summary of the future without project conditions at each of the roadway segments included as part of this traffic analysis. In order to forecast the future without project traffic volumes, the year 2014 existing traffic volumes (i.e., year 2012 traffic volumes adjusted to reflect year 2014 conditions) were increased by 2.0 percent (2.0%) to reflect year 2015 future without project traffic volumes. This ambient traffic growth factor was based on traffic trend data provided in the *2012 Traffic Volumes on California State Highway System* (i.e., year 2007 to 2012 annual traffic volume data) and traffic data provided in recent environmental documents. Based on a review of the most recent three year reporting periods in the Caltrans document, essentially stable traffic volumes for state highway travel (e.g., year 2012 over 2011 was +0.24% while the prior three years indicated slightly decreasing traffic volumes) are indicated. Thus, application of the above annual growth factor is intended to account for both known and unknown related projects in the vicinity of the proposed project, as well as any potential regional ambient traffic growth during the period when the Keeler Dunes Dust Mitigation project is under construction.

7.3.1 *U.S. Highway 395 Future Without Project Conditions*

The future without project AADT volume on U.S. Highway 395 between SR 136 and SR 190 would vary between approximately 5,515 and 5,930 vehicles per day, respectively. This AADT volume is well below the capacity of the four lane section of the highway, extending between SR 136 and SR 190. U.S Highway 395 would continue to operate at LOS A in the future without project conditions for the four lane section of the highway. In addition, the two lane section of the highway near the communities of Cartago and Olancha would continue to operate at LOS D conditions in the future without project conditions (i.e., same LOS as under existing conditions). It is noted that with the Olancha/Cartago Four-Lane Project completion, the LOS for this segment will improve to LOS A under future conditions.

7.3.2 *State Route 136 Future Without Project Conditions*

The future without project AADT volume along SR 136 would range from approximately 560 vehicles east of U.S. Highway 395 to approximately 470 vehicles near SR 190 at the Olancha cutoff. State Route 136 would continue to operate at LOS A in the future without project conditions.

7.3.3 *State Route 190 Future Without Project Conditions*

The future without project AADT volume along SR 190 would range from approximately 250 vehicles both east of U.S. Highway 395 and west of SR 136. State Route 190 would continue to operate at LOS A in the future without project conditions.

7.4 Future With Project Conditions

As the Planting and Watering period for construction of the project results in the highest level of overall vehicle trip generation, the future with project conditions analysis only considers this period of the project. In order to provide a conservative worst-case analysis, all 196 daily vehicle trips anticipated to be generated by the project during this construction phase were assigned to each highway in the project vicinity. Based on the roadway lane capacities of the highways, the future year 2015 daily traffic volumes on the State highways, and the forecast daily project trip generation, no significant impacts are expected to occur along U.S. Highway 395, SR 136, and SR 190, as discussed further in the following sections. However, periodic events during which equipment is hauled to the site may result in safety hazards associated with other oncoming or turning vehicles on U.S. Highway 395, SR 136 and SR 190. In addition, overweight trucks transporting material, equipment, and other construction materials could potentially result in some damage to the roadway surface of the State Highways. Therefore, these impacts can be considered potentially significant. Refer to Section 8.0 of this report for further discussion.

7.4.1 *U.S. Highway 395 Future With Project Conditions*

The future with project AADT volume on U.S. Highway 395 between SR 136 and SR 190 would vary between approximately 5,710 and 6,126 vehicles per day, respectively. This AADT volume is well below the capacity of the four lane section of the highway, extending between SR 136 and SR 190. U.S Highway 395 would continue to operate at LOS A in the future with project conditions for the four lane section of the highway. In addition, the two lane section of the highway near the communities of Cartago and Olancha would continue to operate at LOS D conditions in the future with project conditions (i.e., same LOS as under existing conditions). It is noted that with the Olancha/Cartago Four-Lane Project completion, the LOS for this segment will improve to LOS A under future conditions.

7.4.2 *State Route 136 Future With Project Conditions*

The future with project AADT volume along SR 136 would range from approximately 758 vehicles east of U.S. Highway 395 to approximately 664 vehicles near SR 190 at the Olancha cutoff. State Route 136 would continue to operate at LOS A in the future with project conditions.

7.4.3 *State Route 190 Future With Project Conditions*

The future with project AADT volume along SR 190 would range from approximately 446 vehicles both east of U.S. Highway 395 and west of SR 136. State Route 190 would continue to operate at LOS A in the future with project conditions.

8.0 RECOMMENDED TRANSPORTATION MEASURES

The following transportation improvement measures are recommended to reduce the potential impacts due to the construction of the project to less than significant levels:

- All project-related vehicles including haul trucks, service/delivery vehicles, and employees shall utilize the existing gravel haul road at SR 136 for all access. This is an existing intersection which is used by trucks and workers for the ongoing phase 8 of the Owens Lake dust control project. The existing gravel haul road/SR 136 intersection forms a four-way intersection with appropriate advance signage including intersection (W2-1) and truck (W11-10) signs. Further, the use of the existing gravel haul road to access the project study area would limit the number of project-related trips through the community of Keeler.

- The State of California Department of Transportation shall determine the necessity for traffic safety equipment to be installed and maintained on U.S Highway 395, SR 136 and SR 190 in order to ensure traffic safety during the construction of the proposed project. Some examples of typical traffic safety equipment/measures include warning lights, signage, and cones. Any required traffic safety equipment, which would warn oncoming motorists that there may be large, slow-moving trucks ahead, would be designed consistent with Caltrans standards.

- Flag persons should be utilized where necessary to warn motorists that there may be large, slow-moving trucks ahead, particularly during peak periods and times of large load deliveries.

- Traffic safety equipment shall be installed prior to use of U.S. Highway 395, SR 136, and SR 190 for straw bale hauling or other heavy truck trips such as the delivery of heavy equipment and construction vehicles to the project site.

- Prior to commencement of project construction activities, a pre-construction road condition survey assessment shall be prepared in order to document existing roadway conditions. Any roadways that are damaged by project construction activities shall be repaired and the roadways shall be returned to pre-project conditions. All road repairs will be scheduled and conducted to ensure that safe operating conditions are maintained.

In addition to the above measures and as previously noted, traffic controls and signage and all additional safety specifications resulting from mitigation measures, permit conditioning, and conditions of approval shall be employed.

9.0 CONCLUSIONS

This traffic analysis has been prepared to identify and evaluate the potential transportation impacts associated with implementation of the Dust Mitigation Program for Owens Lake in Inyo County, California. The proposed Keeler Dunes Dust Mitigation project involves establishment of native vegetation cover coupled with straw bales as a temporary wind barrier to control fugitive dust emissions in the Keeler Dunes and to meet ambient air quality standards. The goal of the proposed project is stabilize the Keeler Dunes such that high wind events will not result in fugitive dust emissions that exceed the federal and state standards within the local communities. The proposed project is anticipated to be constructed within approximately one year with periodic maintenance in following years.

The impacts of the construction of the project on roadway operations and safety were qualitatively analyzed and discussed (refer to Section 7.0 herein). Based on the roadway lane capacities of the highways, the future year daily traffic volumes on the State highways, and the forecast daily project trip generation, it is concluded that no significant impacts are expected to occur along the U.S. Highway 395, SR 136, and SR 190. However, periodic events during which equipment is hauled to the site may result in safety hazards associated with other oncoming or turning vehicles on U.S. Highway 395, SR 136 and SR 190. In addition, overweight trucks transporting material, equipment, and other construction materials could potentially result in some damage to the roadway surface of the State Highways. Therefore, these impacts can be considered potentially significant. Transportation improvement measures are recommended to reduce the potential impacts due to the construction of the project to less than significant levels (refer to Section 8.0 herein).

APPENDIX

TRAFFIC COUNT DATA

2011 TRAFFIC VOLUMES

ON THE CALIFORNIA STATE HIGHWAY SYSTEM

STATE OF CALIFORNIA

BUSINESS, TRANSPORTATION AND HOUSING AGENCY

DEPARTMENT OF TRANSPORTATION

DIVISION OF TRAFFIC OPERATIONS

Sacramento, CA 95814

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PREFACE

Traffic Trend

A comparison of the 2011 over 2010 annual traffic volume data shows that state highway travel decreased in 2011. This year's decrease in vehicle miles of travel on California highways compares with prior years as follows:

*2011 over 2010	- 1.1%
2010 over 2009	- 0.2%
2009 over 2008	- 0.6%
2008 over 2007	+3.5%
2007 over 2006	+1.0%

Traffic Profile

This booklet lists 2011 traffic volumes for all count locations on the California state highway system. Peak hours, peak month ADTs and annual ADTs are shown at each count location. Significant volume changes (breakpoints) in the traffic profile along each route are counted and identified by name and milepost value. In addition to the profile breakpoints, the booklet lists county lines and landmarks to aid in orientation.

The numbers shown in this booklet apply to the highway immediately back and ahead of the locations. Therefore, between any two successive breakpoints along the route it may be assumed that traffic volumes will vary from one breakpoint to the next at a reasonably uniform rate of increase or decrease. Where only a single set of figures appears between two breakpoints, a constant volume of traffic may be assumed for the intervening section of highway.

All traffic volume figures listed in this booklet include traffic in both directions unless otherwise indicated.

Route Number

All California state highways are listed in this booklet in order of Legislative Route number.

Milepost

Each profile breakpoint is identified by the milepost value corresponding to that point on the highway. The milepost values increase from the beginning of a route within a county to the next county line. The milepost values start over again at each county line. Milepost values usually increase from South to North or West to East depending upon the general direction the route follows within the state.

The milepost at a given location will remain the same year after year. When a section of road is relocated, new mileposts (usually noted by an alphabetical prefix such as "R" or "M") are established for it.

* Based on the Traffic Data Branch's Estimated Monthly Vehicle Miles of Travel Report.

Dist	Route	CO		Postmile		Description	Back Peak Hour	Back Peak Month	Back AADT	Ahead Peak Hour	Ahead Peak Month	Ahead AADT
5	135	SB		16.77		SANTA MARIA, DONOVAN	2100	22000	20900	1800	20000	19000
5	135	SB		17.806		SANTA MARIA, JCT. RTE. 101	1800	20000	19000			
9	136	INY		0		JCT. RTE. 395				100	800	540
9	136	INY		17.73		JCT. RTE. 190	70	680	430			
6	137	KIN		0		JCT. RTE. 43				410	2950	2600
6	137	KIN		2.061		KINGS/TULARE CO LINE	380	3550	3300			
6	137	TUL		0		KINGS/TULARE CO LINE				310	2900	2700
6	137	TUL		1.86		RD 28	310	2900	2700	330	3000	2800
6	137	TUL		7.2		RD 228	370	3350	3150	240	2150	2000
6	137	TUL		13.28		RD 84	270	2400	2250	310	2850	2650
6	137	TUL		14.26		TULARE, SOUTH WEST ST	580	5300	5000	570	6100	5700
6	137	TUL		14.76		TULARE, PRATT/BROOKLYN	920	8500	7900	1050	9700	9000
6	137	TUL		14.98		SOUTH E ST	1050	9700	9000	1200	11300	10500
6	137	TUL	R	15.38		TULARE, M ST/TULARE	1200	11600	10700	1000	9900	9200
6	137	TUL	R	15.53		TULARE, SOUTH L ST	710	7000	6500	530	5900	5000
6	137	TUL	R	15.6		TULARE, M ST/INYO	530	5900	5000	620	6100	5600
6	137	TUL	R	15.78		TULARE, M ST	620	6100	5600	1150	10700	10500
6	137	TUL		15.94		TULARE, O ST	1150	10700	10500	1400	12600	12400
6	137	TUL		16.116		TULARE, CHERRY AVE	1350	12600	12400	1600	15300	15000
6	137	TUL		16.489		TULARE, BLACKSTONE AVE	1600	15300	15000	2550	24000	23500
6	137	TUL		16.628		TULARE, JCT. RTE. 99	2550	24000	23500	2000	19100	18700
6	137	TUL		17.01		TULARE, LASPINA/RD 112	2000	19100	18700	1350	16600	16300
6	137	TUL		17.511		TULARE, JCT. RTE. 63 N	1700	15900	15600	1400	15600	14000
6	137	TUL		20.46		LOVERS LANE/ RD 140	1000	11400	11200	900	10400	9900
6	137	TUL		23.897		FARMERSVILLE/RD 168	990	11600	11000	950	11700	10600
6	137	TUL		27.396		JCT. RTE. 65	960	11700	10600			
7	138	LA		0	R	JCT. RTE. 5				200	1850	1475
7	138	LA		1.392	R	END INDEP ALIGN	200	1850	1475	200	1850	1475
7	138	LA		0	L	BEGIN INDEP ALIGN LT LNS	200	1850	1475	200	1850	1475
7	138	LA		1.392	L	END INDEP ALIGN	200	1850	1475	400	3700	2950

Dist	Route	CO		Postmile	Description	Back Peak Hour	Back Peak Month	Back AADT	Ahead Peak Hour	Ahead Peak Month	Ahead AADT
6	190	TUL		24.45	TULE INDIAN RESERVATION/AVE 160	590	7100	6000	590	7000	6000
6	190	TUL		27.295	RIVER ISLAND RD	440	5300	4500	420	5000	4300
6	190	TUL	R	31.55	SPRINGVILLE, CRAMER DRIVE	410	4450	3800	390	4250	3650
6	190	TUL		31.701	JCT. OLD RTE. 190	440	4750	4050	420	5400	3900
6	190	TUL	R	32.704	BALCH PARK DRIVE	270	3500	2500	170	1250	850
6	190	TUL		47.98	CAMP NELSON RD	140	1050	700	80	590	400
6	190	TUL		56.567	QUAKING ASPEN CAMP	80	590	400			
9	190	INY		9.85	OLANCHA, JCT. RTE. 395				50	350	230
9	190	INY		24.55	JCT. RTE. 136 NW	50	350	230	110	730	520
9	190	INY		85.83	STOVEPIPE WELLS	150	1000	650	250	1200	900
9	190	INY		93.21	SCOTTY'S CASTLE RD	250	1200	900	180	1250	810
9	190	INY		99.77	BEATTY CUTOFF RD	220	1550	1050	200	1500	950
9	190	INY		110.72	FURNACE CREEK RANCH	370	2050	1250	340	1500	1050
9	190	INY		111.73	BAD WATER RD	340	1500	1050	170	1200	1000
9	190	INY		140.69	DEATH VALLEY, JCT. RTE. 127	150	1200	850			
3	191	BUT		0	JCT. RTE. 70				650	5300	4700
3	191	BUT		3.53	DURHAM/PENTZ RD	650	5300	4700	740	6200	6100
3	191	BUT		3.925	BUTTE COLLEGE DRIVE	740	6200	6100	580	5800	5700
3	191	BUT		8.655	PARADISE, AIRPORT RD	580	5800	5700	560	5800	5700
3	191	BUT		10.08	EASY ST	560	5800	5700	540	6000	5900
3	191	BUT		11.13	PARADISE, BUSHMAN RD	540	6000	5900	1000	10400	10100
3	191	BUT		11.386	PARADISE, PEARSON RD	1000	10400	10100			
5	192	SB	R	0.019	JCT. RTE. 154				1150	12000	10900
5	192	SB		0.18	CIENEGITAS AVE	1150	12000	10900	1400	11000	10000
5	192	SB		1.64	SANTA BARBARA, ONTARE	1400	11000	10000	1300	11000	10000
5	192	SB		4.15	SANTA BARBARA, MOUNTAIN	320	3300	3040	490	4000	3600
5	192	SB		5.99	SANTA BARBARA, JCT. RTE. 144 S	480	3700	3360	570	3700	3360
5	192	SB		8.28	HOT SPRINGS RD	550	4300	3900	1200	8000	7300
5	192	SB		8.82	SAN YSIDRO RD	1100	10500	9500	1050	8500	7700
5	192	SB		10.74	SHEFFIELD DRIVE	620	5100	4600	360	2900	2620

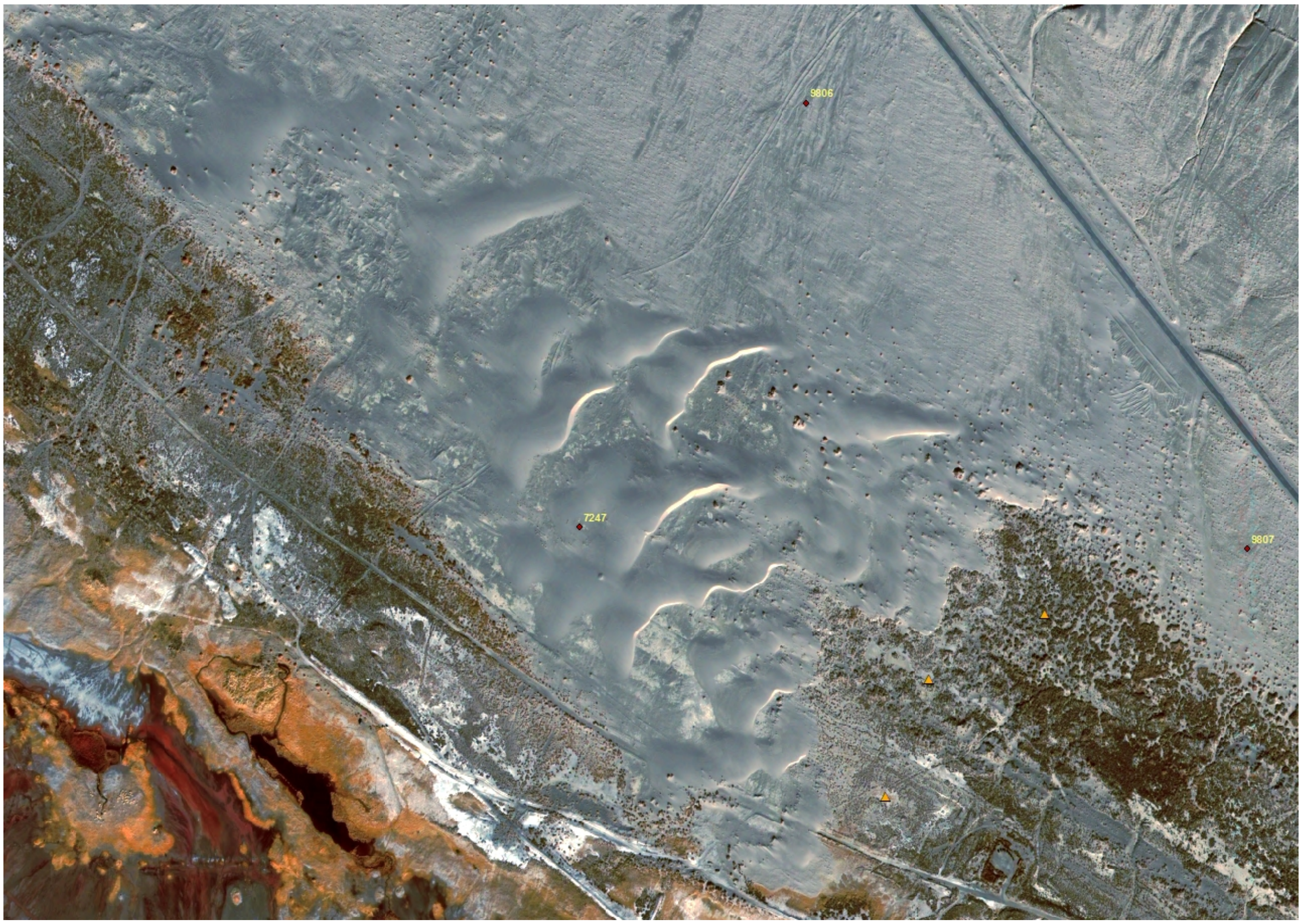
Dist	Route	CO		Postmile	Description	Back Peak Hour	Back Peak Month	Back AADT	Ahead Peak Hour	Ahead Peak Month	Ahead AADT
8	371	RIV		71.31	ANZA, CONTRERAS RD	710	7300	7000	710	7300	7000
8	371	RIV		77.148	JCT. RTE. 74	480	3950	3800			
4	380	SM	T	4.703	SAN BRUNO, JCT. RTE. 280				10500	147000	139000
4	380	SM		5.465	SAN BRUNO, JCT. RTE. 82	10500	147000	139000	12000	168000	159000
4	380	SM		6.373	S SAN FRANCISCO, JCT. RTE. 101	12000	168000	159000	13900	194000	184000
4	380	SM		6.76	SOUTH AIRPORT RD	13900	194000	184000			
8	395	SBD	R	3.981	JCT. RTE. 15				2050	25000	24000
8	395	SBD	R	5.613	PHELAN/MAIN ST	2300	28500	27000	2050	25000	24000
8	395	SBD		8.62	BEAR VALLY RD	2050	25000	24000	1850	23100	22000
8	395	SBD		10.213	LUNA RD	1850	23100	22000	1800	22100	21000
8	395	SBD		11.18	PALMDALE RD; JCT. RTE. 18	1800	22100	21000	1500	18800	18000
8	395	SBD		15.707	GEORGE AIR FORCE BASE	1450	19100	18000	1800	16800	15000
8	395	SBD		17.777	ADELANTO, EL MIRAGE	1800	16800	15000	1150	10600	9500
8	395	SBD		45.948	JCT. RTE. 58	840	7800	7000	490	4700	4100
8	395	SBD		72.77	TRONA RD	490	4700	4100	570	4700	4000
8	395	SBD		73.518	SAN BERNARDINO/KERN CO LINE	570	5000	4000			
6	395	KER		0	SAN BERNARDINO/KERN CO LINE				570	4950	4000
6	395	KER	R	1.152	REDROCK, RANDSBURG	580	5300	4200	590	5300	4200
6	395	KER	R	14.995	CHINA LAKE RD	570	5200	4100	410	3600	2950
6	395	KER	R	23.48	JCT. RTE. 178	420	4400	2850	450	3700	2750
6	395	KER	R	29.64	JCT. RTE. 14 S	450	3700	2750	1050	7200	5650
6	395	KER	R	36.824	KERN/INYO CO LINE	1050	7200	5400			
9	395	INY	R	0	KERN/INYO CO LINE				1050	7200	5400
9	395	INY		34.674	JCT. RTE. 190 E	940	7500	5400	1000	7300	5600
9	395	INY		55.827	JCT. RTE. 136 SE	1050	7400	5800	1100	8600	6600
9	395	INY		57.67	LONE PINE, WHITNEY PORTAL	1200	9300	7000	1150	8500	6500
9	395	INY	R	58.814	PANGBORN LANE	1050	7800	6000	1050	7800	6000
9	395	INY		73.41	INDEPENDENCE, MARKET	1100	8000	6200	1100	8200	6300
9	395	INY		73.85	INDEPENDENCE MAINT STA	1100	8200	6300	1050	7700	6050
9	395	INY		100.83	BIG PINE, JCT. RTE. 168 NE	1050	7800	6000	1100	9600	7800

APPENDIX I
KEELER DUNES INVESTIGATION: PROJECT STUDY PLAN

Keeler Dunes Investigation

Project Study Plan

September 2010



Great Basin Unified Air Pollution Control District

Bishop, California

Keeler Dunes Investigation

Project Study Plan

September 2010

Table of Contents | Page

List of Figures

Keeler Dunes Investigation

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I. Project Questions. The Keeler Dunes Investigation can be defined as working to answer a series of questions. The project components are designed with the goal of obtaining answers to as many of these questions as possible. A list of the main questions is provided here.

1) When did the Keeler Dunes and sand deposit form?
2) What is the source of material for the dunes?
3) How did the dunes form?
4) How have the dunes changed over time?
5) What is the relationship of the Keeler Dunes to existing vegetated shoreline dunes and the Swansea Dunes?
6) Are the shoreline dunes a natural feature that was present before the lake desiccated?
7) What is the sand budget within the Keeler Dunes?
8) What is the sand flux rate within the dune system?
9) How much spatial variability is there in the sand motion?
10) What is the volume change within the dunes? By storm? Seasonal? Annual?
11) Where are the dunes moving to?
12) What is the rate of movement of the Keeler Dunes?
13) Is the Keeler sand deposit expected to move into Keeler? If so, when?
14) What is the estimate of material being fed into the dune system prior to dust controls?
15) What is the predicted change in the dunes in the future given no controls?
16) What is the threshold wind speed required for dust generation? Does it vary across the study area?
17) Can the shoreline dunes and Swansea dunes be used as a model for a stable natural system?
18) What is the sand motion within these naturally stable areas?
19) What is the vegetation cover within the Keeler Dunes? How does this compare to the shoreline and Swansea dune area?
20) Which areas within the study area need to be controlled?
21) What level of control is needed?
22) What are control strategy options?
23) What is the project timeline?
24) What environmental work needs to be done? Can we start some of it now?

