

**FINAL  
KEELER DUNES DUST MITIGATION PROJECT  
GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT  
SPECIFICATION NO. 14-03**

**Submitted to:**



**Bishop, California**

**Theodore Schade, PE  
Great Basin APCO**

**Submitted by:  
AMEC Environment & Infrastructure, Inc.  
San Diego, California**

**May 2014**

**NOTICE INVITING BID  
Bids Due by Noon June 2, 2014**

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## NOTICE INVITING BID

### **NIB-01. Receipt of Bids**

Sealed proposals (bids) for this project will be received and time-stamped by Great Basin Unified Air Pollution Control District (the District) no later than noon, June 2, 2014 (from time stamp clock) at which place they will be publicly opened at 1 PM.

Hand deliver/Fed Ex your bid to:

**Great Basin Unified Air Pollution Control District  
Board Clerk Desk  
Attn: Grace Holder  
157 Short Street  
Bishop, CA 93514  
(760) 872-8211**

Bids are received at the front office only. Please have your bids time-stamped by the District Front office staff.

### **NIB-02. Contract Documents**

Environmental documentation for this project can be found at the District website (<http://www.gbuapcd.org/keelerdunes/index.htm>). The project is being managed by Carla Scheidlinger of AMEC Environment & Infrastructure, Inc. (AMEC).

### **NIB-03. Location and Description of Work**

The work to be constructed is located at the Keeler Dunes, located to the northwest of the community of Keeler in Inyo County, California (Figure 1).

#### **Overall Project Description**

The goal of the Project is to temporarily stabilize the surface of a portion of the Keeler Dunes with straw bales; and then, by planting and irrigating native shrubs associated with those bales, to create a permanently stabilized vegetated dune environment that mimics natural environments such as the existing Swansea Dunes (located to the northwest) and other stable shoreline dunes in the region (found both at Owens Lake and Mono Lake).

#### **Project Area**

The Project will be implemented on 194 acres of the Keeler Dunes area. The District designed the Project to minimize environmental impacts by applying two different dust control levels at the project site (Figure 2). A dust control efficiency of 95 percent would be implemented on approximately 177 acres; and 85 percent control will be implemented on approximately 17 acres. It is possible, however, that implementation on the 17 acres of the 85 percent control area will not be conducted at this time. Descriptions of each major Project component, specifically straw bales, native vegetation with wire cage protection for certain species, and an irrigation structure are presented below. Approximate numbers of plants, straw bales, and wire cages for plant protection necessary to achieve an estimated 85 and 95 percent dust control efficiency on a total of 194 acres are summarized in Table 1.