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II. Keeler Dunes Project Overview

The Keeler Dunes and associated sand deposits are situated northwest from the community of Keeler on the Keeler alluvial fan east of the exposed bed of Owens Lake (Figure 1). The loose sands that compose the dunes and sand sheet are mobile and cause dust emissions during high wind events. The Keeler Dune area is one of the last main dust sources that cause and contribute to exceedances of the state and federal 24-hour PM10 standard in the community of Keeler (Figure 1). As a result of these high PM10 concentrations, the Great Basin Unified Air Pollution Control District (District) identified the Keeler Dunes as one of the areas that need to be controlled in order to attain the PM10 standard within the Owens Valley Planning Area (OVPA) (GB, 2008a).

The District first began formal monitoring of the sand motion in the Keeler Dunes in April 2000 with the installation of two monitoring sties. Ten additional sites were added in October 2008 as part of a project to collect more detailed temporal and spatial sand transport data within the Keeler sands. Two camera sites were also added with vantages over the dune area to view dust activity during wind events (Figure 2). Also, as part of the Keeler Dunes Investigation, work has begun to map and characterize the historical development of the sand deposit as well as to better understand the dynamic system and its future evolution. The purpose of this document is to present an overall study plan for the project in order to tie all of the components together with the goal of developing a dust control strategy and associated mitigation plan.

The timeline for this project is aggressive. The OVPA Revised 2008 State Implementation Plan (2008 SIP, (GB, 2008a)) requires attainment of the 24-hr PM10 standard by March 2017. In order to achieve attainment by that date, the District Board must issue an order for control by January 1, 2012 and controls must be fully implemented by January 1, 2014. Along with the development of a control strategy and an order by the Great Basin Governing Board for the control of the Keeler Dunes is an associated environmental analysis to meet the requirements of CEQA (California Environmental Quality Act) and possibly NEPA (National Environmental Policy Act).

III. Background

Historic Owens Lake prior to water diversions of the Owens River and tributary streams had a surface area of approximately 110 square miles and a shoreline at an elevation of about 3,597 feet MSL. Following water diversion from inflow sources and a subsequent drop in the water level of the lake, large expanses of lake bed sediments were exposed. Due to the bathymetry of the lake bottom, the broadest expanses of exposed lake bed were in a 2 to 3 mile wide band that wraps along the shore of the eastern side of the lake bed. Large dust sources developed on the exposed lake bed creating high particulate concentrations within the region during high wind events.

One of the largest dust source areas, in terms of frequency, repeatability, and magnitude, was located on the north eastern portion of the lake bed in an area termed the North Sand Sheet (NSS) (Figure 3). The soil composition in the NSS is predominantly sandy with the primary source of sediment from the Owens River and smaller component from the Inyo Mountains to the east of Owens Lake. With continual exposure to high winds since desiccation of the lake (in 1926), much of the sand in the NSS moved off of the lake bed forming a deposit of aeolian material on the adjacent alluvial fan (Keeler Fan). Reworking of the sands over time has caused the character of the sand deposit to change. Currently, the Keeler sand deposit is about 1.3 square miles in areal extent (Figure 2) and appears to be spreading to the east and southeast toward the community of Keeler and the foothills of the Inyo Mountains.

Most of the land on which the Keeler sand deposit is located is owned by the U.S. government and is under the jurisdiction of the Bureau of Land Management (BLM) (Figure 4). Other groups that also own land within the Keeler sands or are an interested party in their control include the City of Los Angeles, local Paiute-Shoshone Tribes, Southern Pacific Railroad, Keeler Community Services District and Keeler/Swansea residents. The work on this project is being done by a team of researchers from the District, the Desert Research Institute (DRI), and HydroBio INC.

IV. Project Components

The objective of the Keeler Dunes Investigation is to develop a control strategy for mitigation of the windblown dust that impacts the community of Keeler and the surrounding region. One of the main steps in achieving this goal is to identify the areas within the Keeler Dunes sand deposit that cause or contribute to violations of the federal 24-hour PM10 standard in the community of Keeler and therefore need to be controlled. However, there are other steps that need to be completed as well in order to achieve successful dust mitigation of the dunes.

The investigation itself is composed of multiple components. The components are designed to provide answers to questions that can be broadly grouped into the following categories:

1. What is the origin and development of the dunes?
2. What is the character of the Keeler Dunes deposit?
3. What is the nature of sand motion and dust emissions within the dunes?
4. What methods can be used for stabilization and control of the dunes and how can they be implemented?

The work tasks within the components of the project range from historical research on the development of the Keeler Dune sand deposit, to relative and absolute dating of material within the Keeler Dune deposit and adjacent shoreline dunes, to field mapping and surveying of the current aeolian deposit and associated features, to quantitative analysis of sand motion and emission rates within the Keeler Dune sand area, and finally to a numerical analysis to determine which areas need to be controlled. These components are discussed below.

a. <u>Development of the Keeler Dunes</u>

One of the components of the Keeler Dunes Investigation is to gain a more thorough understanding of the formation of the Keeler sand deposit and its development over time. Determining the origin, age and movement of the aeolian sands and dune formation within the Keeler deposit is central in determining who is responsible for their mitigation. Currently, there is no consensus among the different groups involved on when the Keeler Dunes and associated sand deposit developed (i.e., the age of the aeolian sand deposits), how they have changed over time, and the source of the material within the dune area. The District's current hypothesis is that the Keeler Dunes formed in response to the exposed material from the North Sand Sheet moving off of the lake bed following desiccation of Owens Lake. Completion of this portion of the project will provide information to test this hypothesis.

Several different avenues are being pursued in order to develop an understanding of when, where, and how the Keeler Dunes formed. The bulk of information on the development of the Keeler Dunes will come from analysis and interpretation of historic air photographs and satellite imagery on which the extent of the sand deposits and individual dune features are discernable. Written records and ground-based photographs from historical activities along the eastern shore of Owens Lake will be used to augment the record and provided insight on changes present in the landscape of the area over time.

Imagery - Air Photos and Satellite Imagery

The District and researchers from DRI are working on developing a library of air photos and satellite images of the Keeler Dune area that extend as far back in time as possible. Currently, the library contains photos and images that range from 1947 to 2010. The bulk of the imagery is from about 1990 to the present. Gaps in the photo/imagery record include the time period in the 1950s and 1960s as well as photos prior to 1947. An effort is being made to search for these critical gaps in the photographic record.

Features that are visible on the imagery include the extent of the aeolian sand deposits on the Keeler Fan, the presence of distinct dune forms, the presence of large greasewood mounds, changes in vegetation cover and type, the presence of exposed intra-dune mudflats, as well as other features depending on the resolution of the image being analyzed. Examination of these features through the sequence of photos and imagery provides answers to the questions concerning the growth and development of the sand deposit and dunes and insight into the evolution of the dunes in the future.

Dating of Dune Deposits

Defining the date in which the Keeler Dunes formed is important in the project since the answer has consequences in terms of who will be required to implement the dust control measures. Due to the potential youth of the dunes and their relative lack of organic matter, it appears that most radiometric age dating techniques are unsuitable.

A dating method that has promise for the sand deposits is an optical luminescence technique that provides an age for the last exposure of the material (quartz and potassium feldspar) to light. Due to the mobility of the aeolian material, most of the sand deposit would show very young ages when dated. However, of interest to this project is to determine the oldest dates present within the Keeler Dune area. The sampling methodology is critical to successful date results and sample collection has to be conducted carefully and with a detailed sampling plan in order to make the dates meaningful.

Two areas were sampled for optical luminescence dating in September 2010 by researchers from DRI and the District. Samples were transported to and are being analyzed by DRI's E.L. Cord Luminescence Geochronology Laboratory in Reno, Nevada. Initial results of the age from one of the samples should be available in early 2011 with the remaining results complete in the summer or fall of 2011. A total of ten samples were collected from the two areas of interest, two from the shoreline dunes and eight from the western portion of the Keeler Dunes.

The first sample area includes aeolian deposits that are covered with discontinuous layers of clays and silts (mudflat deposits). The mudflat layers are thought to have formed from deposition of flash flood material within the dune field. Over the last several years, many of the mudflat areas have become progressively exposed as overlying dune deposits are removed by continued aeolian activity. The mudflats are present at multiple elevations indicating that there have been multiple flooding episodes during the development of the dune deposits.

The areas that contain the mudflats are primarily located along the western edge of the dunes adjacent to large greasewood mounds. The target for sampling was the aeolian sands that were trapped and protected from subsequent movement by the deposition of the overlying mudflat layers. Dates from these buried layers should provide useful information on the age of the sand deposition. An emphasis was placed on sampling from the oldest mudflat deposits. Presumably, these are the mudflats lowest in elevation – however, given the dynamic nature of the landscape over time, a careful evaluation was conducted to survey and correlate the mudflat units prior to conducting the sample collection.

Another area of focus for luminescence dating was the shoreline dunes along the eastern side of the lake bed. It is thought that these dunes could represent part of a stable natural dune system developed along the historic Owens Lake prior to desiccation. If this is the case, then it may be possible to verify this by completing careful sampling and dating of samples from the base of the dunes. Since there is discussion on potentially using the shoreline dunes and Swansea dunes as an analog model for potential control in the Keeler Dunes, the results of age dating of the material present is important.

Historical Records and Anecdotal Information

Another avenue for learning about the formation of the Keeler Dunes and sand deposits is through review of historical records and photos. Development of the eastern side of Owens Lake and the area around Keeler began with mining and railroad activities starting in the late 1800's and early 1900's. The main mining activities included silver mines in the Inyo Mountains, salt mining on Owens Lake and in Saline Valley, dolomite mining in the Inyo Mountains, and talc and clay mining in the Coso Mountains.

A narrow gauge railroad was built around 1900 with the end of the line being in Keeler. Searches through historical records from sources with information from all of these activities are being conducted to see if there are any photos, historical records or anecdotal information on the landscape in the area of the Keeler Dunes.

Projection of Future Movement of Dunes and Sand Deposits

Through analysis on the origin and development of the Keeler Dunes it may be possible to project the movement of the dune deposit with time into the future. Prediction of the future development of the dunes is important in order to determine what will likely happen to the existing landscape should no controls be implemented within the dunes as well as what will happen to the deposit should there only be partial control (i.e., only part of the areas designated for mitigation).

One obvious question to answer concerns the dune encroachment into the community of Keeler. Preliminary estimates suggest that the southern portion of the dune deposit has moved approximately 165 meters to the southeast from 1994 to 2008. This yields an average rate of movement during this time span of about 12 meters per year. If this rate of movement continues, the Keeler Dunes deposit will move into the community of Keeler in about 65 years (Figures 5 and 6).

By completing a more comprehensive evaluation of the complete set of available images a more thorough understanding of the overall distance of movement of the dunes with time as well as the speed at which the dunes have moved. The current assumption is that the sand deposit is moving at a relatively uniform rate, however, this might not be the case. The overall dune movement may well be non-uniform such that it moves in pulses, with each pulse separated by a period of time with little or no movement. Gaining this type of information will be important for understanding the dynamic system and developing predictions of the state of the dune field in the future.

b. <u>Characterization of the Keeler Dunes and Sand Deposit – Data Collection and Analysis</u>

The purpose of the information collected as part of the Keeler Dune sand deposit characterization tasks is to understand the current conditions and to provide information on the processes that formed the dune system.

Sand Motion Monitoring

The District currently has a network of 12 sand motion monitoring sites within the Keeler Dune Sand deposit. The sites within the network are located in three transect that are oriented from northwest to southeast (Figure 1). Instrumentation at the monitoring sites includes:

- Sensit – electronic saltation particle count sensor to time resolve sand motion
- Cox Sand Catcher (CSC) – used to collect a physical sample of the saltation fraction
- Wind speed (WS) sensor – all 12 sites have WS at 1 meter height, 3 sites have WS at 1 and 2 meter height.
- Wind Direction (WD) sensor – at 3 sites
- Campbell Scientific datalogger system

The sites are visited regularly by a field technician to collect the sand catch from the CSCs as well as download data from the logger and to make sure the instrumentation is operating properly. The scheduling of the field visits can range from weekly to monthly and is based on the number and magnitude of wind events. The procedure for operation of each site and the processing of sand catches follows that described in the Dust ID Protocol (GB, 2008b). The sand catch from the site is removed from the field and is taken to the lab in the Keeler office and dried, if necessary, and then weighed on the analytical balance to obtain a mass for the catch. Samples are then placed in labeled zipperlock bags and stored. The sand catch mass data are processed with the time resolved particle count data from the Sensits to provide saltation flux rates for each site.

The 12 existing sand motion monitoring sites (as of June 2010) are installed in open areas within the Keeler Dunes and sand deposit. There can be occasional growth of annual plants following precipitation events but for the most part the sites are located in unvegetated open spaces where there is relatively high sand flux.

Six additional sand motion monitoring sites are proposed for installation in the network. The new sites are proposed for two areas (NW and SE) that are adjacent to the Keeler Dune deposit (Figure 7). The purpose of installing sites in these areas is to monitor the sand motion and wind field associated within what is thought to be relatively stable areas. The results from the sites within the areas with low dust emissions can be used as a natural model and can assist in projecting what the expected sand motion and wind reduction will be in areas of the Keeler Dunes if a replicated system is used as a dust control strategy.

Three sites are proposed NNW of the Keeler Dune sand deposit within the Swansea dunes (Figure 7A). This area consists of a dune field approximately 3-5 meters in height and containing scattered vegetation elements that disrupt the wind. The dominant vegetation consists of large greasewood mounds along with smaller saltbush and other phreatophytic plants. The new monitoring sites will be placed in areas of differing vegetation cover and composition in order to determine the sand flux and wind conditions present. The Swansea dunes sites will be instrumented in a similar fashion to the Keeler Dunes sites except that adjustments will be made to the height of the wind speed and wind direction sensors due to the presence of the surrounding vegetation.

The second set of new monitoring sites will be located in the heavily vegetated area between the south-end of the Keeler Dunes and the community of Keeler (Figure 7B). Again, the purpose of these sites is to determine the movement of sand within an area considered to be stable. The results can be used as a target when selecting a dust control strategy.

Sand Flux Data Analysis

Analysis of the sand flux in conjunction with WS, and WD provide information on the movement of sand across the Keeler monitoring network. Further analysis of these data will be completed as part of an air quality model in order to determine the contribution of each site to dust concentrations at modeled receptors (see Section IV.a.)

Analysis of data from November 2008 to April 2010 (following expansion of the network from 2 to 12 sites) provides preliminary results for the flux rates and direction of sand movement across the monitoring network (GB, 2009a, 2009b and 2010). From these reports it appears that the predominant sand flux within the Keeler Dunes deposit is to the east to southeast directions and that the highest flux rates are found in the western and southern portion of the aeolian deposit (Figure 8).

Additional analysis of sand flux and wind data also provide valuable results regarding the threshold winds needed for particle motion across the network. Data are evaluated by transect as well as location within the network. Results from February 2009 to April 2009 indicate that the threshold WS needed for saltation and saltation rates vary by location within the Keeler Dunes sands. Generally the threshold WS increases and the saltation rates decrease from the west to east (GB, 2009b).

Remote Camera Sites - Video Record During Dust Events

The District has two remote cameras located with vantages over the Keeler Dunes and sand deposit (Figure 3). The first camera (Dolomite 2) is located north of the Keeler Dune area on a hillside along the base of the Inyo Mountains. The current camera operating at the Dolomite location is high definition and has a resolution of 920x1080. The view from the Dolomite 2 camera is to the southeast with the main axis of aeolian activity in the dunes visible. The second camera (Keeler Dunes camera) is located northeast of the Keeler Dunes on a hill at the top of the Keeler Fan. This camera has a view to the west-southwest across the Keeler Fan toward the lake bed. The Keeler Dunes camera has a resolution of 640x480.

The cameras collect images continuously during daylight hours and transmit them to the District's Keeler field office through a remote transmission system. Processing of the camera footage is conducted regularly to remove periods of time without dust activity. The images with "dusty" days are complied and provide a useful visual summary of the location and intensity of dust events in the project area. An analysis of the video information in conjunction with the sand motion and wind data will be completed for selected dust storms so that the magnitude and intensity of the dust event can be compared with the visually observed activity.

Photo Record from Monitoring Sites

One of the tasks during each visit to the sand motion monitoring sites is to obtain photographs of the conditions in the area where the instrumentation is located. The purpose is to provide a record of the general conditions at the site. Important features that can be present on the photos include some of the following:

1) the presence (or absence) of annual vegetation growth
2) height of annual vegetation
3) density of annual vegetation
4) movement of sand sheets and sand tongues across the area
5) areas of inflation or deflation
6) scouring of the surface
7) movement of nearby dune forms
8) moisture from recent rains
9) other features that may influence the local sand movement near the site.

The photographs are downloaded and stored onto a computer following completion of the site visits within the network. Photographs are always taken from the same location (marked with a stake in the field) and orientation so that the fields of view of the photos are consistent over time.

c. Characterization of the Keeler Dune and Sand Deposit – Mapping and Survey Data

The conditions and nature of the Keeler sand deposit is obtained through characterization efforts that involve sample collection and analysis and mapping and surveying in the project area.

Particle Size Analyses

Analysis of the particle size distribution is a common technique used to characterize a soil or sediment sample. Typical particle size analyses provide information on the percentage of material within specified size ranges. By completing analyses on samples collected across an area it is possible to determine spatial changes in the particle size distribution across a deposit which in turn can provide useful information on their formation and development.

Numerous samples from Owens Lake and from the Keeler Dunes sands have been analyzed for their particle size distribution. The samples analyzed from the Keeler Dunes include sites from aeolian deposits at the surface as well as from material collected in the CSC devices. These samples were analyzed using a dry sieve method to provide data in 7 particle size bins. The results of the analyses show an overall decrease in particle size distribution from northwest to southeast and from west to east across the Keeler Dune sand deposit consistent with visual observations (Figure 9).

As part of work on the lake bed before the implementation of dust controls, soil samples were collected and analyzed for general particle size character during soil surveys as well as from early sand transport studies. During these projects, several samples were collected from the NSS area from the surface as well as down to 5-feet below surface in the soil profile. Additionally, a few of the catches from early sand transport studies were also analyzed. The method for analysis of the soil survey samples used the hydrometer method to aid in soil classification. Samples from the sand transport study were analyzed with the dry sieve method.

The soil on the NSS before dust control implementation contained a distinct lag deposit at the surface caused by the winnowing of finer grained material through continual aeolian activity. The lag deposit was composed of fine gravels and coarse grained sands with a thickness on the order of several centimeters. (Note: the lag deposit is no longer present due to the leveling and working of the areas during dust control construction and operations.) A careful review of the available soil data will be conducted to determine the estimated volume of material that was removed from the NSS through aeolian processes.

Mapping

Mapping is important for understanding the relationship of some of the visible features within the Keeler Dune area. Mapping efforts can be grouped into the following categories: sand movement, vegetation, mudflats, edges of dune forms, and changes in dune shape and volume. Methods for completion of mapping efforts range from analysis of air photos and high resolution satellite imagery, to use of a global position system (GPS) to delineate individual features and polygons, to surveying of transects with optical survey equipment.

By using the library of satellite imagery and air photos (see Section III.a.) the changes in large-scale features can de determined to help understand the historical development of the dune deposit. Mapping of bulk vegetation changes may also be determined by interpreting the available collection of photos and images. Also useful in characterizing the dune area is on-the-ground mapping of select features, such as the position of dune faces and dune boundaries, location and size of exposed mud-flat areas, and natural vegetation areas. In many cases, the on-the-ground mapping episodes provide excellent control for interpretation of imagery.

The deposits of clay and silt that form the cracked mudflat areas have changed significantly over time. Many of the mudflats present along the western portion of the dune field have become more exposed through deflation of the overlying sands. By mapping the size of the exposed mudflat areas using the satellite and air photo record it may be possible to develop an estimate of the rate of deflation and the volume of material that has been lost (Figure 10).

In order to accurately map the size and location of the existing dune field, the District conducted GPS mapping of the dune forms in 2002, 2008, 2009, and 2010 (Figure 11). Mapping is completed by traveling (via ATV in 2002 and via walking in 2008, 2009 and 2010) around the base of the dune forms to provide a polygon map of the outline of individual dunes. This mapping effort provides control for the interpretation of images in the library as well as further information on small-scale features of the dune that might not be visible on images and photos. Dune mapping will continue in the late spring to early summer of 2011 and will be used in conjunction with other data to provide an understanding of the movement of the dunes over time.

HydroBio INC has completed two high resolution air photo mosaics of the Keeler Dune area. The first was conducted in August and October of 2009 and the second in August 2010. Both sets of photo mosaics have been rectified and added to the photo/imagery library. From the 2009 mosaic, a map of the existing vegetation was created. This map will be used to determine the vegetation cover present within the dune area. Most of the active areas of the dunes are open and have very little vegetation. Use of this cover data combined with sand flux information will be used in the consideration of dust control methods for the dunes. The photos from August 2010 have been especially useful in conducting mapping and surveying efforts within the project area since small features (e.g. individual shrubs and plants) are easily visible.

Elevation Surveying

Elevation surveying within the Keeler Dunes is limited. HydroBio has established a series of transects across five of the dune features present in the deposit and has conducted two annual relative elevation surveys (the survey transects are not tied to absolute elevation above MSL) (HydroBio, 2009). The first survey was in 2008 and established the initial conditions across the five surveyed dunes. The second survey was completed in 2009. A third survey of will be conducted in October 2010. Data from the transect surveys will provide profiles across the dunes and an estimate of the volume changes present on an annual basis. (The reader is encouraged to read the report by HydroBio (2009) for more information on the survey and results of the work to date.)

In January 2010, the LADWP completed an air-borne LIDAR survey of portions the dust control project on the bed of Owens Lake. Fortunately, the Keeler Dunes area was included within the survey area and the data have been made available to the District. These data provide a detailed digital elevation model (DEM) of the Keeler Dunes and related sand deposit area and can be used in combination with other information to develop a sand budget and volume estimate for the project.

V. Development of Control Strategy

a. Air Quality Modeling

An air quality model will be used to help identify air pollution sources within the Keeler Dunes that contribute to PM10 violations in the community of Keeler and to evaluate control strategies to bring the area into attainment. The CALPUFF modeling system will be used as described in the 2008 SIP (GBUAPCD, 2008a) but with some modifications and refinements.

The model is an important tool that is used to help quantify the PM10 impacts caused by dust sources on the bed of Owens Lake and within the Keeler Dunes deposit. The sources of input into the model come primarily from the data collected within the dunes and the community of Keeler and include:

> Sand Flux Data: Collected from co-located Sensit and CSC sites. The total mass of saltating particles at the site is measured from the sand catches from the CSC. The Sensit data allows the horizontal sand flux to be time resolved for input into the model. The relationship between the sand flux and monitored PM10 concentrations (K-Factor) allow for the data to be converted to PM10 emissions for the model.
>
> Meteorological Data: The meteorological data from the CSC/Sensit monitoring sites within the Keeler Dunes network as well as from the Keeler meteorological tower will be used for wind speed and wind direction inputs into the model.
>
> PM10 Data: Hourly data from the TEOM PM10 monitor at the Keeler Air Monitoring Station will be used for dust concentration input in the model.
>
> Source Area Locations: The source area configuration for the CALPUFF model will be largely developed by combining observational dust mapping and from review of the footage from the two camera sites with vantage over the Keeler Dunes. However, landscape features such as dune form locations, vegetation, sand sheet presence, and other factors from on the ground mapping and observations will also be considered.

In the modeling analysis, emissions from individual dust source areas are simulated to assess whether they caused or contributed to an exceedance of the PM10 standard. Each control measure design and overall implementation strategy will be evaluated in the model to determine the effectiveness at reducing the PM10 emissions from the Keeler Dunes.

b. Control Area

It is generally known from previous results of air quality modeling through the Dust ID Program which areas within the Keeler Dunes need to be controlled. However, the results are generalized and may include portions of the sand deposit that have lower emissions and/or that may not need any or as much control.

Due to the scale of the dust sources on the lake bed, the current air quality model for Owens Lake uses source area contributions that have been descretized into blocks that range from 125 meters to 250 meters on a side. The Keeler Dune area is much smaller than the dust source area modeled on the lake bed (1.3 square miles versus approximately 50 square miles) such that the individual source contribution areas potentially can be smaller within the dune area allowing for more detail, where needed.

The air quality model for the control measure strategy developed for the Keeler Dunes will refine the existing model by focusing on the dune area and using a wide variety of input data from detailed monitoring. The areas that need to be controlled to reduce the PM10 concentrations in the community of Keeler will be determined through a combination of modeling, mapping, video and knowledge of features and terrain within the project area.

c. Control Method Ideas

There are a variety of control measure options for the Keeler Dunes. The strategy that is adopted and implemented will have to take into account the various needs of the different parties with jurisdiction in the control area and with interests in the future of the dune area. The District is required by government regulations to approve and order for implementation a control strategy that will reduce the PM10 emissions that impact the community of Keeler to a level below the standard.

The list of potential control measures range from a completely engineered solution that uses more of a brute force technique to one that leaves the area in as natural state as possible but at the same time is effective at controlling dust emissions. The most effective methods for control of dust emissions will utilize the data and knowledge obtained through other aspects of the project on the processes within the dune system. The final control strategy will have to be carefully crafted and will be selected taking the dust control effectiveness, natural and cultural resources, environmental impacts, technological feasibility and other factors into consideration.

VI. Project Timeline

Due to the proximity to the community of Keeler, dust emissions from the Keeler Dunes contribute significantly to exceedances of the federal PM10 standard in the community. After all the lake bed sources are controlled, the Keeler Dunes area is expected to be the main remaining dust source that cause exceedances of the standard in the planning area. The District will work with the City of Los Angeles and other federal, state and local agencies to develop a plan to control dust emissions from the Keeler Dunes. PM10 control measures required for the Keeler Dunes will be ordered by the District before January 1, 2012 and implemented by the responsible parties before January 1, 2014 in order to demonstrate attainment of the federal standard by 2017.

a. Control Strategy

The development of a successful dust control strategy for the Keeler Dunes and related sand deposits will involve collaboration between multiple government agencies and interested local parties. The existing natural and cultural resources present within the dunes are important considerations in the development of the control plan. Of particular concern to the BLM and local Native American Tribes is the presence of cultural sites within the dunes. It is important to develop a control plan that protects and preserves these sites as much as possible.

The Keeler Dunes are a unique place that is enjoyed by many of the residents from the local community for non-motorized recreational activities (the dunes have been closed to motorized traffic since 2005).

The folks that frequent the dunes have expressed a strong desire to preserve the existing dune area as much as possible. In order to get support from local residents for control of the dust emissions from the dunes, it will be important to develop a control strategy that takes into serious consideration and incorporates as much as possible the current usage of the dunes.

To meet the ultimate timeline for the project of attainment of the PM10 standard by 2017 a control strategy for the Keeler Dunes needs to be developed by January 2011. Once the control strategy is developed then an environmental analysis of its impacts can be determined.

b. Environmental Analysis and Board Order

A thorough environmental analysis of the proposed dust control project is required prior to implementation. The environmental analysis will have to meet the requirements of CEQA as well as NEPA, due to the location of most of the Keeler Dunes on federal lands, requiring a combined Environmental Impact Report (EIR) and an Environmental Impact Statement (EIS). Impacts to Biology, Geology, Hydrology, Cultural Resources, Land Use, Transportation, Air Quality, Visual Appearance and other fields will be evaluated as they relate to the proposed dust control strategy. The environmental analysis needs to be complete and ready for adoption by the responsible agencies by January 2012 so that an order by the Great Basin Unified Air Pollution Control Board may be issued for control of the dunes.

c. Implementation and Attainment of the PM10 Standard

Three years of clean air quality data are required in order for the EPA to designate the Owens Valley Planning Area as in attainment of the PM10 standard. Federal regulations require that the area be in attainment of the PM10 standard by 2017. Thus the party(ies) responsible for implementation of the dust control project in the Keeler Dunes must have all controls constructed and fully operational by January 2014.

VII. References

Great Basin Unified Air Pollution Control District, 2008a, 2008 Owens Valley PM10 Planning area Demonstration of Attainment State Implementation Plan, Great Basin Unified Air Pollution Control District, Bishop, CA, January 28, 2008.

Great Basin Unified Air Pollution Control District, 2008b, 2008 Owens Lake Dust Source Identification Program Protocol, Great Basin Unified Air Pollution Control District, Bishop, CA, 2008. (reference is also available as *Attachment C* in *2008 Owens Valley PM10 Planning area Demonstration of Attainment State Implementation Plan,* GBUAPCD 2008a)

Great Basin Unified Air Pollution Control District, 2009a, Memorandum by D. Ono titled "Preliminary Keeler Dune Sand Motion Results (Nov 2008 – Jan 2009)", May 4, 2009.

Great Basin Unified Air Pollution Control District, 2009b, Memorandum by D. Ono, "Sand Motion In Keeler Dunes (Feb-Apr 2009)", June 2009.

Great Basin Unified Air Pollution Control District, 2010, Memorandum by P. Kiddoo titled "Keeler Sand Dune Flux Analysis", May 2010.

HydroBio, 2009, Preliminary Assessment of Dune Movement, and Factors Influencing Air Quality and Potential Mitigation Near Keeler, California, report prepared for the Great Basin Unified Air Pollution Control District, April 16, 2009.

Lancaster, Nicolas, 2010, Year-end Progress Report, Keeler Dunes Investigation, in preparation.

VIII. Figures

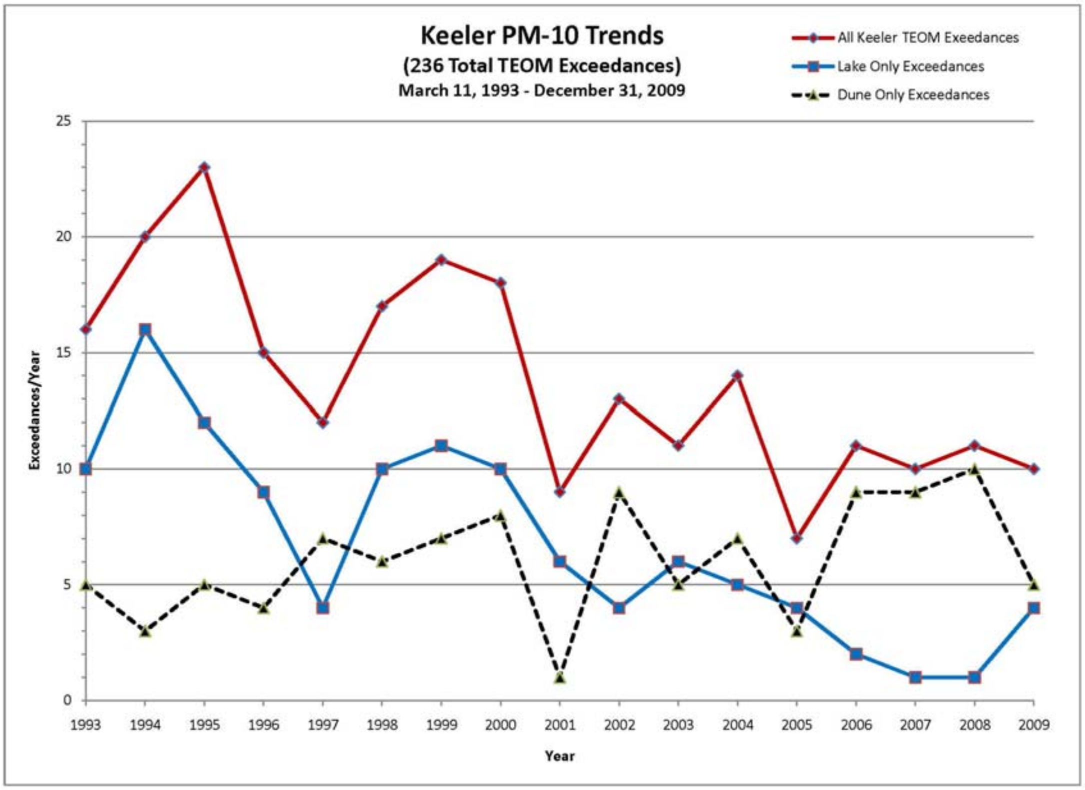

Figure 1. PM10 concentrations measured at the Keeler air quality monitoring station from 1993 to 2009.

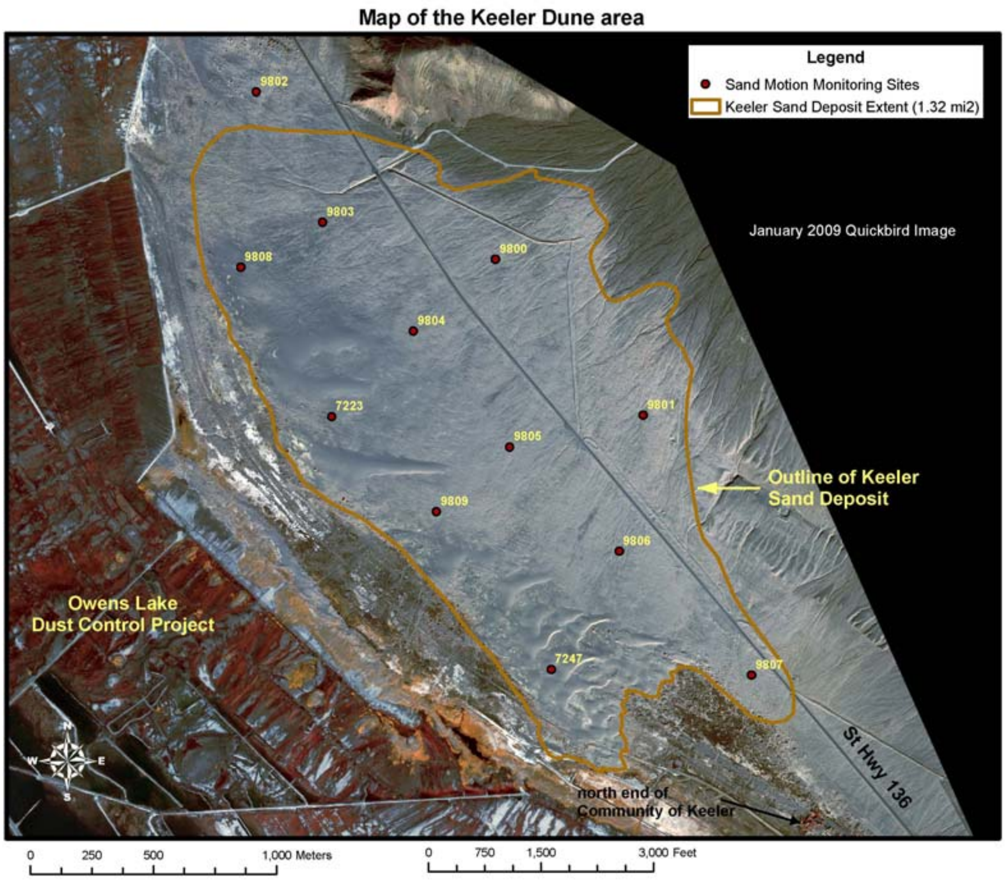

Figure 2. Map of the Keeler Dune area showing the approximate extent of the Keeler Dune sand deposit and sand motion monitoring sites (CSC/Sensit sites).

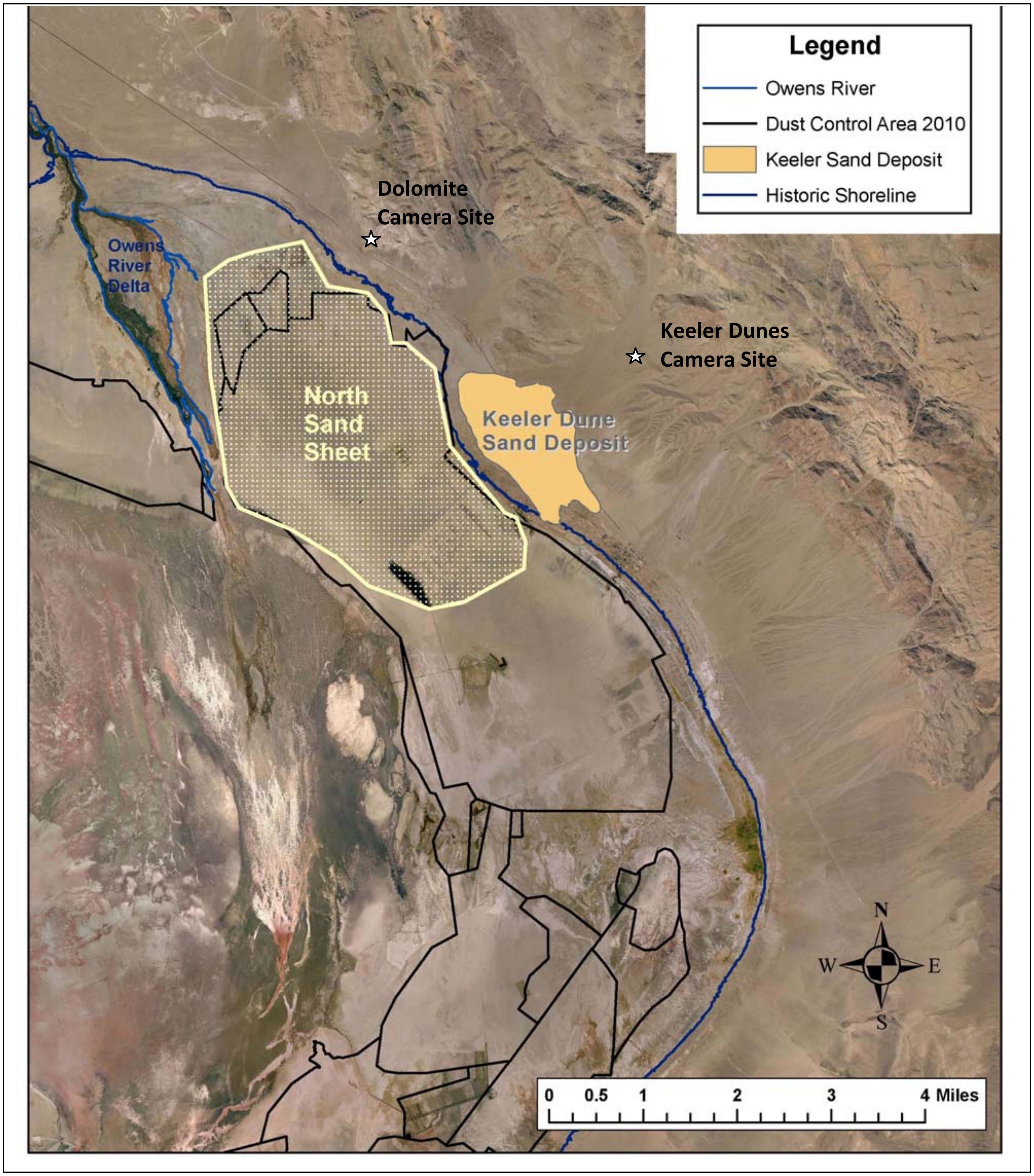

Figure 3. Map of the northeastern portion of Owens Lake showing the location of the North Sand Sheet (NSS) and the Owens River in relation to the Keeler Dune sand deposit. Background air photo was taken in September 2000 prior to dust control project construction. Dust control project footprint from 2010 is shown for reference. Also shown on the map are the locations of the two camera sites which overlook the Keeler Dunes (white stars).

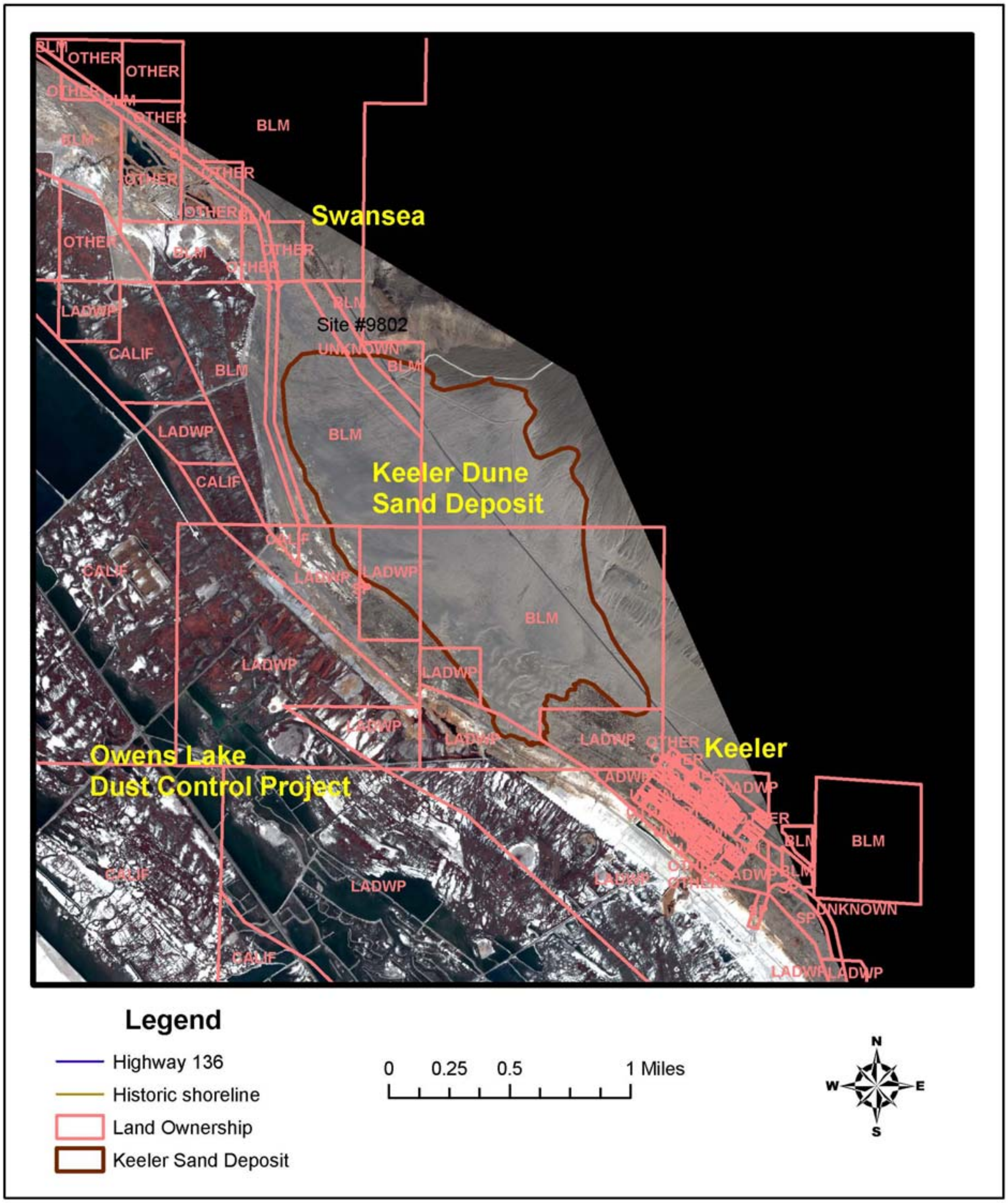

Figure 4. Map of the Keeler Dune area showing land ownership.

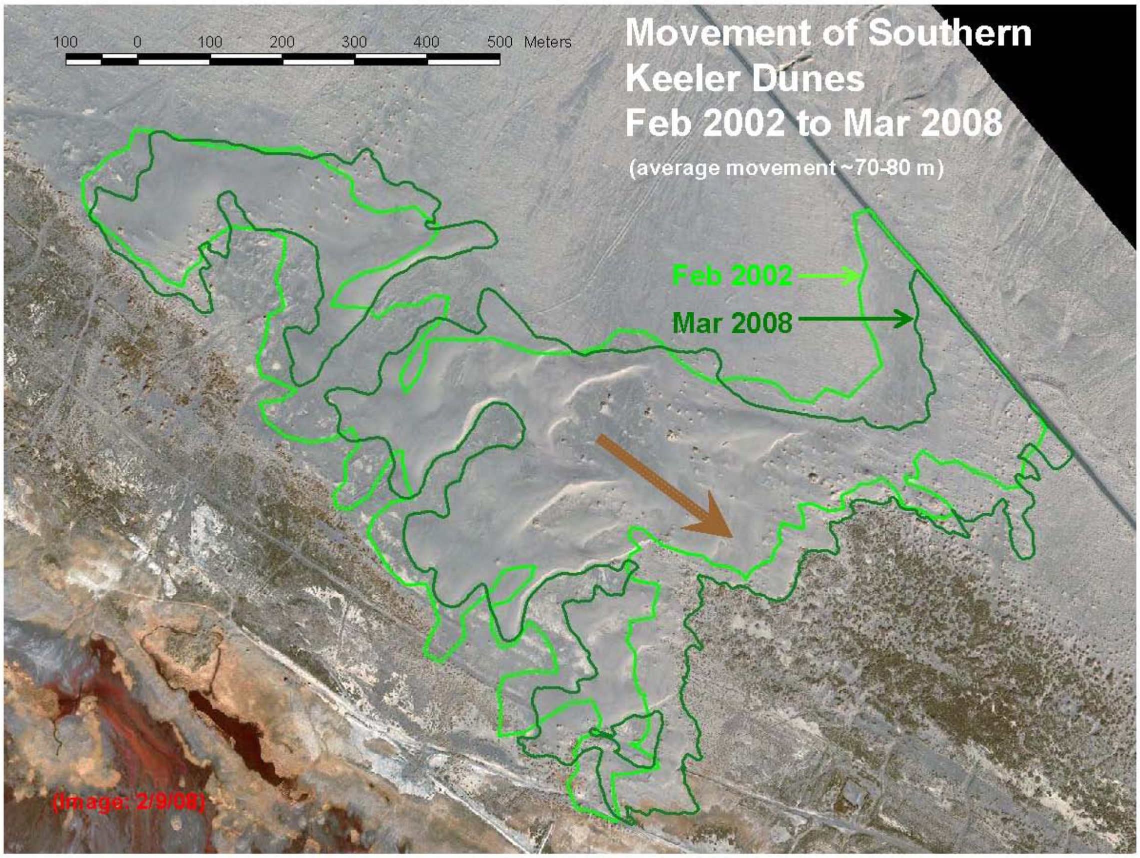

Figure 5. Map of the southern portion of the Keeler Dunes showing the movement from February 2002 to March 2008.

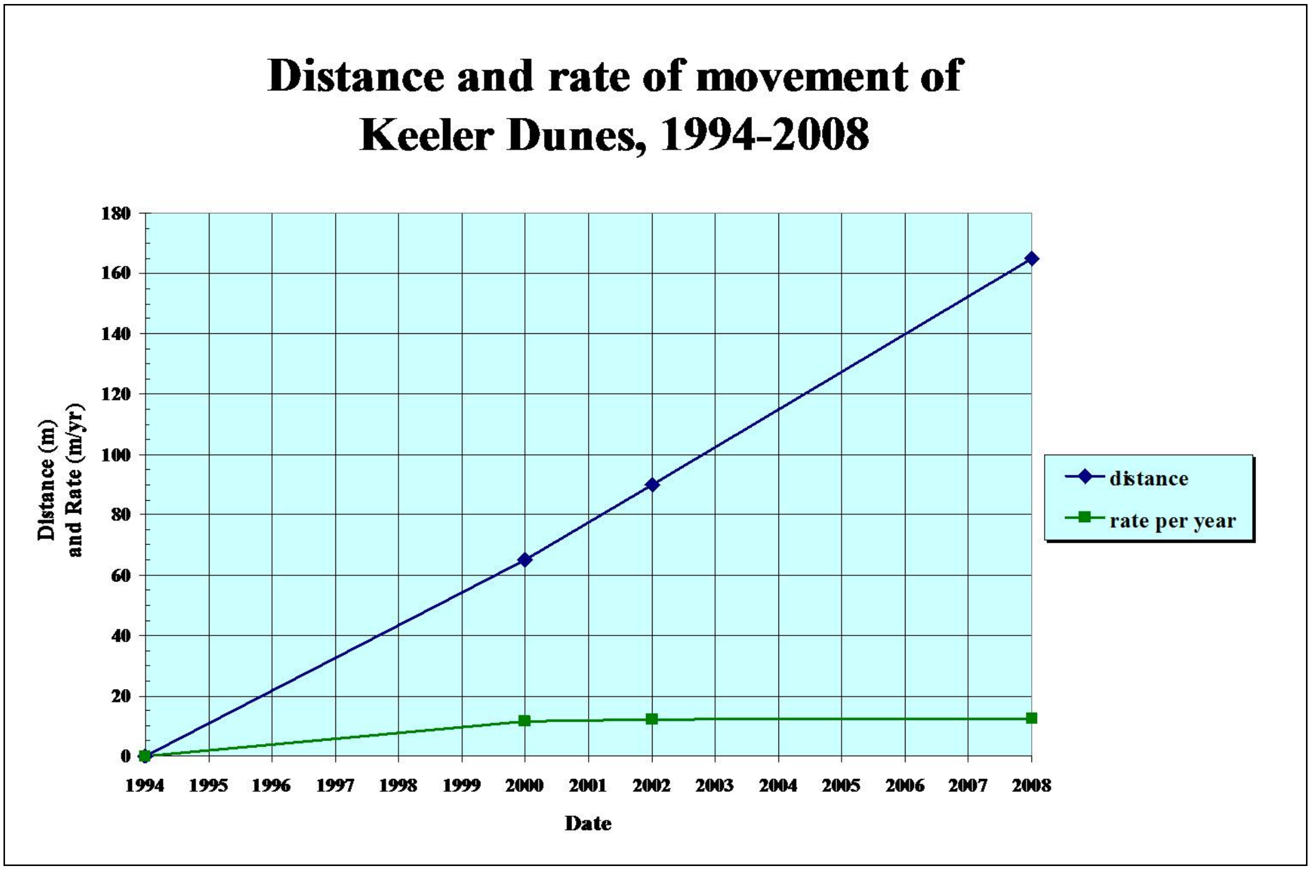

Figure 6. Graph showing the distance and rate of movement of the southern front of the Keeler Dunes from 1994 to 2008. Distance and rate of movement were determined from GPS mapping and satellite imagery interpretation of where the sand deposit covers the Old State Highway. The southern edge of the dune deposit has moved about 165 meters toward the southeast over this time period with an average rate of approximately 12 meters per year.