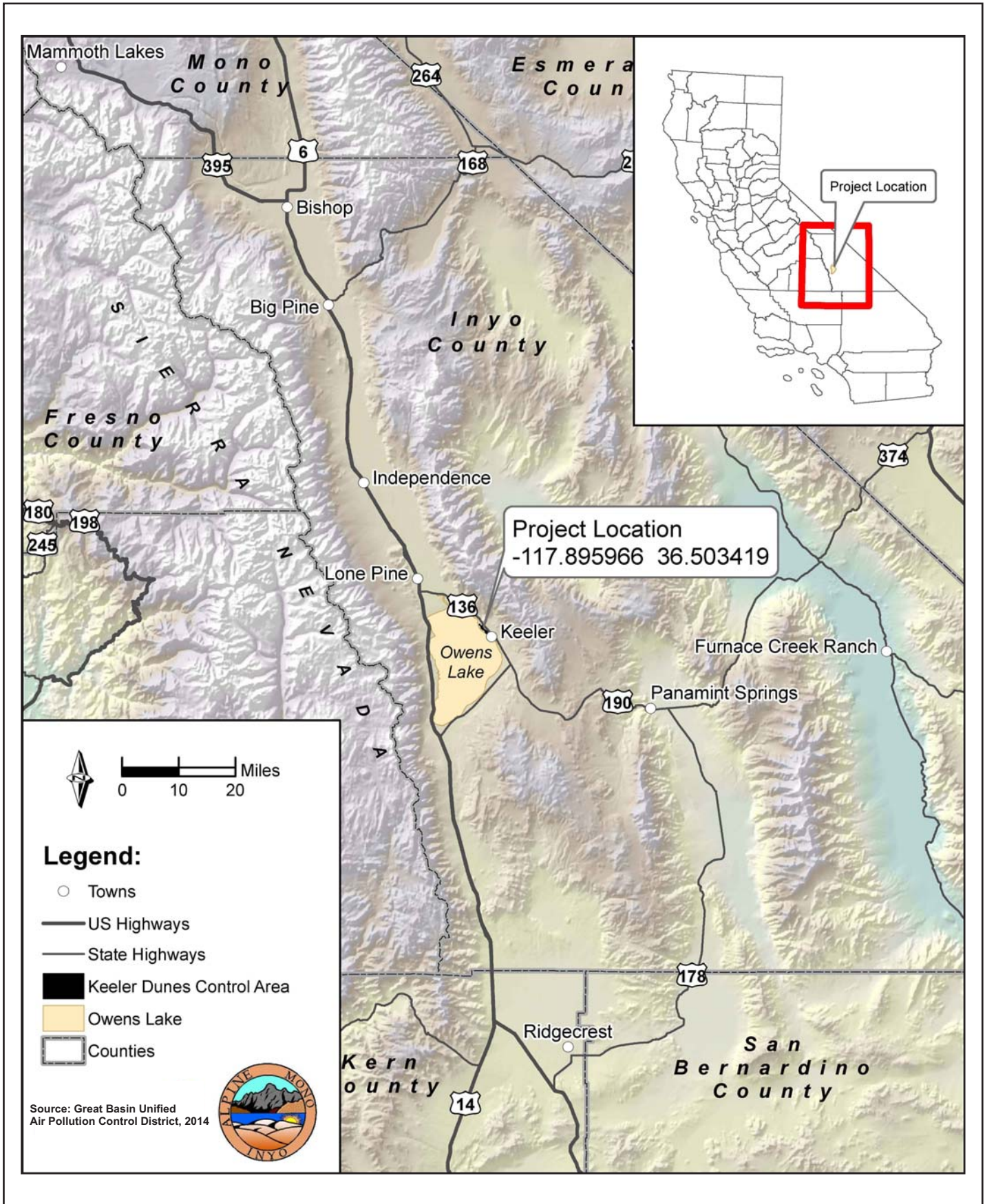
**Table 1.**  
**Proposed Project / Proposed Action Dust Control Applied to 194 Acres**

<b>Element</b>	<b>Minimum Control Efficiency (%)</b>	<b>Number of Acres</b>	<b>Number Required per Acre</b>	<b>Total Number Required</b>
Native plants	95	177	1,983	350,991
Native plants	85	17	1,092	18,564
<b>Total plants</b>				<b>369,555</b>
Straw bales*	95	177	661	116,997
Straw bales	85	17	364	6,188
<b>Total straw bales</b>				<b>123,185</b>
Wire cages **	95	177	198	35,046
Wire cages	85	17	109	1,854
<b>Total wire cages</b>				<b>36,900</b>

Notes:

\* The dimensions of the straw bales are approximately 23 x 15 x 48 inches

\*\* The dimensions of the wire cages are approximately 12 x 36 inches



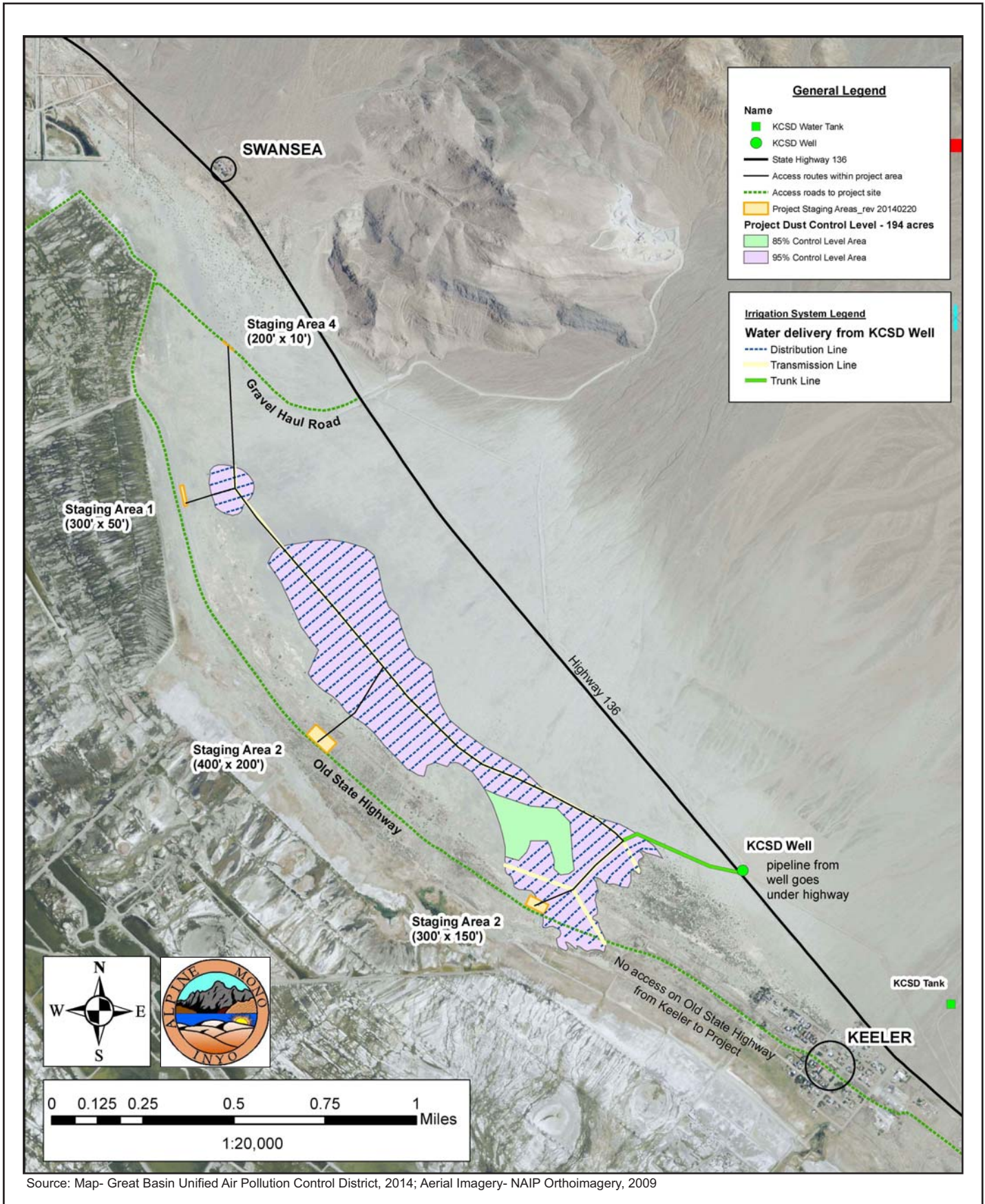
**Regional Vicinity Map**  
**Keeler Dunes Dust Mitigation Project**  
**Great Basin Unified Air Pollution Control District**

**FIGURE**

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**Project Overview**  
**Keeler Dunes Dust Mitigation Project**  
**Great Basin Unified Air Pollution Control District**

**FIGURE**  
**2**



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## Project Elements

Other project elements consist of activities and infrastructure components, including

1. establishment of four temporary staging areas for equipment;
2. development of temporary access routes;
3. development of water supply infrastructure, including directional drilling under SH 136 from the Keeler Community Services District (KCSD) well

Permits required for the implementation of the project have been acquired, or will be available to the successful bidder. Permits currently completed are in Attachment A.

### **1. Staging Areas**

Four temporary staging areas will be established to provide contractor(s) with storage and placement of equipment and straw bales, native plants, and supplies. The staging areas will be located on land near the project area (locations shown in Figure 2). The areas will be established by brushing the areas to be used; no grading or earthmoving is necessary or permitted. The total area of the proposed staging areas is approximately 3.3 acres. A portion of each staging area will have standard fencing installed to secure materials and equipment as deemed necessary by the Contractor.

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, the staging facility will measure 300 x 50 feet in area and will be used by the Contractor for the storage of equipment, fuel, all-terrain vehicles (ATVs), native plants, and other supplies.

Staging Area 2 will be established along the east side of the Old State Highway on land managed by the LADWP. This is designed to be the main staging area and provides access to the central portion of the project. The staging facility will measure 200 x 400 feet and will be used by the Contractor for the storage of equipment, fuel, all-terrain vehicles (ATV's), native plants, straw bales and other supplies. It is also anticipated that the Staging Area 2 will serve as an employee parking lot.