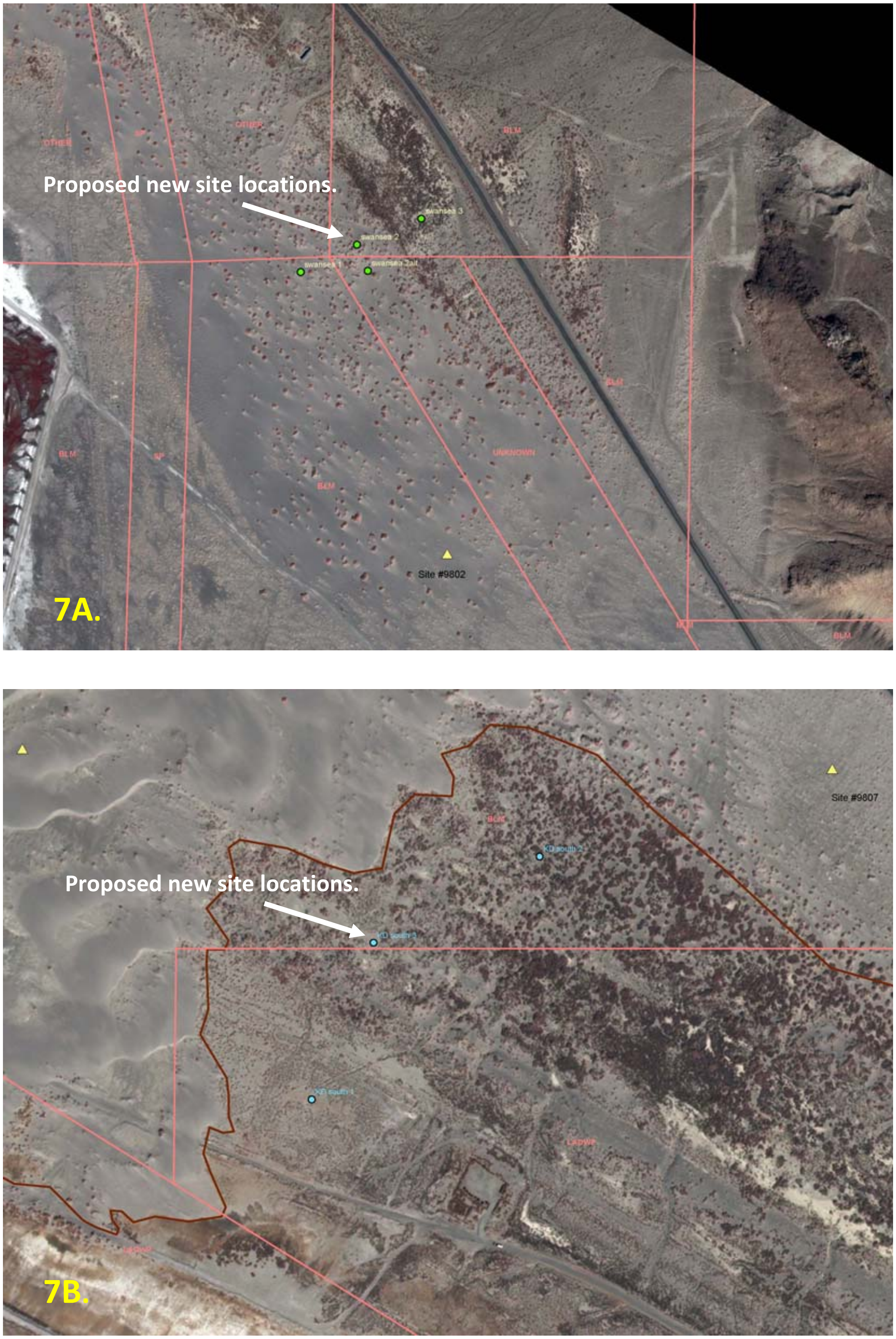

Figure 7. A.) Top Image – Map of the proposed new monitoring locations (green dots) within the Swansea Dunes. B.) Bottom Image – Map of the proposed new monitoring sites (blue dots) along the southeastern edge of the Keeler Dunes. Pink lines are property boundaries.

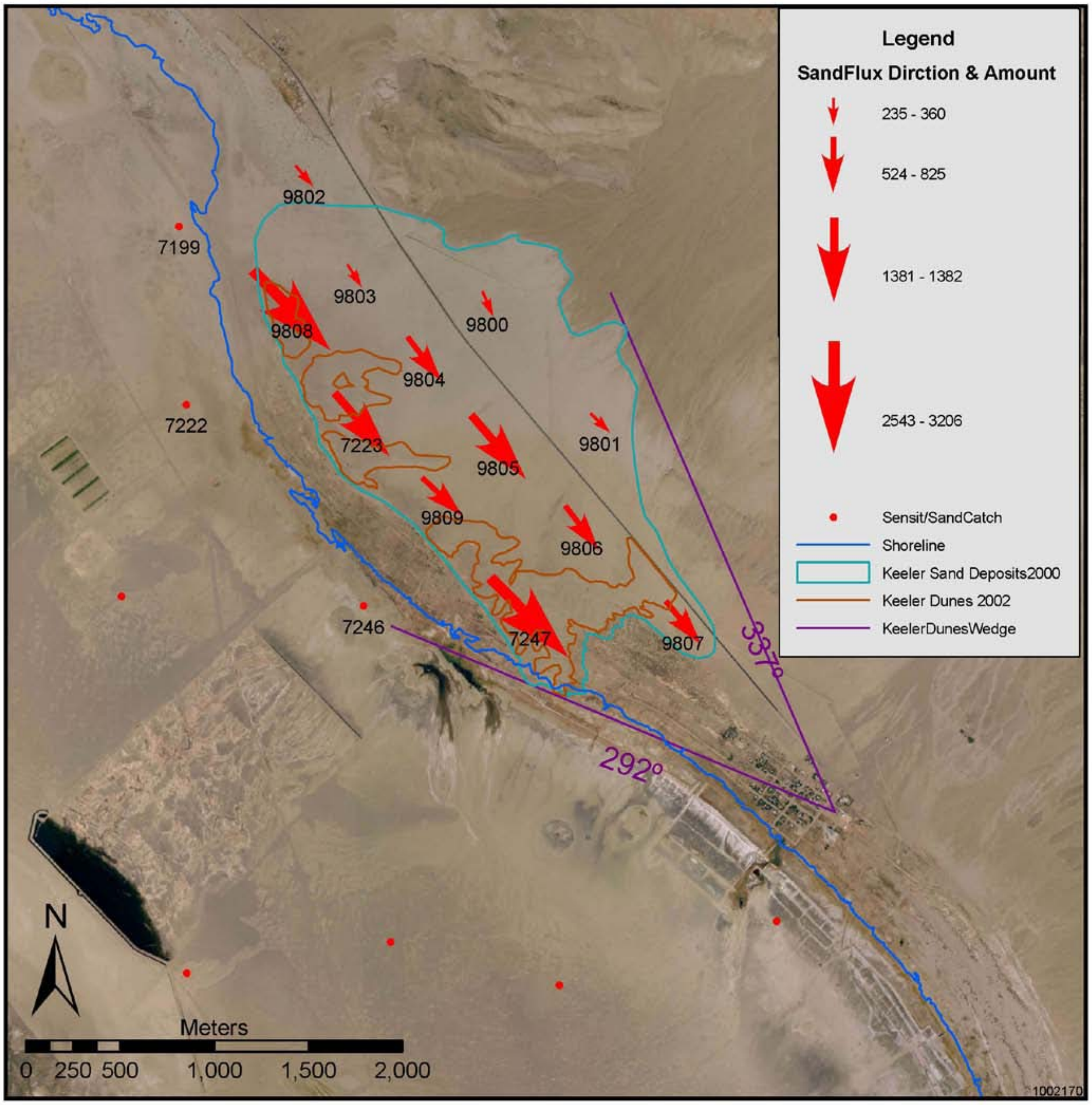

Figure 8. Map of the Keeler Dune sand deposit showing the net sand flux direction and sand flux amount (g/cm^2) as measured at the sand motion monitoring sites from November 2008 to April 2010 (Figure 9 from GB, 2010). Background image is from September 2000.

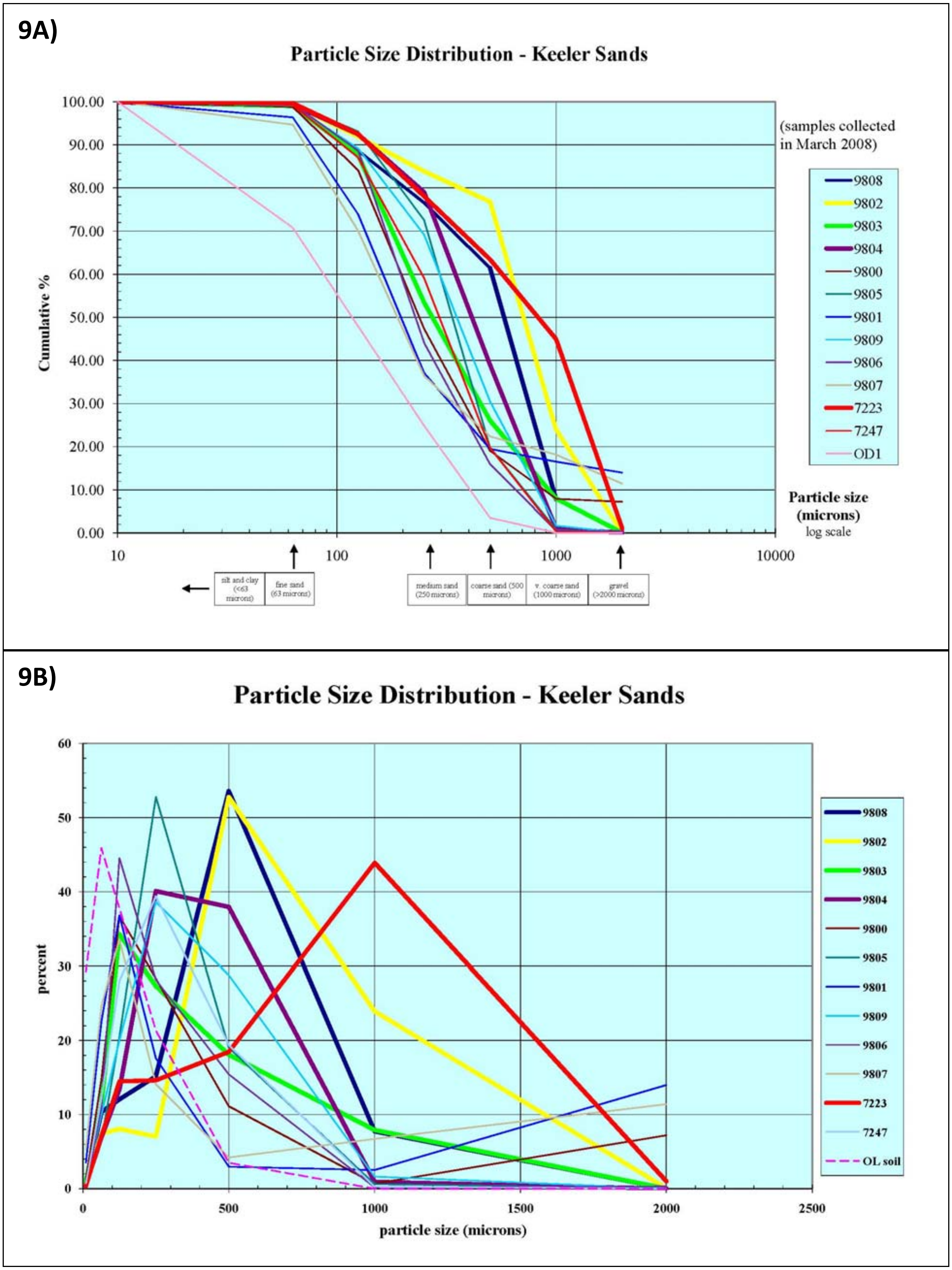

Figure 9. Particle size distribution plots from aeolian deposits collected in March 2008. Notice a general decrease in particle size from north to south and west to east across the study area. Refer to Figure 2 for monitoring site numbers.

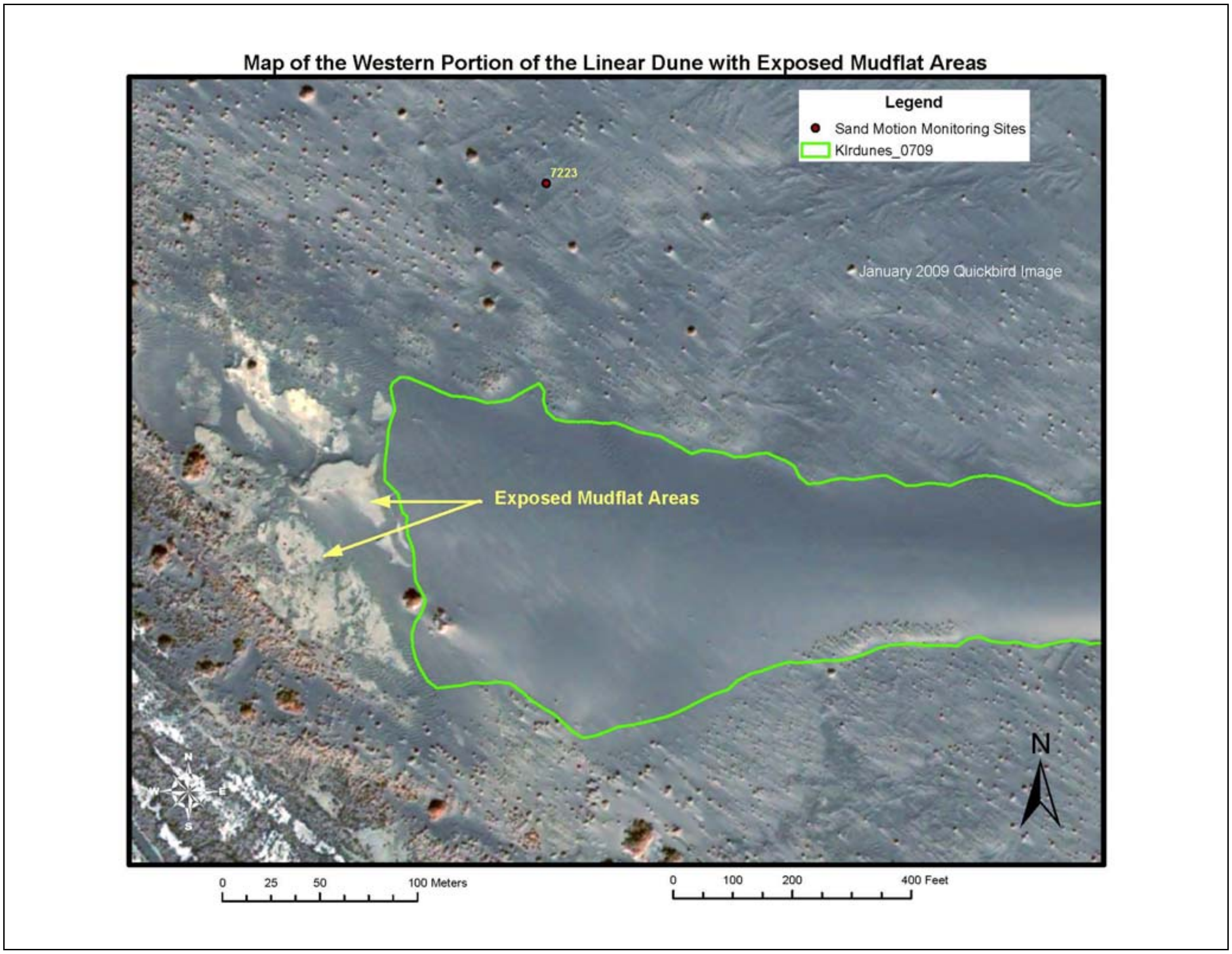

Figure 10. Map of a portion of the linear dune near site 7223 showing the exposed mudflat areas along the western edge.

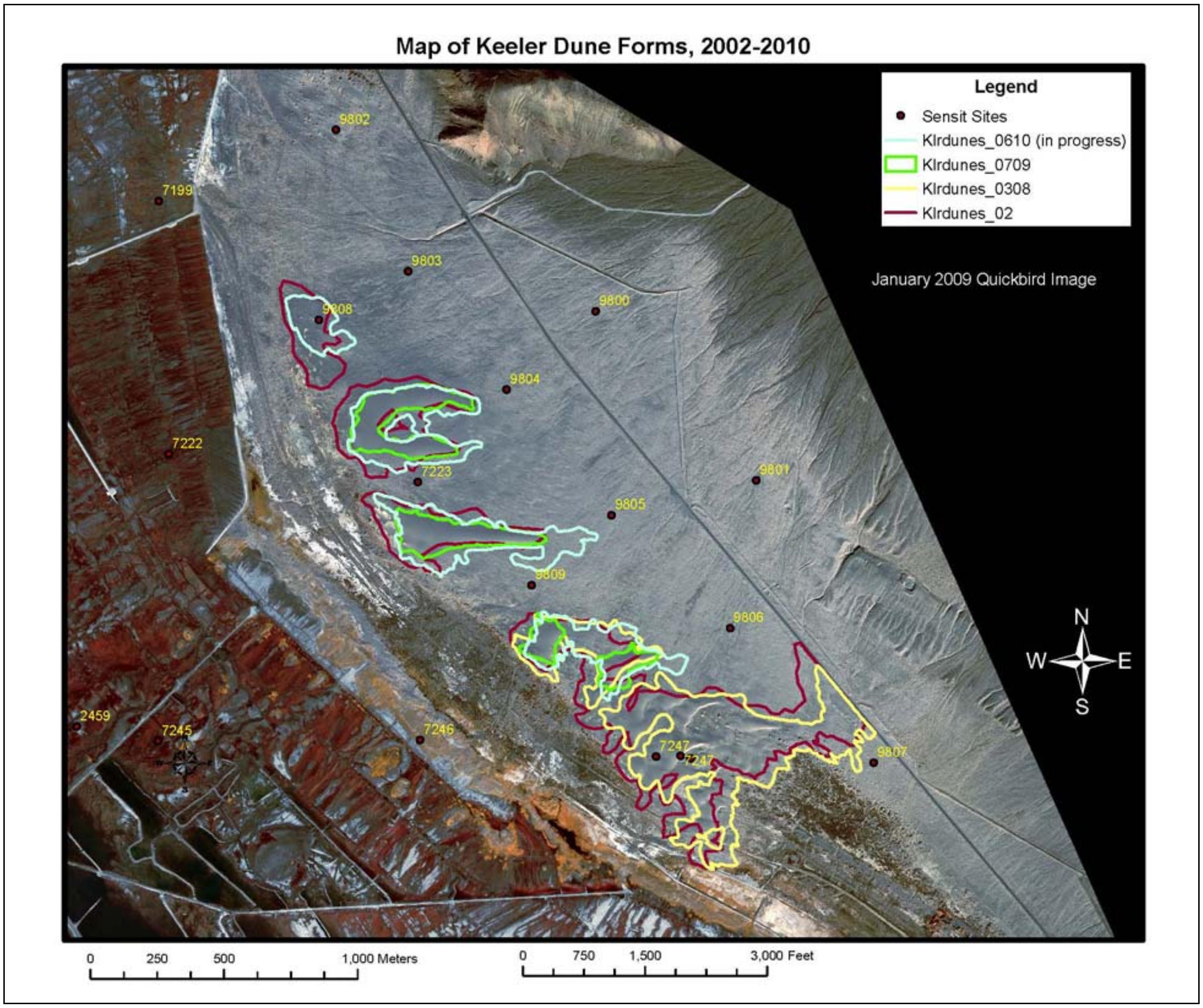

Figure 11. Map of the project area showing locations of distinct dune forms from 2002 to 2010 mapped via GPS. Mapping of the 2010 locations (light blue) are in progress.

APPENDIX J
KEELER DUNES PROJECT
IRRIGATION SYSTEM ANALYSIS

Keeler Dunes Project Irrigation System Analysis

Revised Draft

(with the Irrigation Supply from the East)

2/3/2014

An important component of successful establishment of native shrubs in the Keeler Dunes is providing water when the shrubs are planted and also providing supplemental water during the critical first three years of plant growth and development. The original project description for the Keeler Dunes Project calls for the initial watering as well as the supplemental watering events to be conducted by hand by means of hauling water into the project area via small ATV trailer mounted water tanks (~150 - 200 gallon). This is the irrigation method currently being used to provide water to the shrubs planted on the straw bale demonstration pilot project in the northern portion of the dunes. However, given the size of the project (over 123,000 bales need to be watered), the time and manpower requirements of conducting each watering event, and the potential impact from the required travel, the District feels that consideration needs to be given for use of a temporary irrigation system to improve efficiency and success of the project.

This document is a comparative analysis of three irrigation options for watering the shrubs in the Keeler Dunes dust control project. In this analysis a comparison of the amount of travel in the project, the amount of pipe required and the length of time required to water all of the plants will be completed. The first irrigation option consists of a hand watering system with water hauled into the dunes in small water tanks mounted on ATV trailers. The other irrigation options include the use of a temporary above ground irrigation system either across the entire project or only in areas without sensitive environmental resources. Common to all three irrigation options is the source of the water (Fault Test Well) and the method of transporting the water from the source to the project area (water trucks). The difference between the irrigation alternatives is how the water is delivered within the project area. Each irrigation option is summarized below.

Option 1. Hand Watering. The first irrigation option is simplest in terms of the infrastructure required – watering all of the plants by hand. Water obtained from the Fault Test Well would be transported to the staging areas along the Old State Highway via large water trucks. Water would then be transported to the project via small water tanks mounted on ATV trailers and water would be provided to each plant through a small hose. This option involves the highest amount of travel in the project.

Option 2. Mix of Hand Watering and Watering through a Temporary System. Water obtained from the Fault Test Well would be transported to the project via large water trucks which would connect to the water delivery system from turnouts off of State Highway 136. In sensitive areas, watering will be conducted by hand as in Option 1. Other portions of the project will have a temporary irrigation system installed as in Option 3. The ATV mounted tanks would be filled with water from the delivery system within the project. This option allows for a decrease in potential impacts to sensitive areas within the dunes. This option can be scaled up or down, as necessary.

Option 3. Temporary Irrigation System. This option provides for supplying the water for irrigation to the project through a system of small diameter above ground pipe lines. Water obtained from the Fault Test Well would be transported to the project via large water trucks which would connect to the water delivery system from turnouts off of State Highway 136. The water from the distribution system will be delivered to the plant locations through detachable hoses. This option includes travel into the project area by ATV to the hose attachment points. Watering of individual plants will be conducted by a worker on foot. This option involves the least amount of travel in the dunes.

Components of Irrigation Methods:

Table 1 provides a comparison of the main elements required for each of the three analyzed irrigation options. A description of each irrigation element is provided below. Maps for the infrastructure needed for irrigation Options 2 and 3 are provided in Figures 1 and 2, respectively.

Table 1: Component elements of irrigation system options.

Element	**Option 1** Hand Watering Method	**Option 2** Temporary System with partial Hand Watering	**Option 3** Temporary System
Water Truck at staging areas	X	-	-
Water truck at turnouts along SR 136	-	X	X
ATV with trailer mounted small-water tank	X	X	-
Trunk line (4-6" diameter)	-	X	X
Transmission line (4" diameter)	-	X	X
Distribution line (2" diameter)	-	X	X
Hose attachments	-	X	X

Water Trucks: Water trucks would be used to haul water from the District's Fault Test Well to designated locations where they would serve the purpose of providing water storage. The water trucks would have a hauling capacity of ~8,000 gallons. For Options 2 and 3 in which the water delivery to the irrigation system is from the east along SR 136, the trucks would only be parked at the designated delivery points (turnouts) during times of active watering. Three turnouts would be established along the west side of SR 136 for water truck parking. For the hand watering option (Option 1), the water trucks would park at the three staging areas along the Old State Highway during the day during times of active watering. For all three irrigation options, the water trucks would be parked off-site at night and on weekends, probably at the Fault Test Well site.

<u>ATV with trailer mounted small water tank:</u> This is the system used for hauling water to the current straw bale demonstration pilot project. A small water tank with a capacity of hauling ~150-200 gallons of water is mounted on a small trailer and pulled behind an ATV. Water delivery on the project site is conducted by use of a small booster pump to pressurize a 1-inch diameter fire-hose.

<u>Trunk line:</u> The trunk lines would be 4-6 inches in diameter and transport water from each of the designated water delivery turnouts along SR 136 to the distribution system in the project area. The trunk lines will be made out of rigid PVC and would be above ground.

<u>Transmission line:</u> The transmission lines will be rigid 4-inch diameter PVC pipes that convey water from the trunk lines to the smaller distribution lines (laterals). Where possible the transmission lines will follow the designated access route used for project construction.

<u>Distribution line:</u> The distribution lines (or laterals) will transport water across the project area and will be spaced 150 feet apart. Distribution lines will be above ground and made of rigid 2-inch PVC pipe.

<u>Hose Attachments</u>: Hose attachments will be placed every 150 feet along the length of the distribution lines. During active irrigation, workers on ATVs with hoses on reels will move along the irrigation laterals, attaching the hose and irrigating the plants within reach of that hose attachment (a maximum of ~75 feet away). The hose will then be detached, reeled up, and moved to the next attachment site. All travel associated with irrigation will be along the designated access routes and lateral lines.

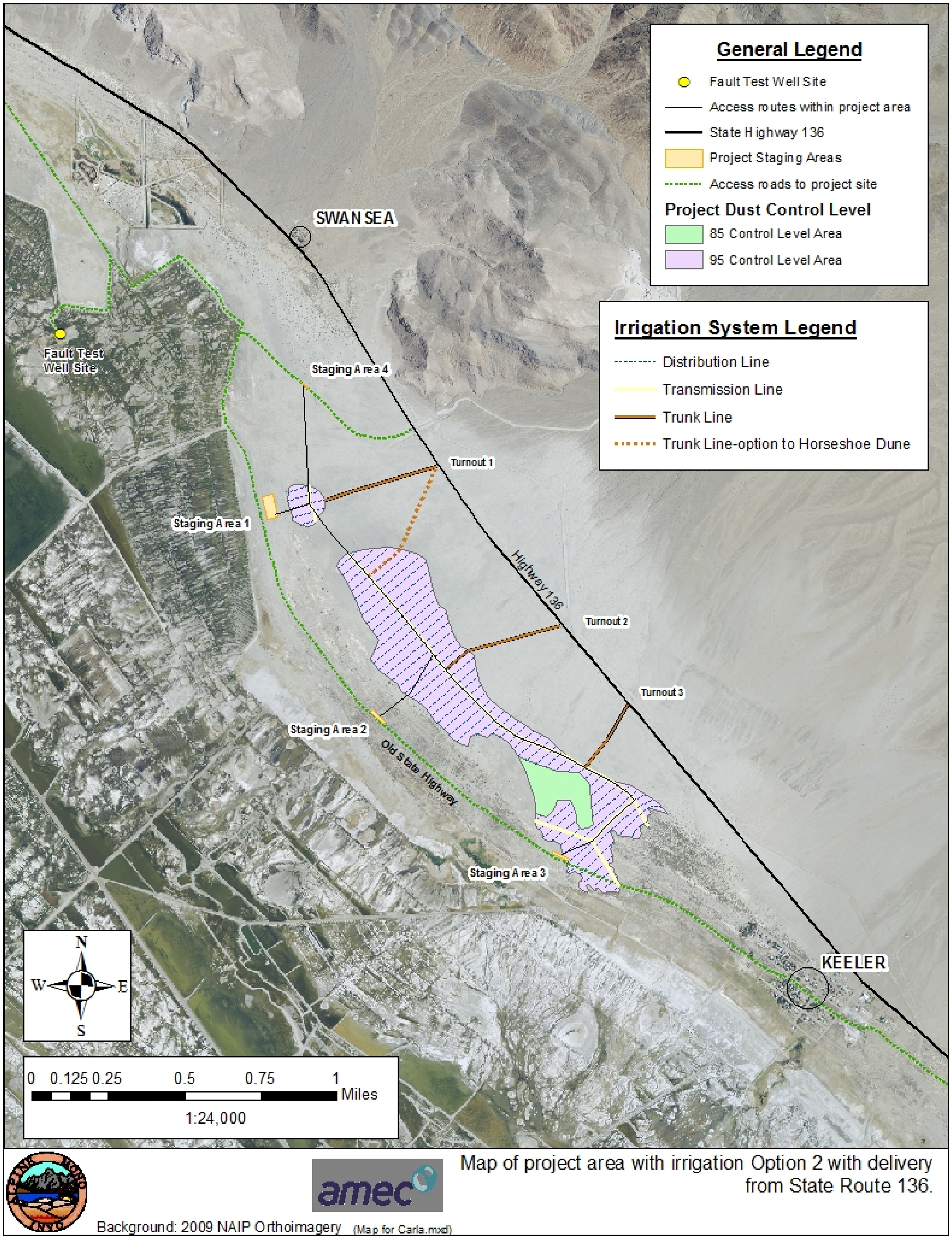

Figure 1. Map of irrigation Option 2. The 85% control level area would be irrigated by hand while the remaining portion of the project would be watered with a temporary irrigation system.

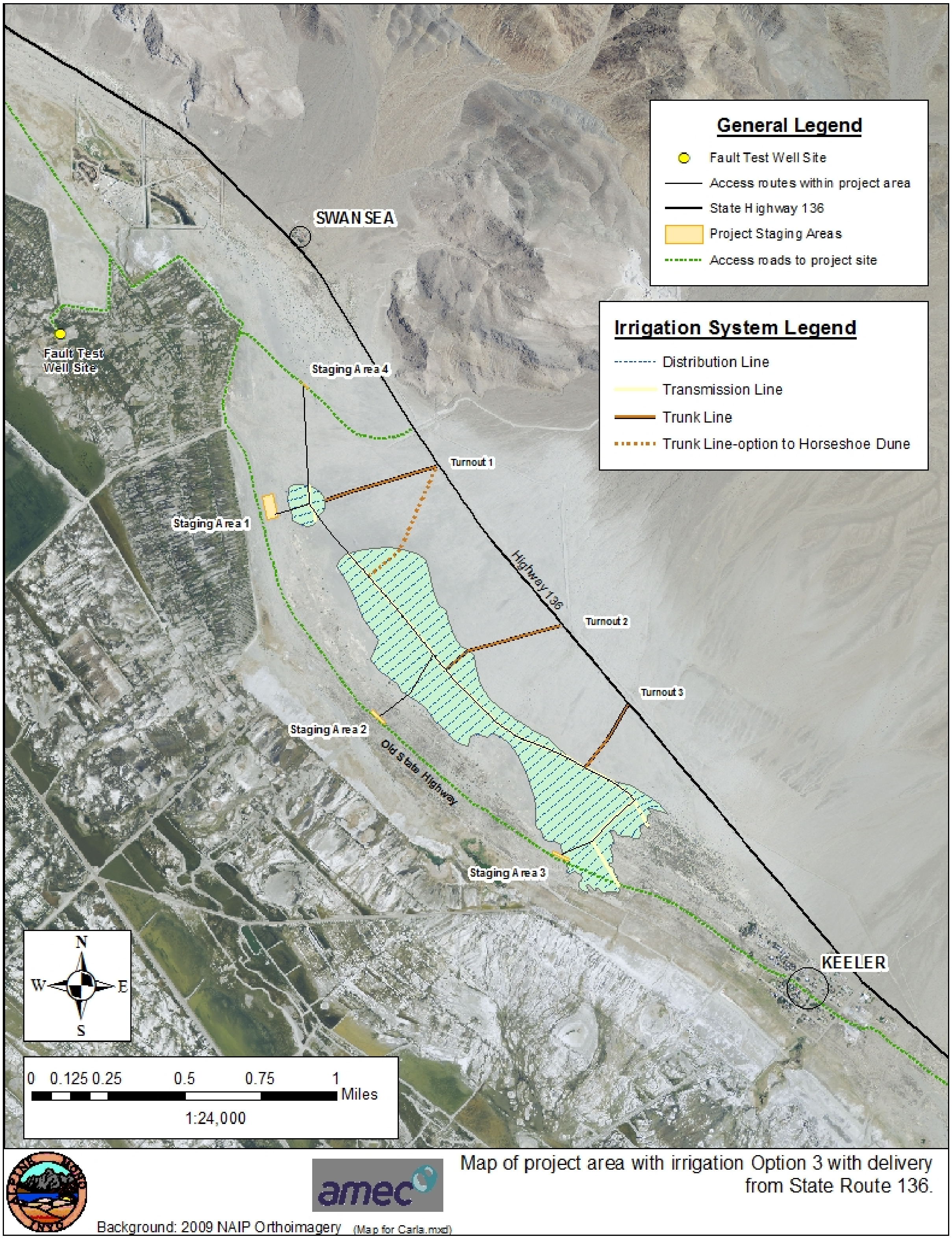

Figure 2. Map of irrigation Option 3 using a temporary irrigation system to water the entire project area.

A comparison of the elements required in the irrigation system options are provided in Table 2. The total pipe length needed for Options 2 and 3 are 13.23 and 14.03 miles, respectively. The pipe system would be a mix of 4 to 6-inch mainlines (trunk and transmission) and 2-inch distribution laterals. As much as possible, the 4 to 6-inch pipelines would be placed along the designated access routes in order to minimize the amount of disturbed area.

Table 2: Table of the amount of pipe and hose attachments needed for the different irrigation method options. Units for the pipe length are given in feet and miles (in parentheses). Hose attachment values are the total number needed.

Infrastructure element	**Option 1** Hand Watering Method	**Option 2** Temporary System with partial Hand Watering	**Option 3** Temporary System
Trunk lines	none	5,512 ft (1.04 mi)	5,512 ft (1.04 mi)
Trunk Lines (with optional line to northern project)	none	7,807 (1.48)	7,807 (1.48)
Transmission lines	none	10,706 (2.03)	9,663 (1.83)
Distribution lines	none	51,364 (9.73)	56,615 (10.72)
Hose attachment points	none	342	377
TOTAL PIPE (mi)	--	**13.23**	**14.03**

An estimate of the amount of travel needed for construction and irrigation events is provided in Table 3 for each irrigation option. The irrigation events are separated into that needed for watering at the time of planting (pre-planting and directly after planting) as well as supplemental watering events during plant establishment. In the project design, the bale locations would be irrigated with about 5 gallons prior to planting. Additionally, the plants would be watered with about 3 gallons per bale location (or about 1 gallon per plant) immediately following planting. If the weather conditions are unusually dry then the plants would be provided with supplemental water during the year. At most there would be two supplemental irrigation events per year – one in the spring and one in the late summer/early fall.

Table 4 summarizes the amount of travel potentially required during the first three years of the project. The highest amount of travel is during the first year of the project during construction, and planting of the plants. Each project year includes two supplemental irrigation events. These supplemental irrigation events would only occur if the amount of precipitation was well below normal or if dictated by poor plant health. The first supplemental irrigation event would occur in the spring as the plants begin to break dormancy for the growing season. The second supplemental irrigation event would occur in the late summer to early fall when the plants are conducting their late season plant growth episode. The work tables for the irrigation system calculations are provided at the end of the report.

Table 3: Table of mileage needed for construction, planting and supplemental watering with each irrigation option. The values for Option 1 and the hand watering portion of Option2 are provided using a 150 gallon hauling capacity for the ATV trailer mounted water tank. Mileage does not include water truck travel from the Fault Test Well.

Activity	**Option 1*** Hand Watering Method	**Option 2**** Temporary System with partial Hand Watering	**Option 3**** Temporary System
Construction miles	0	65	66
Pre-planting irrigation watering (5-gal/bale)	4,106	758	722
Watering at time of planting (3-gal/bale)	2,462	505	481
Total Supplemental Watering – 6 events	14,772	3,030	2,886
TOTAL MILEAGE	**21,340 mi**	**4,558 mi**	**4,155 mi**
* assumes each trip with ATV is = 1 mile ** values include a 25% contingency for construction miles, assumes each watering trip is ~1.5 mile			

Table 4: Table of estimated mileage needed for irrigation in the first, second and third year of the project. Estimate assumes 3 irrigation events in the first year and two during each of the following two years. Mileage does not include water truck travel from the Fault Test Well to the project.

Activity	**Option 1** Hand Watering Method	**Option 2** Temporary System with partial Hand Watering	**Option 3** Temporary System
First project year*	11,492	2,338	2,231
Second project year)**	4,924	1,010	962
Third project year**	4,924	1,010	962
* During the first year: Total irrigation = construction + pre-planting + at time of planting + supplemental 1 + supplemental 2 * During years 2 and 3: Total irrigation = supplemental 1 + supplemental 2			

As expected, irrigation Option 1 has the highest amount of travel required with over 11,000 miles traveled during the first year. Since each irrigation trip in Option 1 is estimated to be an average of 1 mile in length, there are also over 11,000 trips into and out of the dunes. During the second and third years of the project the amount of travel (and number of trips) drops to about 4,900 for Option 1. Options 2 and 3 include significantly less travel that Option 1 with about 2,300 and 2,200 miles in the first year of the project, respectively. This corresponds to about one-fifth the amount of the travel as compared to Option 1. During the second and third years of the project the mileage needed for the supplemental irrigation events in Options 2 and 3 is estimated at about 1,000 miles as compared to over 4,900 miles for Option 1.

Manpower Requirements and Irrigation Event Duration:

Irrigation of over 369,000 plants at over 123,000 straw bales is a big job regardless of the irrigation method used. The estimated number of people-days needed to conduct the irrigation events for the Keeler Project range from 770 to 385 days for the initial pre-plant watering to 513 to 257 days for successive watering events (both watering at the time of planting and supplemental watering events). These numbers represent the number of days that it would take one individual to conduct the irrigation work. It is anticipated that a crew of 10 people may be used for irrigation events such that the total number of days is reduced to 77-39 for the initial watering and 52-26 for each successive watering.

The length of time needed for watering the plants in the project with a temporary irrigation system is approximately half of that needed with a hand watering system. This time differential may play an important role in the success of plant establishment. In the hand watering irrigation option, it would take a crew of 10 people about 2 months to irrigate plants within the project. During this time the health of plants that need water will likely decline such that there may well be unnecessary plants deaths that compromise the success of the project. The length of time needed for a crew of 10 people to water the plants using the temporary irrigation system is about 4 weeks. The length of time needed for irrigation could be reduced by having larger irrigation crews in the dunes during each irrigation event.

Irrigation System Calculations
option 1 = hand watering
option 2 = mix of temp system and hand watering
option 3 = temporary system

Irrigation travel for initial watering (5 gallons per bale)			
Option 1	**Option 2**	**Option 3**	Notes
0	7807	7807	trunk - 4"
0	10706	9,663	transmission - 4"
0	51379	56615	distribution - 2"
0	69892	74085	total footage of irrigation system
0	13.23	14.03	total mileage of irrigation system
0	62	57	number of distribution lines
0	829	993	avg length of distribution line
0	342	377	number of hose attachments
0	6	7	avg number of attachments per line
0	360	326	number of bales per attachment
20	40	40	bales/hour
160	320 and 160	320	bales/day
770	404	385	people-days
77	40	38	days with 10 workers
15.4	8.1	7.7	weeks
5.3	1	1	number of trips per irrigation day
4106	404	385	total number of trips
1	1.5	1.5	avg distance per trip
5133	758	722	estimated mileage traveled (= # trips*avg distance*25% contingency)

Irrigation travel for supplemental watering (3 gallons per bale)			
Option 1	**Option 2**	**Option 3**	Notes
0	7807	7807	trunk - 4"
0	10706	9663	transmission - 4"
0	51379	56615	distribution - 2"
0	69892	74085	total footage of irrigation system
0	13.23	14.03	total mileage of irrigation system
0	62	57	number of distribution

			lines
0	829	993	avg length of distribution line
0	342	377	number of hose attachments
0	6	7	avg number of attachments per line
0	360	326	number of bales per attachment
30	60	60	bales/hour
240	480 and 240	480	bales/day
513	270	257	people-days
51	27	26	days with 10 workers
10.3	5.4	5.1	weeks
4.8	1	1	number of trips per irrigation day
2462	270	257	total number of trips
1	1.5	1.5	avg distance per trip
3078	505	481	estimated mileage traveled (= # trips*avg distance*25% contingency)

Construction travel			
Option 1	**Option 2**	**Option 3**	Notes
0	2569.0	2830.8	sticks of 2"
0	160	160	sticks per trip
0	16.1	17.7	trips
0	925.7	873.5	stick of 4"
0	50	50	sticks per trip
0	18.513	17.47	trips
0	35	35	Total trips
0	64.82	65.93	estmated total mileage (= #trips*avg distance*25% contingency)

APPENDIX K
USING ROUGHNESS (SOLID ELEMENTS AND PLANTS) TO CONTROL SAND MOVEMENT AND DUST EMISSIONS

Using Roughness (Solid Elements and Plants) to Control Sand Movement and Dust Emissions: Keeler Dunes Dust Demonstration Project, Interim Report

Prepared by: Jack Gillies, Desert Research Institute
Prepared for: Great Basin Unified Air Pollution Control District

September 26, 2013

Introduction

The delivery of dust-sized particles to the atmosphere is an aerodynamically-driven process. There is a complex interplay, however, between the resisting and driving forces that control the release and entrainment of these particles and the vertical flux of dust. The dust can be entrained from soils when the surface is susceptible and the shearing force of the wind is sufficient to entrain particles. Entrainment of dust into the wind also occurs when sand-sized particles transported by the wind (saltation) impact the surface and eject dust sized particles. Dust can also be released to the airflow as aggregates of sediment breakdown during the vigorous transport process. Developing effective controls for dust emissions at the local and regional scales is a scientific and engineering challenge and demanding of attention due to the effects of dust on human and animal health, visibility degradation, and other negative environmental impacts.

Recent research has indicated that roughness can be used effectively to modulate sand transport (and the associated dust emissions) and that prediction of sand flux reduction using the known geometric properties and the amount of roughness is possible using published relationships (e.g., Gillies et al., 2007; Gillies and Lancaster, 2013). Great Basin Unified Air Pollution Control District, based on sand flux and associated dust emission measurements, developed a sand flux reduction criterion for the Keeler Dunes that, if attained, is expected to achieve PM_{10} levels within the town of Keeler, CA, in compliance with State and Federal Air Quality regulations. The sand flux reduction target is 95%, which infers that sand flux within the area of control must be reduced to 5% of the flux that occurs in the absence of controls within open dune areas. The initial target of 95% reduction of sand flux was changed to 85% due to problems in receiving the contracted for amount of roughness elements, but this does not diminish the veracity of the testing procedures to demonstrate the effectiveness of the methodological approach to controlling sand transport and dust emissions.

Using the sand flux reduction criterion as a basis for designing effective dust control at the Keeler Dunes a dust control demonstration project was initiated within the Keeler Dunes in July 2013. This demonstration project will evaluate if the effectiveness of an array of roughness elements composed of solid elements and managed vegetation, which was designed based on published empirically-defined relationships between sand flux reduction and a dimensionless index of roughness (i.e., roughness density [λ]) achieves the required sand flux reduction. This project has two major goals: 1) to demonstrate that solid roughness elements placed on areas of the Keeler Dunes immediately arrest sand movement to specified levels, and 2) to assess whether native plant species, planted in the sheltered area of the solid roughness elements can effectively thrive and subsequently replace the solid roughness to achieve the desired sand flux reduction control efficiency.

This component of the report focuses on evaluating the effectiveness of the solid roughness elements to modulate the sand transport.

Methods

The solid element roughness used in the Keeler dust control demonstration project is straw bales. The straw bales are nominally 1.12 m long × 0.38 m high × 0.43 m wide. To create a roughness configuration using this size bale and achieve the target sand reduction, the relationship between normalized sand flux (NSF) and λ presented by Gillies and Lancaster (2013):

$$NSF = 0.0004\, \boldsymbol{\lambda}^{-1.871} \qquad (1)$$

was used to calculate the value of λ that would be required to meet the design criterion (i.e., NSF=0.15). NSF is defined as the ratio of sand flux at a measurement location within the roughness array divided by a measurement external to the roughness on the upwind side. The roughness density (λ) is defined as:

$$\lambda = n\, b\, h\, /\, S \qquad (2)$$

where n is the number of roughness elements occupying the ground area S (m^2), b is element breadth (m), and h is element height (m). A value of λ = 0.053 is needed, which required 502 bales be placed in the defined test area (50 × 100 m).

The positioning of the straw bales within the test area was established by copying a natural vegetation pattern nearby the Keeler Dunes composed of the species: x, y, and z. First, the spatial pattern was transferred to a representative model area of the same relative dimensions as the field scale area. Then the transferred pattern was adjusted in scale until 502 points fell within the scaled rectangle representing the field site. Each point within the scale model was ascribed a position (i.e., latitude and longitude) allowing these positions to be marked in the test plot area at the Keeler Dunes. Upon delivery of the straw bales to the site a bale was placed at each marker with the longest bale dimension oriented perpendicular to the expected mean prevailing wind directions. In this area winds with the highest frequency and magnitude that cause sand transport and dust emissions come from both the north and south. The centerline of the roughness array was oriented to 326°, to best capture the sand transport events driven by the bi-modal wind regime.

The test area was instrumented to measure: 1) sand flux external and internal to the array, and 2) wind speed and wind direction external and internal to the array. A diagram of the position of the instruments and the type of measurements at each position is shown in Fig. 1. Sand flux is measured using the GBUAPCD-designed Cox Sand Catcher (CSC) (Fig. 2), which is used on Owens Lake for the GBUAPCD Dust ID project. In addition Sensit piezoelectric saltation sensors (Fig. 2) are used to measure the on-set of saltation external and internal to the array, and the counts of sand particle impacts provides a second means to calculate NSF at each Sensit position within the roughness. Wind speed and direction are measured using NRG anemometers and wind vanes mounted on 4 m high masts (Fig. 3).

To further evaluate the movement of sand into and within the roughness array detailed topographic surveys of the sand surface and the straw bales are being collected through time using Terrestrial Lidar Scanning techniques (Fig. 4). This laser-based surveying method produces three-dimensional surface elevation data that can be used to map where sand deposits and agrades or erodes and deflates from

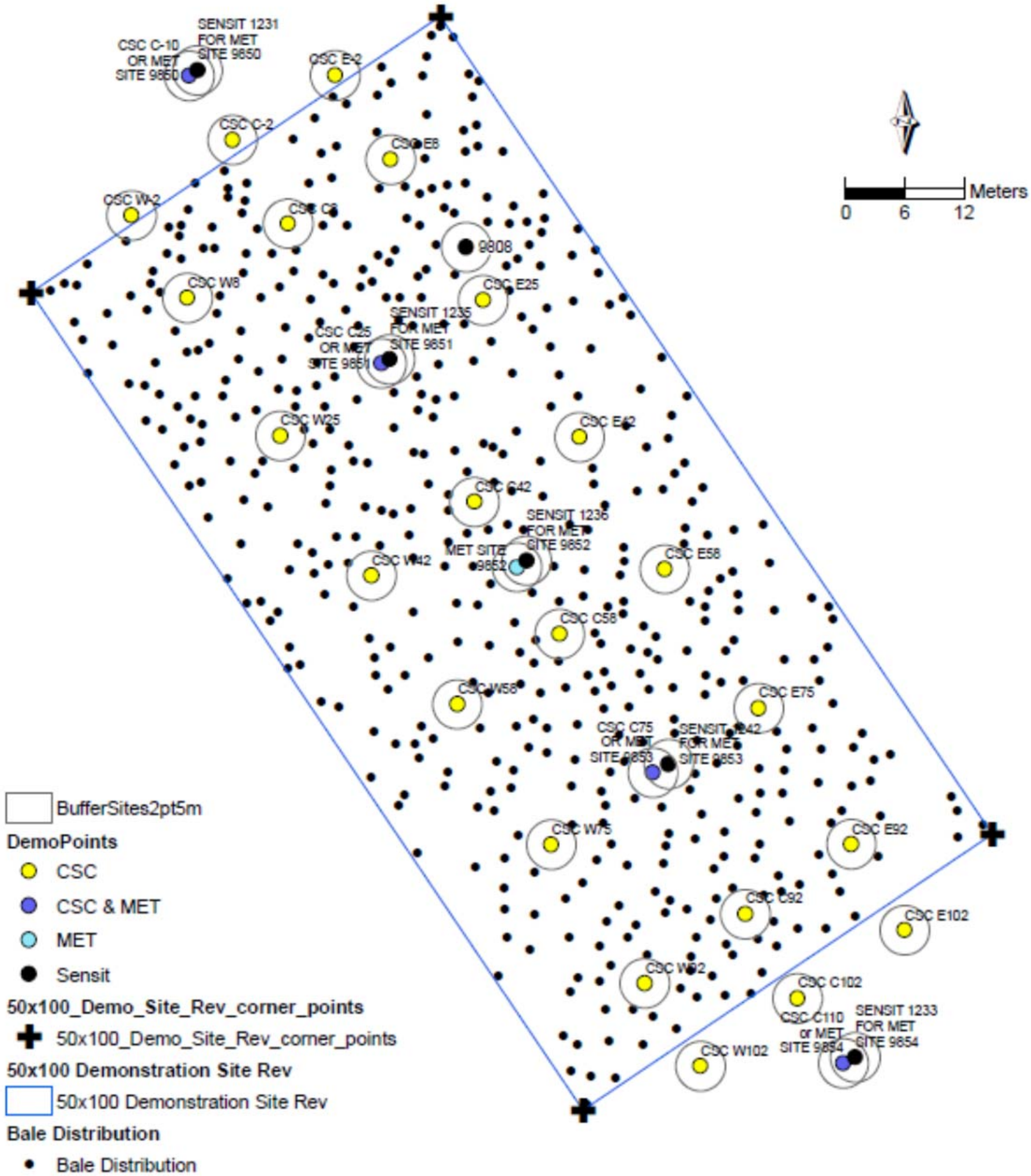

Figure 1. Schematic diagram showing placement of the roughness elements and instruments within the dust demonstration test are.

Figure 2. An image of a Cox Sand Catcher (left edge of image) and a Sensit piezolelectric saltation sensor (right edge of image) deployed within the roughness array.

Figure 3. The straw bale roughness elements and the 4 m high meteorological towers with anemometers and wind vanes.

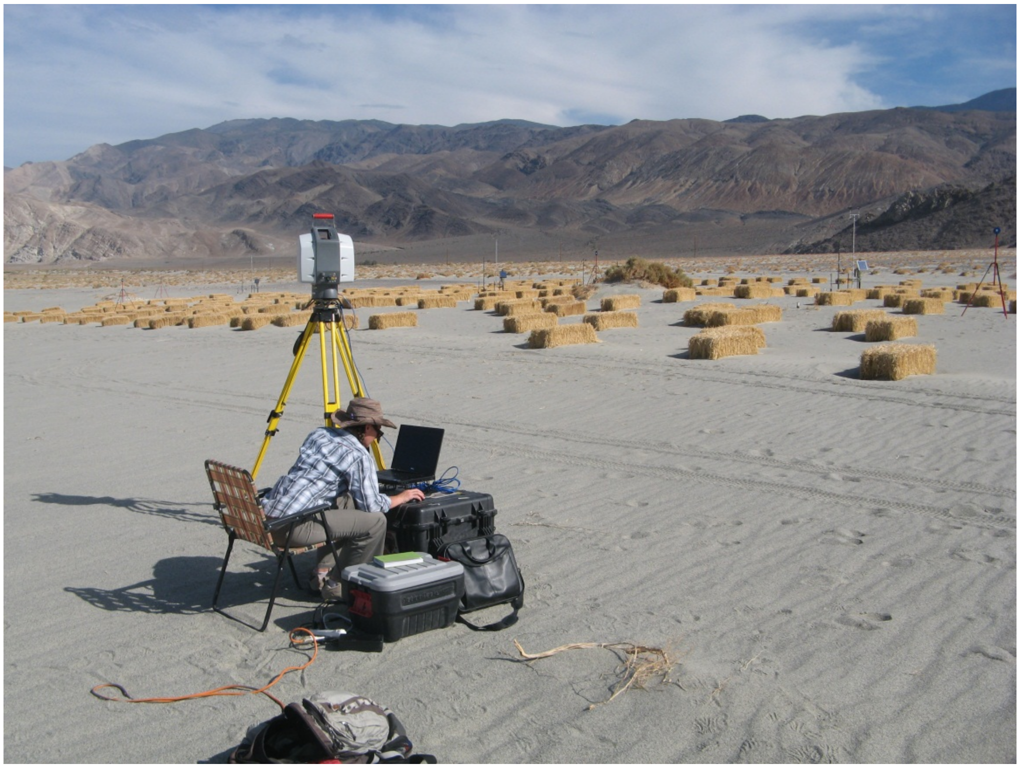

Figure 4. The Terrestrial Lidar Scanner deployed at the Keeler Dunes dust demonstration field site, September 11, 2013.

the test surface under the influence of the winds that exceed threshold. To date two scans of the test area have been acquired in July and September, 2013.

Results (through August 7, 2013)

Initial Sand Flux Measurements in the Presence of Existing Conditions Prior to Emplacement of the Roughness Elements and Vegetation

Prior to installation of the straw bales and vegetation CSCs were installed in a gridded array to measure the sand flux in the area where the roughness was to be emplaced. Measurements were initiated on 4/30/2013 and between that day and 5/22/2013, 18 events with the total mass in all traps ≥0.1 g were recorded with the CSCs. The mean NSF across each east-west grouping of CSCs as a function of distance from the leading northern edge of the roughness array is shown in Fig. 5. This figure shows that there was no discernible pattern in the transport of sand across the test site prior to emplacement of the roughness. The standard deviation of the mean NSF for each grouping of CSCs, represented by the error bars overlap for all cases, suggesting that within the uncertainty of the measurements sand flux was similar across and along the area in the presence of the roughness that existed prior to emplacement of the dust demonstration project roughness.

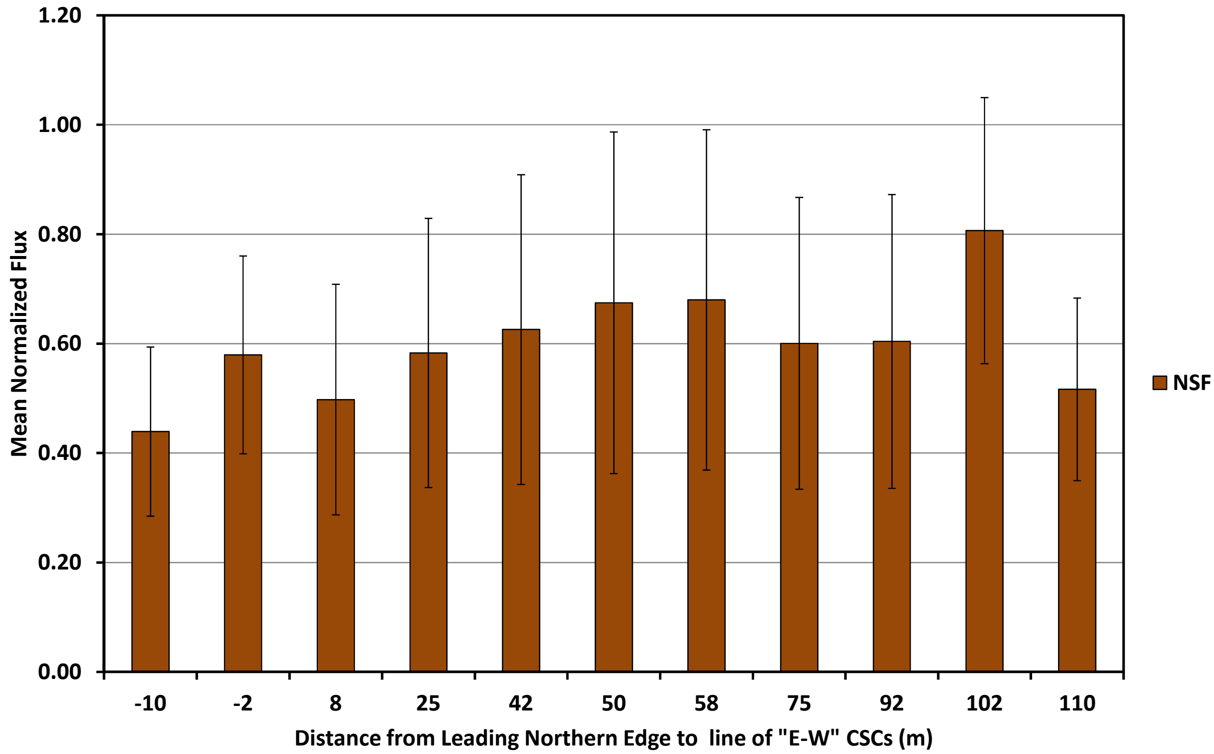

Figure 5. Mean NSF for the three CSC units across each east-west grouping CSCs as a function of distance from the leading northern edge of the roughness array.

Sand Flux Within and Exterior to the Roughness Array Following Emplacement of the Straw Bales

Following installation of the straw bales between 5/23/2013 and 8/7/2013, 74 transport events of varying duration and magnitude were recorded. The mean NSF as a function of normalized downwind distance (NDD=horizontal distance/element height) is shown if Fig. 6. As Fig. 6 shows the mean NSF decreases rapidly as a function of NDD from the north and south border of the roughness array to its interior. The mean NSF at the three positions at the deepest part of the roughness array (i.e., NDD=110.5, 131.6, and 152.6) is 0.06, suggesting that sand flux has dropped by 94% in the interior of the array compared to outside of the roughness array. The mean NSF value in the interior suggests that the roughness is performing better than expected. The roughness was expected to have an NSF=0.15.

These data can be separated based on the dominant transport directions, i.e., northerly and southerly wind events. The relationships between NSF and NDD for events representing transport events associated with northerly and southerly winds are shown in Figs. 7 and 8, respectively. For both transport directions the rate of change of decreasing NSF with increasing NDD is very similar, suggesting that there is no difference in the response of the sand flux to the roughness for either northerly or

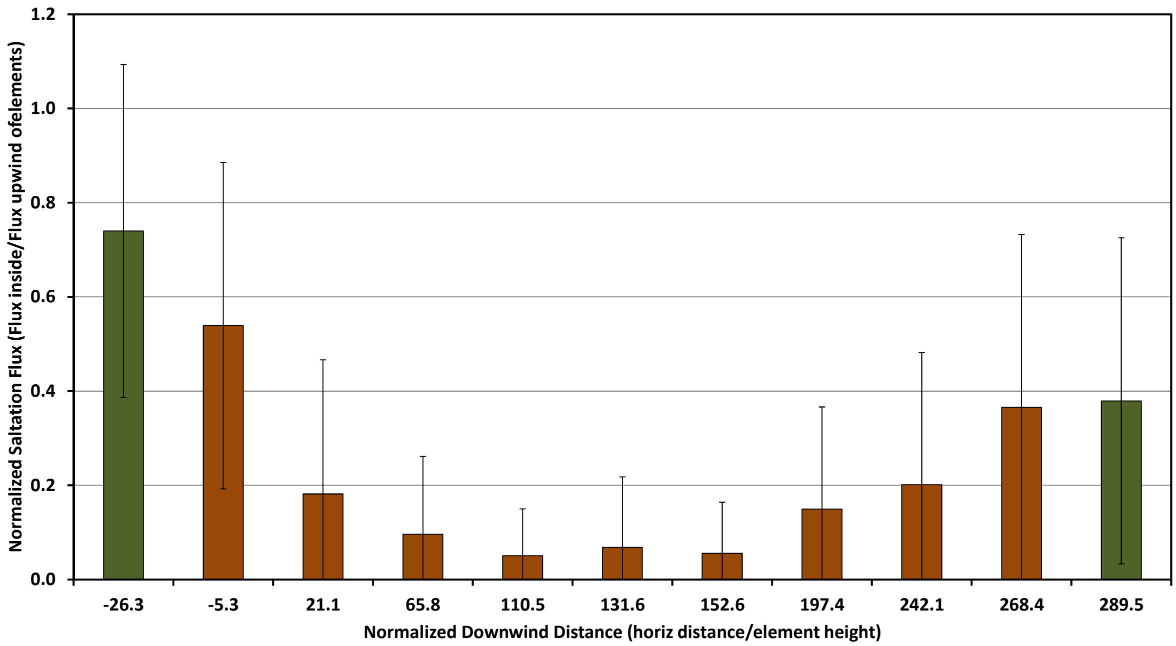

Figure 6. The mean NSF as a function of position within and exterior to the roughness array (refer to Fig. 1) showing that for all cases of sand transport the interior of the roughness shows a substantial reduction in the flux of sand. Green bars denote the two measurements exterior to the array on the northern and southern edges. Data represent transport of sand from multiple directions.

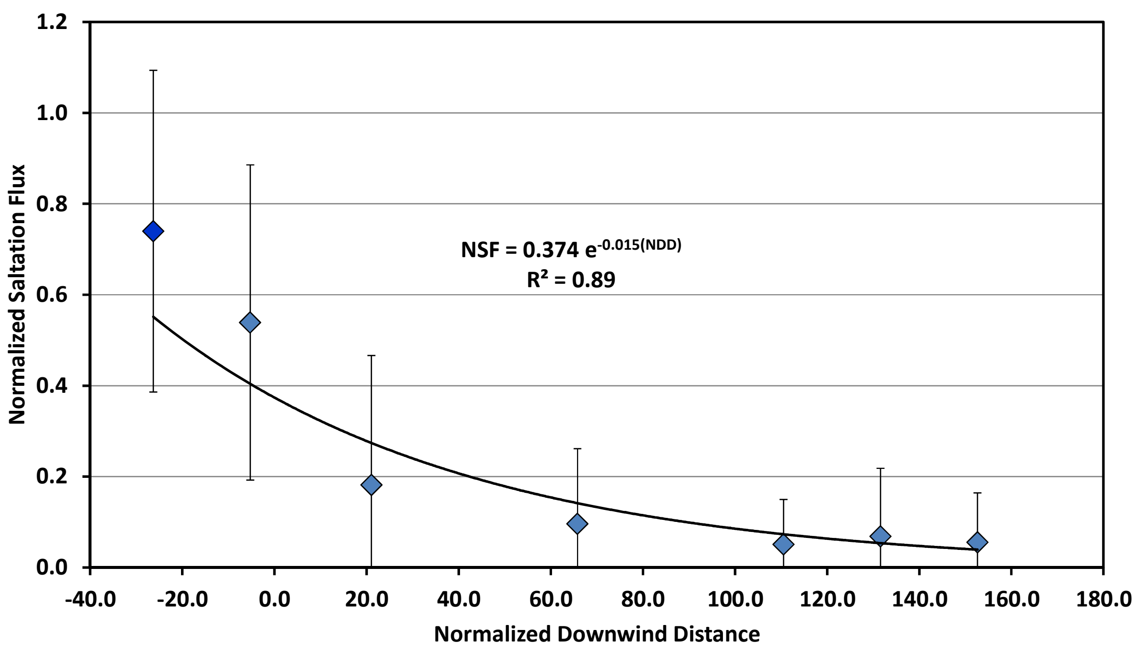

Figure 7. Mean NSF as a function of NDD for the north to south sand transport events. The dark blue data point on the left represents the measurement upwind and exterior to the roughness array.

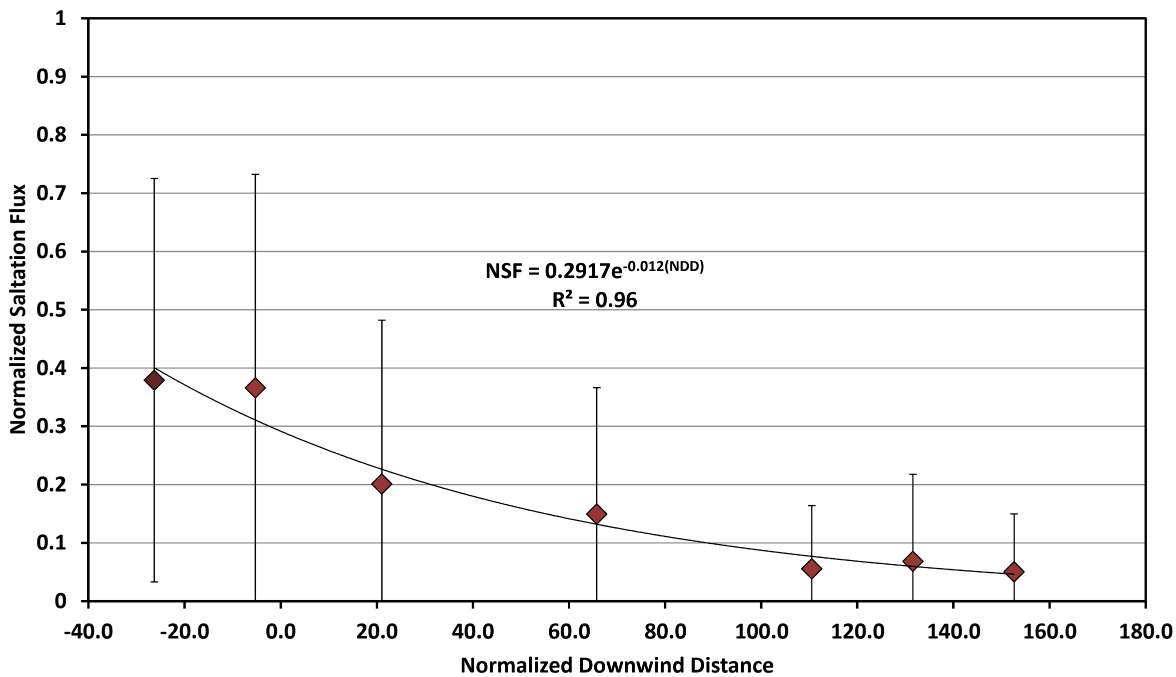

Figure 8. Mean NSF as a function of NDD for the south to north sand transport events. The dark red data point on the left represents the measurement upwind and exterior to the roughness array.

southerly transport events. The data can be combined into one general relationship showing how the NSF scales with increasing NDD into the roughness (Fig. 9).

The rate of change of NSF with increasing NDD for this project can be compared with other available studies (Fig. 10). This comparison of data shows that for the roughness array at the Keeler Dunes, the decrease in NSF with increasing NSF is less than has been observed at other locations. It must be noted that for Keeler Dunes the data collection to date is fairly limited and does not yet include any large scale and sustained transport events. The results to date indicate that the measured sand flux within the roughness is following expectations and corroborating the power of the empirical model used to design the array to meet the sand flux reduction target.

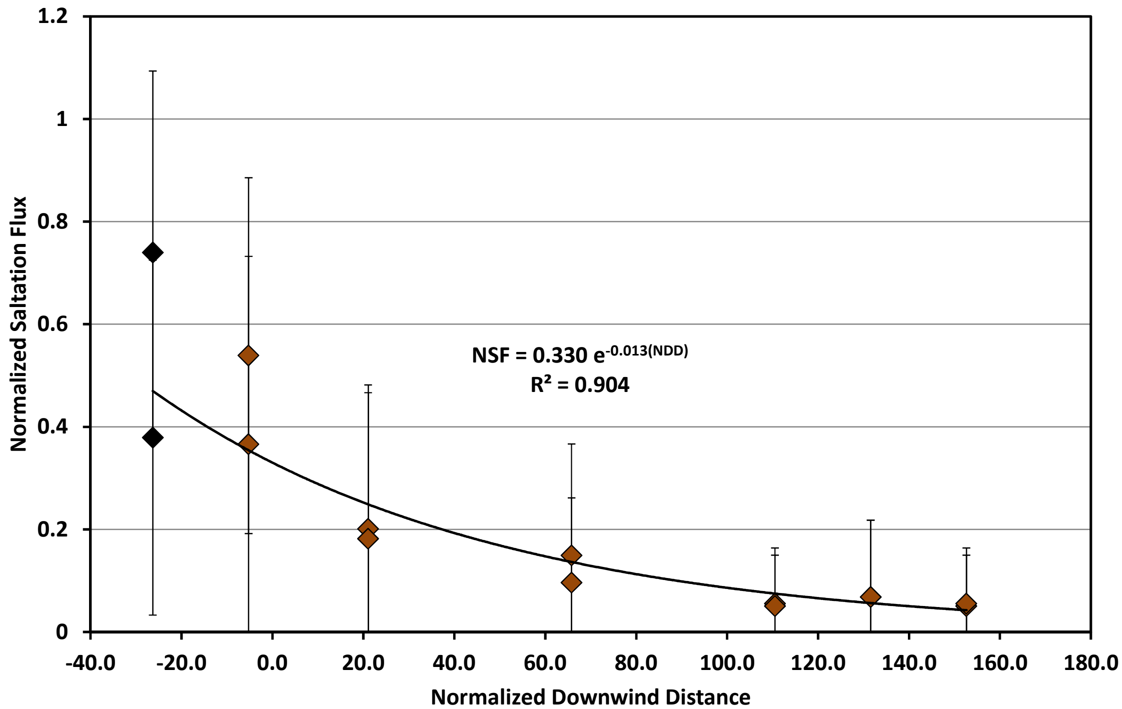

Figure 9. Mean NSF as a function of NDD for all sand transport events. The black points on the left represent the measurement upwind and exterior to the roughness array.

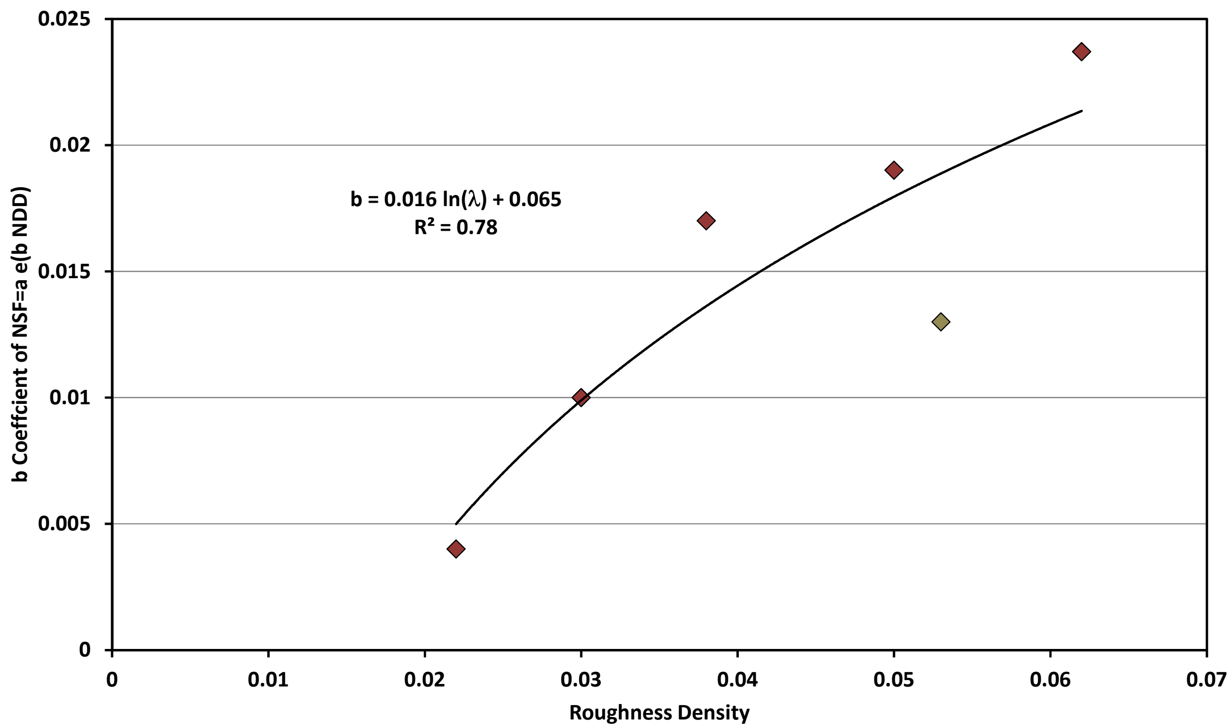

Figure 10. The relationship between the b coefficient in the NSF = a $e^{(b \times NDD)}$ and roughness density (λ) for data from Gillies et al. (2006) and Gillies and Lancaster (2013) and the roughness array at Keeler Dunes (green diamond). The regression-derived relationship combines all the data.

Wind Speed Threshold for Entrainment of Sand

The wind speed at which sand begins to be transported is an important environmental variable that characterizes the sensitivity of the sand surface to wind erosion and the accompanying dust emissions. Using the Sensit and wind speed data measured at 4 m above ground level (agl), an estimate of the threshold wind speed that causes entrainment of sand exterior and interior to the roughness elements at the study site. Threshold is defined here by the mean of all wind speed values that indicate saltation has been registered by the Sensit in the 5 minutes immediately following a 5 minute interval for which no Sensit counts were registered, and all wind speeds that show zero counts immediately following a 5 minute interval with counts. This takes into account the critical 5 minute long intervals where saltation begins and then ceases. The data are then sorted to represent the periods when the wind was northerly or southerly for each registered transport event. This procedure was carried out for days with measureable sand counts acquired by the Sensits. The mean threshold 4 m wind speed for each position along the centerline of the roughness for the southerly and northerly transport events is shown in Figs. 11 and 12, respectively. These figures show that the wind speed needed to reach threshold increases with distance from the leading edge of the roughness through to the last tower position before exiting the array. The relationship as expected is very similar for wind from both the south and the north. These figures illustrate several other important characteristics of the roughness array. First they show that once inside the roughness array it requires increasingly higher wind speeds to mobilize the sand, which means there is more protection afforded by this roughness configuration with distance from the leading edge. It also suggests that the size of the array does not allow the wind to come into equilibrium with the roughness over 75 m of fetch from the leading edge. The effect on threshold wind speed with increasing NDD is however, much less dramatic in affecting sediment transport rates than the roughness itself has on the change in flux rate (Figs. 7, 8, and 9).

Summary

The sand flux and wind data collected to date at Keeler Dunes Dust Demonstration Project clearly indicate that the straw bale roughness has modulated the sand flux compared to the flux in the absence of that roughness to a high degree. The mean reduction in the interior of the roughness array is approximately 94%, compared with flux in the absence of that roughness. To date the data suggest that the roughness is producing a higher control efficiency than the original design criteria specified.

The roughness also affects the threshold wind speed, showing that higher wind speeds as measured at 4 m above ground level are required to initiate saltation with increasing distance from the leading edge of the roughness. Based on measurements and visual observations it appears that the overall efficiency of this method to control sand movement and dust emissions increases with increasing area covered by the roughness elements. The edges of the roughness are most affected by higher winds and sand transport, but clearly the effectiveness to reduce sand motion occurs rapidly with increasing distance into the array. The perimeter to area ratio will decline as a power function meaning that the edge effect diminishes with respect to the effectiveness of control in the interior, so larger areas will have more area with maximum control efficiency for that roughness configuration than smaller areas. This also suggests that having higher roughness density around the edges can effectively increase overall control efficiency for smaller areas. These observations can be used to further increase the effectiveness of solid element roughness arrays to immediately arrest sand movement and dust emissions from the Keeler Dunes. This project will continue to collect data to refine the relationships and observations presented here.

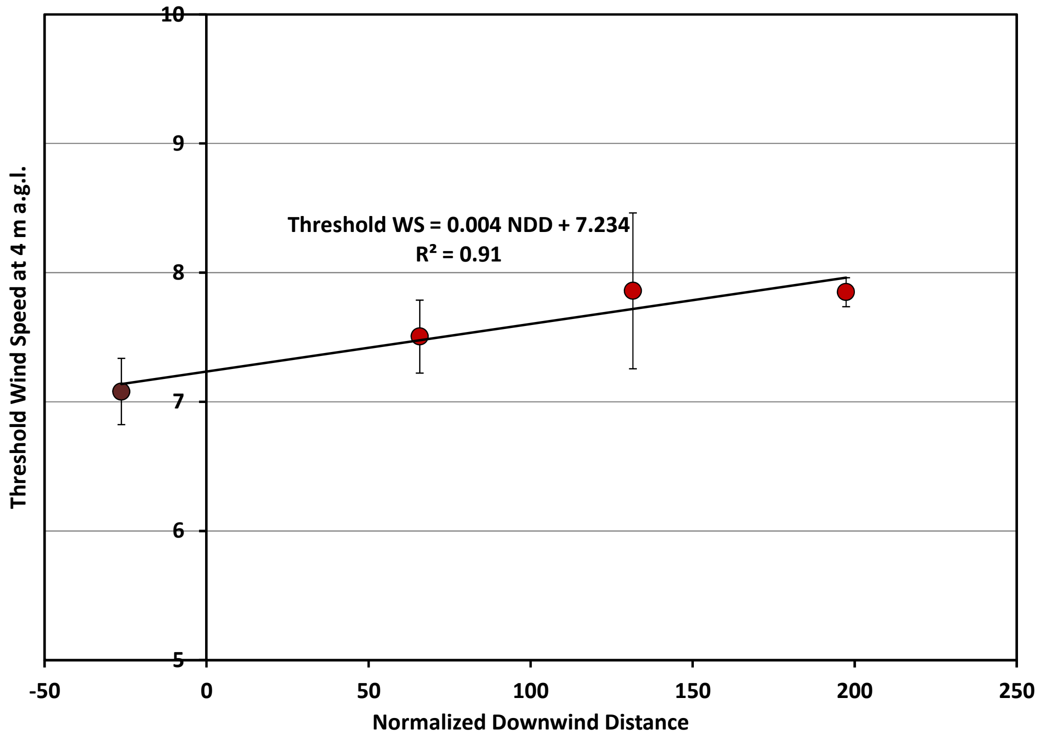

Figure 11. The relationship between mean threshold wind speed measured at 4 m a.g.l. and normalized downwind distance for southerly winds.

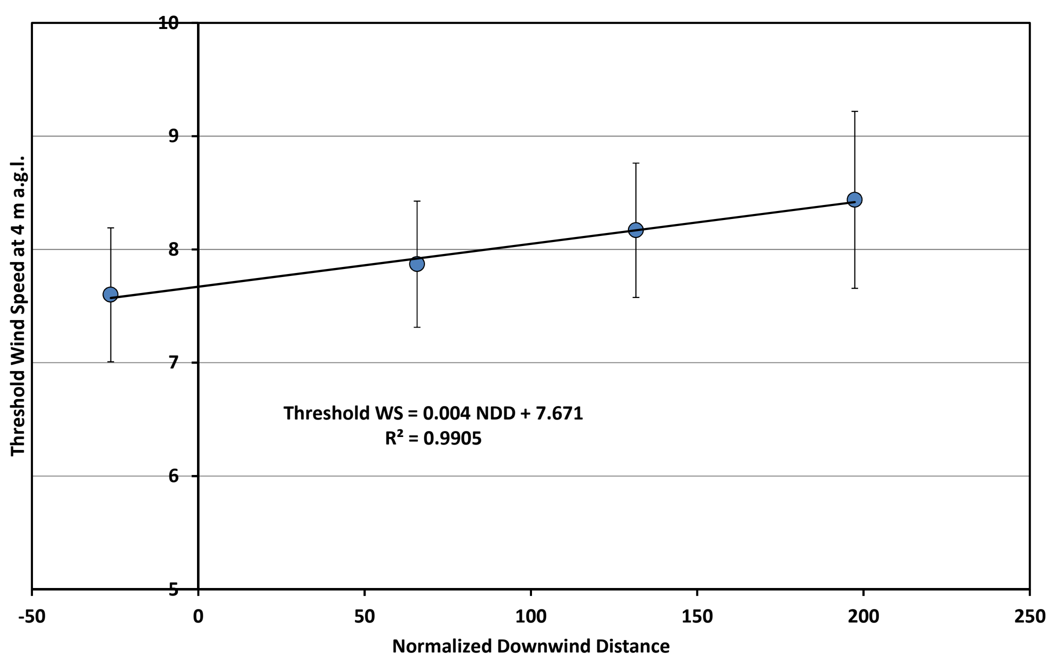

Figure 12. The relationship between mean threshold wind speed measured at 4 m a.g.l. and normalized downwind distance for northerly winds.

APPENDIX L
PRELIMINARY RESULTS OF PLANT ESTABLISHMENT

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Technical Memorandum

From: Grace A. McCarley Holder, Geologist

To: Sapphos Environmental INC.

Date: October 4, 2013

Subject: Preliminary Results of Plant Establishment in the Straw Bale Demonstration Dust Control Project

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Introduction

The District is currently testing a potential new dust control measure that uses straw bales and native plants. The straw bales act as roughness elements to stabilize an active source area and also as shelter for newly planted native shrubs. In the conceptual design of the measure, dust control will be transferred from the bales, as they degrade over time, to the plants as they mature and grow. The beauty of the conceptual design of the project is that immediate control of an active dust source area is achieved with the placement of the straw bales and that full dust control effectiveness is maintained throughout establishment and growth of the native shrubs. Additionally, the potential new control measure can be implemented with minimal impacts to existing natural resources and if placed in the right environment can ultimately be self-sustaining.

In order to determine if the conceptual design of the proposed new dust control measure will work within the design parameters, the District is conducting a small-scale test of the straw bale measure. The 50 meter by 100 meter (1.2 acre) test site for the project (Straw Bale Demonstration Project) is located in the northern portion of the Keeler Dunes on an active sand sheet. If successful, the new dust control measure could be used on a large scale within the dunes as well as on other active dust sources in the area, such as those on the bed of Owens Lake. In particular, this new control measure has applicability in the transition from Shallow Flooding to Managed Vegetation or to a Managed Vegetation-Shallow Flooding control combination (termed “Hybrid”).

The Straw Bale Demonstration Project has two main components being tested and monitored:

1) control effectiveness (reduction in the sand motion and surface winds across the site) and
2) establishment of selected native shrubs.

The purpose of this technical memorandum is to present the results, as of September 13, 2013, on the establishment of the native shrubs planted on the test site on May 30, 2013. An interim report on the control effectiveness or the effect of the straw bale array on the wind speed and sand motion across the test site is being prepared by Dr. Jack Gillies of the Desert Research Institute (DRI) in a separate technical report (Gillies, 2013).

Overview of Straw Bale Demonstration Test

The Straw Bale Demonstration Project site was instrumented with sand catchers, Sensits and meteorological equipment in April 2013. Placement of the 504 straw bales on the site occurred on two dates, May 23 (336 bales) and June 12 (168 bales). Several weeks of pre-bale monitoring was conducted on the test site prior to bale placement in order to measure the pre-control magnitude and the spatial variability of the sand motion and wind data across the site.

A critical component of the Straw Bale test is the establishment of native shrubs on the site. As such, the District contracted with Ms. Katie Quinlan of the Bristlecone Chapter of the California Native Plant Society in the spring of 2012 for propagation of shrubs in anticipation of the test beginning in the fall of 2012[1]. Five species of locally adapted native shrubs were planted and propagated at the White Mountain Research Station (WMRS) facility in Bishop, CA operated cooperatively by the Bristlecone Chapter of the California Native Plant Society, Bureau of Land Management (BLM), and the U.S. Forest Service. The five species (listed below) chosen for planting on the test site are found naturally within the Owens Lake area and were considered to have a high likelihood of success.

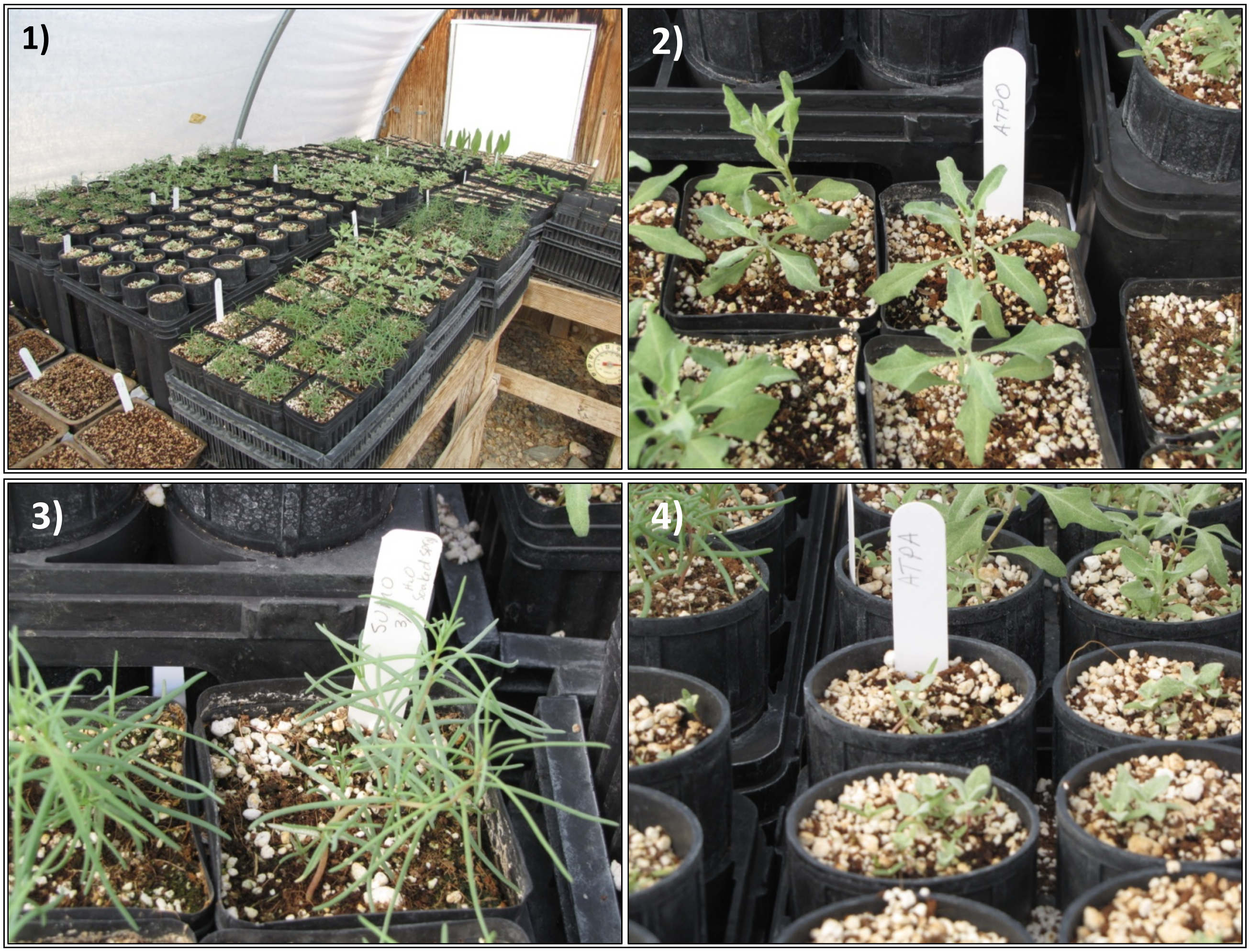
Atriplex polycarpa (ATPO) – cattle saltbush, cattle spinach
Atriplex parryi (ATPA) – Parry's saltbush
Atriplex confertifolia (ATCO) - shadscale
Sarcobatus vermiculatus (SAVE) - greasewood
Suaeda moquinii (SUMO)[2] – Mojave seablite, bush seepweed

Three hundred and twenty eight plants (328) were started in April 2012 from a combination of seed and stem cuttings. Seed used for the project was collected by District staff in the fall of 2011 from plants in the Owens Lake area. Literature research indicated that *S. vermiculatus* and *A. confertifolia* are difficult to propagate from seed such that stem cuttings of these two species were collected and placed in a cutting box for root development and cultivation. The other three species (*A. parryi, A. polycarpa, and S.moquinii)* were propagated from seed. Approximately one-third of the shrubs started in April 2012

[1] Note: The test was originally planned to begin in September of 2012. However, due to a delay in getting the funding for the test, the test did not begin until April of 2013, approximately 7 months behind schedule. The plants started in April 2012 were ready to plant in the fall of 2012 but had to be kept in pots over the winter. A combination of unusually cold weather in December and January, heavy herbivory, and lack of success of the cuttings reduced the number of plants from 328 to 143 over the winter. Two plants were in poor condition in May 2013 and were not planted leaving 141 total plants placed in the ground on May 30, 2013.

[2] Note: According to the current Jepson Manual of plant identification, the classification for this species has changed. The current species name is *Suaeda nigra* instead of *Suaeda moquinii.* For the purposes of this report and project the former name of *Suaeda moquinii* will continue to be used to avoid confusion.

were from cuttings and two-thirds from seed. Photos 1-6 provide pictures of the seedlings and stem cuttings of the native plants propagated for the Straw Bale Demonstration Test in April 2012.



Photos 1-4: Native plant seedlings in April 2012. Photo 1 (upper left) – overview of seedlings in the greenhouse at WMRS. Photo 2 (upper right) – ATPO seedlings. Photo 3 (lower left) – SUMO seedlings. Photo 4 (lower right) – ATPA seedlings.

Photo 5: Placement of SAVE cuttings into prepared perlite bed in the cutting box.

Photo 6: View of SAVE and ATCO cuttings in the cutting box on April 15, 2012.

Table 1 provides the number of planted individuals of each species and the method of propagation used. Notice that of the 328 plants originally propagated in April 2012 only 141 (or 43%) were actually placed in the ground in May 2013. This was due to a combination of a high rate of herbivory over the winter, extremely cold weather in December 2011 and January 2012 and poor success of the rooting and establishment of the stem cuttings (see footnote [1]).

Table 1. Native shrubs planted on the Straw Bale Demonstration Project site in May 2013.

Species – Scientific Name	Abbreviation	Common Name	Number of Plants started in April 2012	Propagation Method	Number of Shrubs Planted in May 2013
Atriplex confertifolia	ATCO	Shadscale saltbush	49	Cuttings	23
Atriplex parryi	ATPA	Parry's saltbush	59	Seed	46
Atriplex polycarpa	ATPO	Cattle spinach, Cattle saltbush	90	Seed	54
Sarcobatus vermiculatus	SAVE	Greasewood	64	Cuttings	12
Suaeda moquinii[2]	SUMO	Mojave seablite, bush seepweed	66	Seed	6
		TOTAL	**328**		**141**

Planting and Watering

Planting of the native shrubs on the test site was conducted on May 30, 2013 in association with the first shipment of bales. The shrubs were planted in a block of 47 bales located on the southeastern portion of the test site. Three shrubs were planted along the northern side of each bale. In between the plants, two watering tubes were installed to facilitate the delivery of water directly to the root zone area (Photos 7 and 8). Figure 1 provides a map of the test site and the block of bales where the native shrubs were planted.

Photo 7: Plants and watering tubes ready for placement in the ground, May 30, 2013.

Photo 8: Picture of the newly planted shrubs along the edge of a straw bale, May 30, 2013.

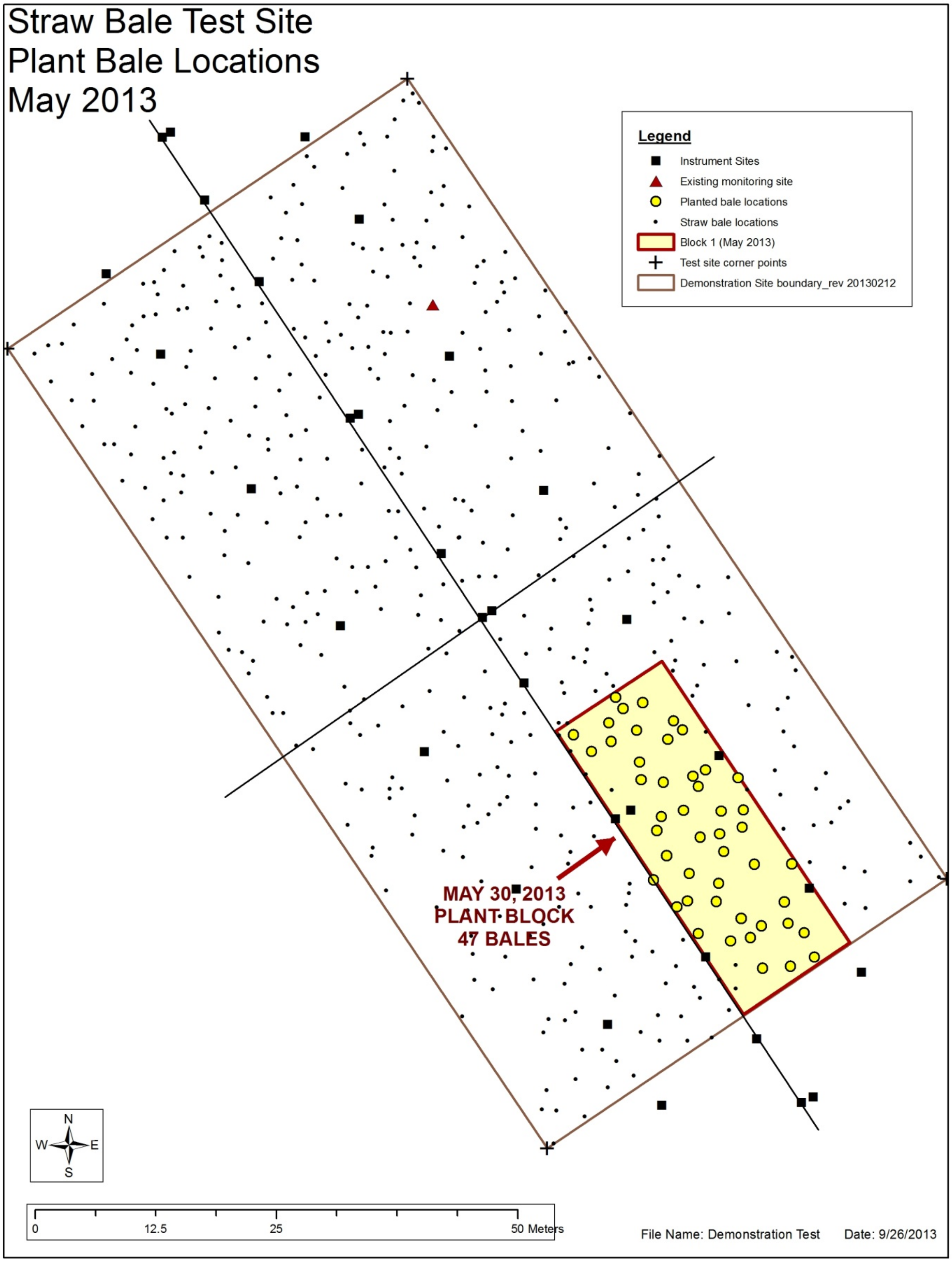


Figure 1. Map showing the location of the block of bales (highlighted in yellow) for the May 2013 planting of native shrubs on the Straw Bale Test Project.

Minimal preparation of the soil was conducted prior to planting of the shrubs. Due to the dry conditions of the sand sheet in the test area, the ground underneath and along the northern side of the selected bales was watered with approximately 5.4 gallons of water the day before (May 29, 2013) placement of the plants in the ground. Three teams of two people worked for approximately 2-3 hours in planting the shrubs and installing the watering tubes. The plants and watering tubes were placed in a trench approximately 18-20"long and 6-8" wide dug using a small hand shovel. The trench was backfilled with the borrowed sand and tamped around the plants and watering tubes. Care was taken by each team to remove each plant from the pot and in placing each plant in the ground in order to maintain the integrity of the soil around the roots. However this was particularly difficult for the ATPA which tended to fall apart when removed from their pots.

Following planting, each planted bale location was watered with approximately 5.4 gallons of water applied mostly through the watering tubes directly to the root zone of the plants. Due to the harsh conditions during June and July 2013, the newly planted shrubs were given supplemental water to assist in establishment. During the first month following planting, supplemental water was provided seven times with an average of 4 days between watering events. The watering frequency was reduced to an average of every 7-8 days during July through mid-September. Then in mid-September, the irrigation schedule was further reduced to approximately every two weeks. The District is planning on continuing to reduce the frequency of irrigation first to once every three weeks and then four weeks until the end of the growing season. During all of the supplemental watering events following planting on May 30, 2013, an average of 3.0 gallons of water was provided to each planted bale. A summary of the water use and irrigation schedule is provided in Table 2.

A portable watering system is used to provide water to the plants on the test site. The system consists of a 250 gallon plastic tank and small pump mounted on an ATV trailer. The water is transported from the tank to the planted bales through a 1-inch fire hose (Photo 9). The water tank is filled with water at the District's Keeler field office/yard. Fertilizer was applied once to the plants on the test site. The application was conducted on July 3, 2013 and consisted of approximately 1 teaspoon of slow release fertilizer pellets (Osmocote Smart-release Plant Food 14-14-14) added to each watering tube.

Photo 9. Water tank and fire hose system used to provide water to the plants on the test site.

Plant Survivorship

Following planting of the shrubs on the test site, the health of the plants was monitored regularly. During each monitoring event the vigor or overall health of each plant is assessed based on a qualitative ranking scale that ranges from 0-4: Excellent (4), Good (3), Fair (2), Poor (1), and Dead (0). The vigor rankings are based on factors such as number of leaves, leaf color, leaf size, presence of new growth, etc. Photographs were taken of the plants at each bale just after planting (5/30/2013), mid-summer (7/17/2013) and at the end of September (9/30/2013).[3] Tables 3 through 5 provide a summary of the plant vigor and mortality/survivorship data from May 30, 2013 to September 13, 2013.

As of September 13, 2013, the overall survivorship rate was at 72% for the 141 shrubs planted on May 30, 2013. Thirty-nine individual plants have died over the first 15 weeks of the test. The total number of plant deaths is primarily dominated by one species. Over two-thirds of the total number of plant deaths (27 out of 39 total dead) has occurred in the ATPA population. This accounts for over 50% of the 46 original ATPA planted on the test site.

Perhaps just as important as or perhaps even more important than focusing on the number of plants that have died is to look at the vigor of the surviving 102 plants on the test site. As of September 13, 2013, 66% of the living plants are doing well with a vigor rating of Good or Excellent while only 34% are in the Fair and Poor categories (Table 3).

[3] Note: Subsequent plant monitoring will include photos of the plants in the spring when they break dormancy (March or April), at peak plant biomass (July), and at the end of the season (November). Additional photos were taken during the initial plant establishment in order to document the plant establishment and growth.

Table 2. Summary of the water schedule and use on the Demonstration Test site as of September 13, 2013.

Date	Total gallons	Gallons per Bale	Water per plant	Notes
5/29/2013	255	5.4	N/A	pre-planting watering
5/30/2013	255	5.4	1.8	initial plant watering
6/03/2013	120	2.6	0.9	
6/06/2013	120	2.6	0.9	
6/10/2013	100	2.1	0.7	
6/14/2013	220	4.7	1.6	
6/20/2013	120	2.6	0.9	
6/25/2013	120	2.6	0.9	
6/28/2013	120	2.6	0.9	
7/03/2013	125	2.7	0.9	start watering once per week
7/15/2013	125	2.7	0.9	
7/22/2013	120	2.6	0.9	
8/01/2013	130	2.8	0.9	
8/06/2013	140	3.0	1.0	
8/15/2013	140	3.0	1.0	
8/22/2013	140	3.0	1.0	
8/30/2013	140	3.0	1.0	
9/06/2013	140	3.0	1.0	
9/13/2013	140	3.0	1.0	start watering every 2-4 wks
9/30/13				planned irrigation event
10/21/13				planned irrigation event
11/18/13				planned irrigation event
Total	**2,770**	**58.9**	**17.8**	
Average	**145.8**	**3.1**	**1.0**	

Table 3. Summary of plant vigor data from 5/30/2013 to 9/13/2013. Vigor results are given as the total number of plants within each vigor classification ranking. (ND = no data)

Date	Plant Vigor				
	Dead	Poor	Fair	Good	Excellent
5/30/2013	0	0	13	127	1
6/03/2013	2	2	ND	ND	ND
6/05/2013	4	3	19	112	3
6/10/2013	4	5	20	109	3
6/14/2013	3	3	27	88	19
6/20/2013	3	3	29	88	18
6/25/2013	4	3	28	88	18
6/28/2013	8	4	24	87	18
7/03/2013	9	3	16	92	21
7/15/2013	13	11	31	79	7
7/22/2013	18	6	31	79	7
8/01/2013	23	7	20	64	19
8/06/2013	23	21	23	55	19
8/15/2013	28	17	25	49	22
8/22/2013	32	18	20	47	24
8/30/2013	35	17	20	46	23
9/06/2013	38	19	15	45	24
9/13/2013	39	19	16	41	26

Table 4. Summary of plant mortality from 5/30/13 to 9/13/13.

Date	Number of Dead Plants by Species					Total # Dead	Overall % dead	Total # living	Overall % alive
	ATCO	ATPA	ATPO	SAVE	SUMO				
5/30/2013	0	0	0	0	0	0	0	141	100
6/03/2013	0	1	1	0	0	2	1	139	99
6/06/2013	0	3	1	0	0	4	3	137	97
6/10/2013	0	3	1	0	0	4	3	137	97
6/14/2013	0	2	1	0	0	3	2	138	98
6/20/2013	0	2	1	0	0	3	2	138	98
6/25/2013	0	3	1	0	0	4	3	137	97
6/28/2013	1	6	1	0	0	8	6	133	94
7/03/2013	1	7	1	0	0	9	6	132	94
7/15/2013	1	11	1	0	0	13	9	128	91
7/22/2013	1	14	2	0	1	18	13	123	87
8/01/2013	1	17	3	0	2	23	16	118	84
8/06/2013	1	17	3	0	2	23	16	118	84
8/15/2013	1	21	3	0	3	28	20	113	80
8/22/2013	1	24	3	0	4	32	23	109	77
8/30/2013	2	26	3	0	4	35	25	106	75
9/06/2013	2	27	3	1	5	38	27	103	73
9/13/2013	2	27	3	2	5	39	28	102	72

Table 5. Summary of the plant survivorship given as percentage of original number of shrubs planted for each species from 5/30/13 to 9/13/13.

Date	% Survivorship by species				
	ATCO	ATPA	ATPO	SAVE	SUMO
5/30/2013	100.0	100.0	100.0	100.0	100.0
6/03/2013	100.0	97.8	98.1	100.0	100.0
6/06/2013	100.0	93.5	98.1	100.0	100.0
6/10/2013	100.0	93.5	98.1	100.0	100.0
6/14/2013	100.0	95.7	98.1	100.0	100.0
6/20/2013	100.0	95.7	98.1	100.0	100.0
6/25/2013	100.0	93.5	98.1	100.0	100.0
6/28/2013	95.7	87.0	98.1	100.0	100.0
7/03/2013	95.7	84.8	98.1	100.0	100.0
7/15/2013	95.7	76.1	98.1	100.0	100.0
7/22/2013	95.7	69.6	96.3	100.0	83.3
8/01/2013	95.7	63.0	94.4	100.0	66.7
8/06/2013	95.7	63.0	94.4	100.0	66.7
8/15/2013	95.7	54.3	94.4	100.0	50.0
8/22/2013	95.7	47.8	94.4	100.0	33.3
8/30/2013	91.3	43.5	94.4	100.0	33.3
9/06/2013	91.3	41.3	94.4	91.7	16.7
9/13/2013	91.3	41.3	94.4	83.3	16.7

The cause for the high death rate for the ATPA is uncertain but is thought to be related to the long flexible (“leggy”) plant stems and poor root development. Instead of having a stiff upright stem structure, the ATPA plants placed on the test site in May 30, 2013 were short in height and had long leggy stems (Photos 10 and 11). Observations made during plant monitoring events note that the APTA stems were buried and burned by the hot sand moving within the project. District staff uncovered the affected plants on several occasions from the sand that covered them but generally the damage was already done. Another contributing factor to the high mortality of the ATPA is thought to be the root development structure. While being planted on the test site, the soil of many of the ATPA “fell apart” when the plant was removed from the pot for placement into the prepared trench. This did not occur with the other plant species and is thought to have occurred due to the root distribution of the ATPA. Instead of having roots distributed throughout the soil column in the pot, roots were concentrated at the top near the surface and at the base of the pot with very few roots in-between creating poor soil-root integrity.

In addition to the high mortality rate for the ATPA, the SUMO population has also experienced high mortality with the death of 5 of the 6 original plants. However, unlike the ATPA which started to die within the first few days of being planted, all of the SUMO deaths have occurred since July 22, 2013 (Table 4). The main cause of the SUMO deaths is thought to be from browsing from small mammals that have started to utilize the test site. Similarly, browsing impact has been observed on the SAVE plants (although not as severe as the SUMO). Wire protective cages were constructed and placed around all plants at bales containing either SUMO or SAVE in mid- September 2013.

The most successful species, through 9/13/13, are the ATPO and ATCO. Both species have survivorship rates over 90% (see Table 5). The SAVE population also has a high survivorship rate of over 80%. Both SAVE deaths have occurred in September 2013 and, as mentioned above, are thought to be related to browsing activities from small rodents.

Figures 2 through 4 show plots of the plant monitoring data through September 13, 2013. The overall survivorship of the plants on the test site is 72% as of September 13, 2013. The weighted average vigor ranking for all of the plants on the test site has declined from 2.9 on May 30, 2013 to 1.97 on September 13, 2013 (Figure 4).

To illustrate the change over the first four months of the project, photo sequences of the plants at three different bales are presented in Photos 12-14. The photos were taken on three dates; at the time of planting (5/30/2013), mid-summer (7/17/2013), and at the end of September (9/30/13). The photos taken at bale numbers 5, 8 and 47 (see Photos 12- 14) illustrate the overall growth and Good to Excellent vigor rating of the ATPO and ATCO plants over the course of the summer. An example of one of the wire protective structures installed to protect the SAVE and SUMO plants is visible in Photo 12C.

Photos 10 and 11. Photos showing the long leggy stems of the ATPA on May 30, 2013. Photo 10 (left) shows the contrast in plant structure between the ATPA (in the tray near the cardboard box) and the rest of the plants. Photo 11 (right) shows a close up of an ATPA in its pot prior to planting. Notice the long leggy stems draped over the edge of the pot.

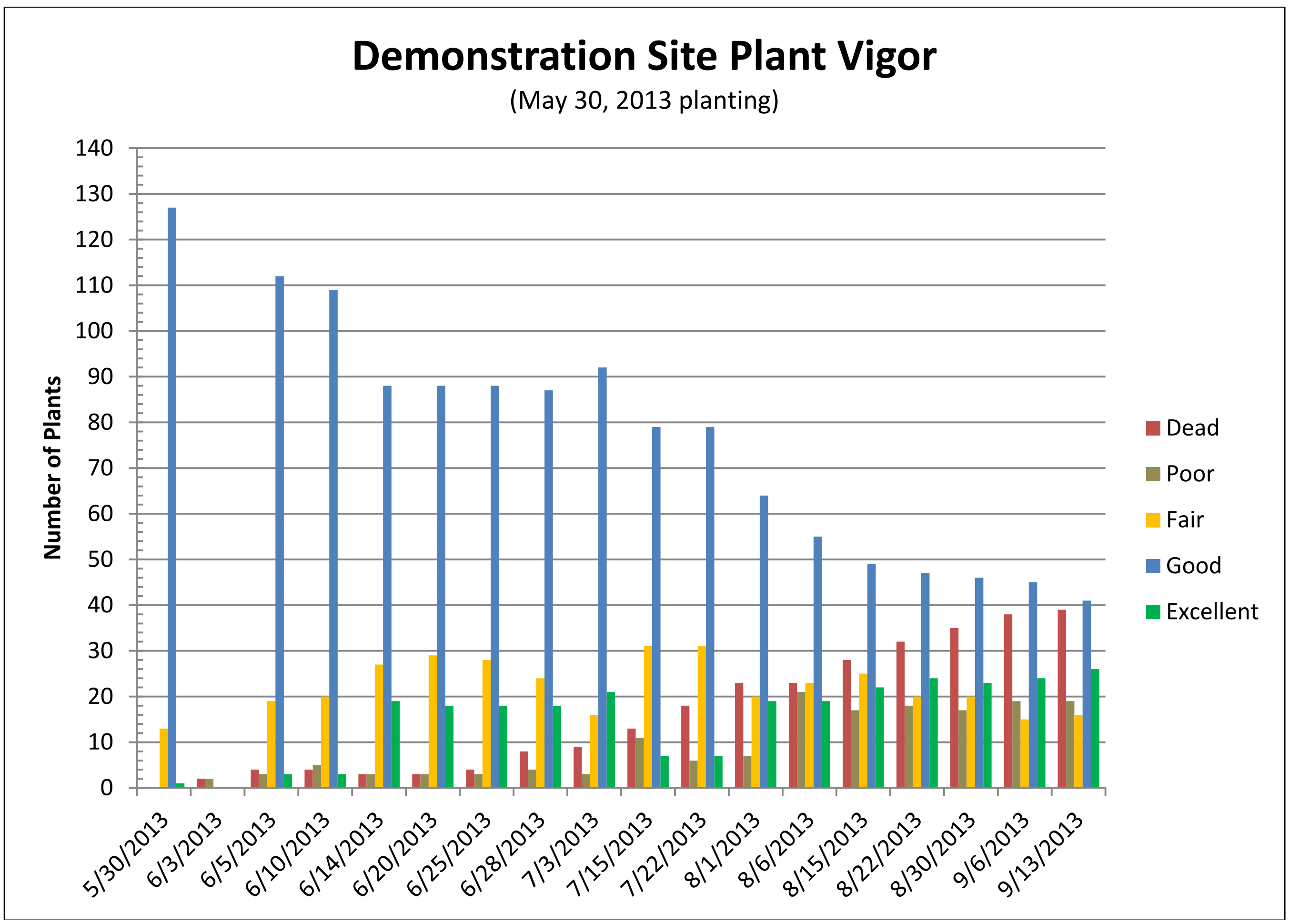


Figure 2. Plot showing the number of plants in each vigor ranking category through 9/13/2013.

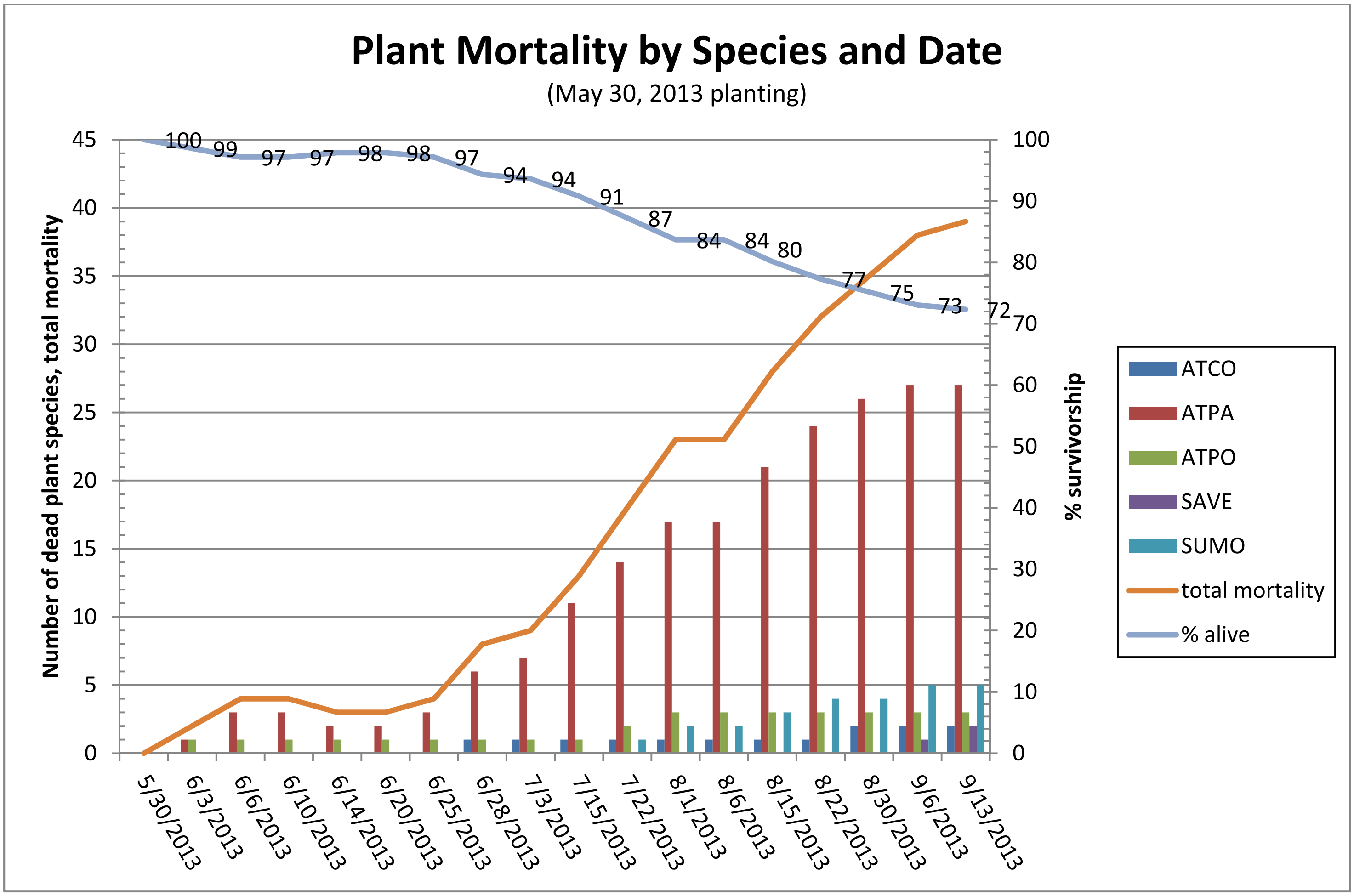


Figure 3. Plot showing the number of dead plants and total mortality (left axis) and percent survivorship (right axis) through September 13, 2013. The colored bars show the number of dead plants from each of the five species of native shrubs planted on the test site.

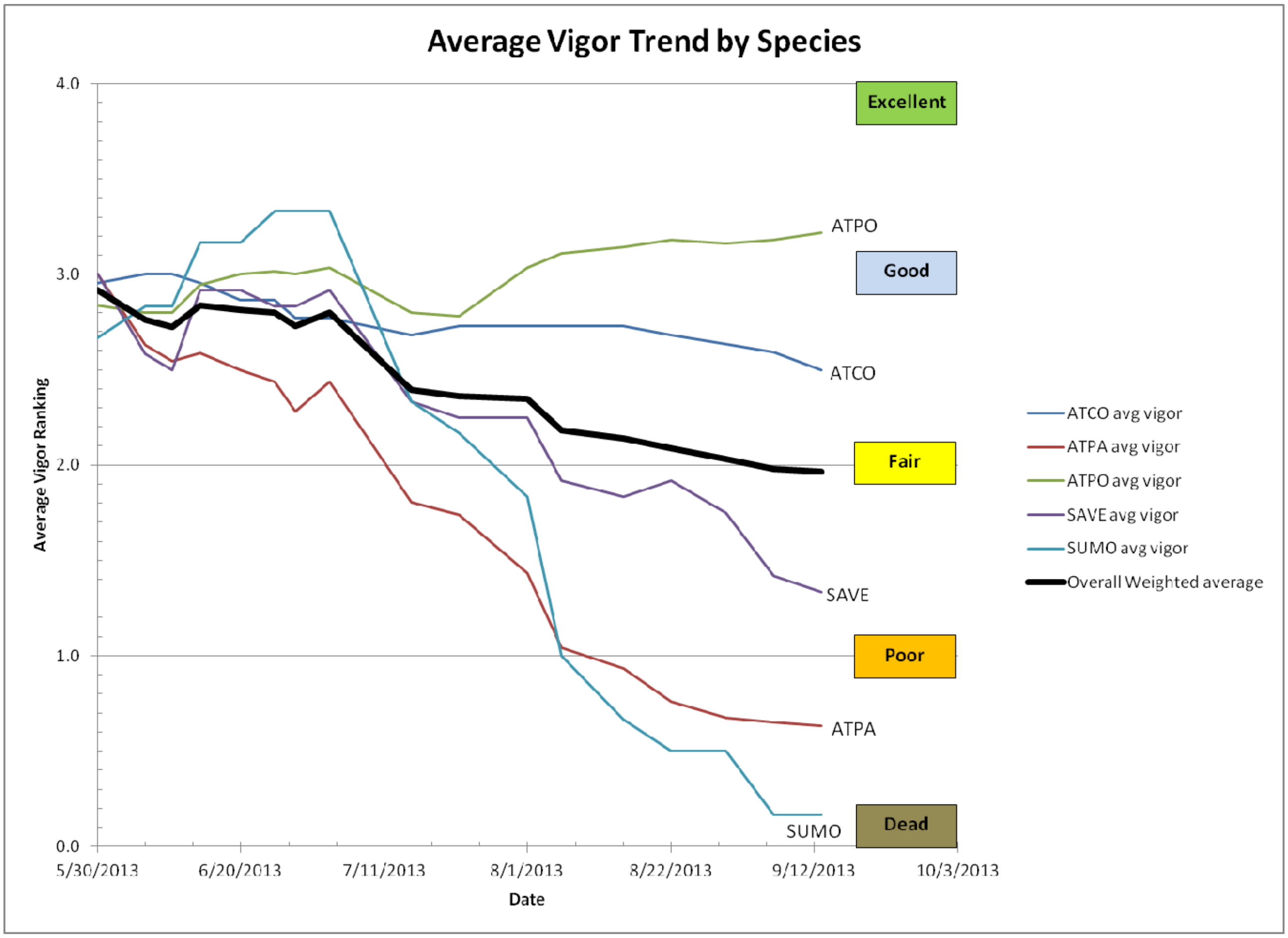


Figure 4. Plot of the average vigor ranking for each plant species from May 30, 2013 through September 13, 2013. An overall weighted average trend line is also provided. The ATPO and ATCO plants continue to have an overall high vigor ranking well above the weighted average line. ATPA and SUMO vigor has declined during the first 15 weeks of the test into an overall ranking of Poor.

Photo 12: Monitoring photos taken of the plants at Bale number 5 showing the plants from three dates from May to September 2013. The plants are numbered 1, 2, and 3 sequentially from left to right. On September 30, 2013 (bottom photo) the vigor rankings were Plant 1 (ATPO) = Excellent, Plant 2 (SAVE) = Good, and Plant 3 (ATCO) = Good

A) May 30, 2013: date of planting

B) July 17, 2013:

C) September 30, 2013: Notice the wire protective structure placed around the plants to prevent browsing impacts on the SAVE.

Photo 13: Monitoring photos taken of the plants at Bale number 8 showing the plants from three dates from May to September 2013. The plants are numbered 1, 2, and 3 sequentially from left to right. On September 30, 2013 (bottom photo) the vigor rankings were Plant 1 (ATCO) = Excellent, Plant 2 (ATPO) = Excellent, and Plant 3 (ATPA) = Dead

A) May 30, 2013: Notice the leggy structure of the ATPA on the right.

B) July 17, 2013

C) September 30, 2013: Notice the Excellent vigor of the ATCO and ATPO and that the ATPA is now Dead.

Photo 14: Monitoring photos taken of the plants at Bale number 47 showing the plants from three dates from May to September 2013. The plants are numbered 1, 2, and 3 sequentially from left to right. On September 30, 2013 (bottom photo) the vigor rankings for all three ATPO plants was Excellent.

A) May 30, 2013

B) July 17, 2013

C) September 30, 2013: Notice the continued growth of the ATPO from May to September.

Summary

Most desert restoration projects consider a survivorship rate of 50% or higher to be successful (Abella and Newton, 2009). So far this success level has been achieved on the Straw Bale Demonstration project within the first 2 ½ months of the project. Due to the time of planting, right before the extended hot period at the peak of summer season, District staff made extra effort to provide water and conditions suitable for plant success. This level of effort is not sustainable for the proposed large scale dust control project which has a foot print of approximately 200 acres.

The optimum time for planting in desert vegetation projects is in the fall season right before the plants go dormant for the winter. A second set of approximately 500 native plants were started from seed in April 2013 for planting on the test site in October 2013. This second planting will provide valuable information on plant survivorship as designed for the full scale project.

Two main issues of concern that were identified in the first set of plants on the bale project include browsing impacts and plant/root structure. In order to address these issues for the next set of plants being planted on the test site at the end of October 2013, the District is going to place protection structures around the plants at each bale that has a SUMO or SAVE when the plants are placed in the ground and is also having the new ATPA plants pruned to promote an upright stem structure. The District plans to continue monitoring the health of the existing plants on the test site as well as begin monitoring the health and establishment of the new plants schedule for placement in the ground in October.

References

Abella, S. R.and A.C. Newton. 2009. A systematic review of species performance and treatment effectiveness for revegetation in the Mojave Desert, USA. In *Arid Environments and Wind Erosion*, eds. A. Fernandez-Bernal & M. A. De La Rosa. Hauppauge, NY: Nova Science Publishers, 45-74.

Gillies, J. 2013. Using Roughness (Solid Elements and Plants) to Control Sand Movement and Dust Emissions: Keeler Dunes Dust Demonstration Project, Interim Report. Prepared by the Desert Research Institute for the Great Basin Unified Air Pollution Control District, September 26, 2013.