Staging Area 3 will be established for the Project along the Old State Highway, on land managed by the BLM. This area will be used for the temporary storage of equipment and materials needed for the southern portion of the Project area. Staging Area 3 is 150 x 300 feet and will be designed in such a manner as to allow a turn-around for delivery trucks.

Staging Area 4 will be established along the edge of the gravel haul road constructed by the LADWP for dust mitigation on the Owens Lake, adjacent to the turn-off from SR 136. The area will measure approximately 10 x 200 feet and will be used primarily for temporary straw bale and plant storage.

The Staging Areas will require the removal of some vegetation (brushing) in order for them to function. These Staging Areas will be restored and revegetated by the Contractor after the

Project has been completed. The Storm Water Pollution Prevention Plan (SWPPP) will be prepared by the District. The contractor will be responsible for implementing the required Best Management Practices (BMPs); the District will conduct the required monitoring.

## **2. Access Routes**

Designated temporary access routes 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; no conventional trucks may be used. The temporary access routes have been sited to minimize impacts to existing vegetation and avoid cultural resources. The temporary access routes will be laid out by the Contractor under supervision of District staff or consultants by laying out alignments that avoid vegetation to the maximum extent practicable. Where vegetation blocks access to a requisite location, selected modification of vegetation may be undertaken to top vegetation to accommodate clearance for ATVs. No grading or use of supplemental materials such as asphalt or gravel will be permitted for these routes. Following completion of planting and watering activities, the temporary access routes will be restored as necessary by seeding with native plants.

The temporary access routes from all of the staging areas will total approximately 13,479 feet long (2.5 miles) by 20 feet wide following the existing grade. The approximate location of access routes is shown in Figure 2.

## **3. Water Supply, Conveyance, and Distribution**

Irrigation will be required for the plants at the time of planting, and for three years post-planting. The water for plant irrigation will be supplied from the Keeler Community Services District (KCSD) production well, located northeast of Highway 136 northwest of Keeler (Figure 2). A tie-in will be made to the well, and a pump dedicated to the irrigation system will be installed. A 6 inch PVC pipe with 12 inch steel conduit casing (see Specifications in Attachment B) will be inserted under SH 136 using directional drilling, and a 4 inch PVC trunk line will continue on the ground surface to the southeast boundary of the project approximately 1800 feet away. A drilling plan is found in Attachment B (Specifications). The design of the irrigation system is also in the Specifications in Attachment B.

Delivery of water from the trunk line to the plants on the Project will be completed via a temporary above ground irrigation system installed to deliver water to the project area where watering would be necessary. The main trunk line, which will be painted with a landscape-compatible color as specified by BLM, will connect to a transmission line that would include a manifold of smaller diameter lateral pipes. These lateral pipes will extend across the project area at a spacing of approximately 160 feet apart, with hose attachments spaced along each pipe at approximately 160 foot intervals. Hoses conveyed to each attachment using an ATV will be used to deliver water to each individual planting site. A conceptualized schematic is shown in Figure 2 with detailed specifications shown in Attachment B. These specifications include the tie-in to the KCSD well, and the specifications of a booster pump designed to provide pressure through the system shown.



#### **4. Straw Bales**

The Project will utilize certified weed-free straw bales (23 x 15 x 48 inches or similar size) installed in an irregular pattern across the project area. The irregular pattern consists of bales distributed in a configuration that mimics that of native vegetation. Within this irregular pattern, the bales will be placed such that their long dimension is oriented in a preferred direction as specified by the District. The bales will be placed and left intact on the dune surface.

The bales will have been purchased by the District and will be delivered to the site by the supplier(s) at District cost. Delivery dates will be coordinated by the Contractor with the supplier(s). Twenty thousand bales have been purchased for delivery in August and September 2014 with the remainder to be delivered starting in October 2014.

Placement of the bales will be done using a GIS database provided to the Contractor by the District that will show the location of each bale required. The distribution of bales in the Test Area is shown in Figure B2 in the Specifications section. Straw bales are anticipated to degrade over a period of several years and will provide organic material to the existing soil.

#### **5. Native Vegetation**

This component of the Project involves establishing a mix of native vegetation in association with the straw bale placement. Native vegetation to be planted includes five species of native desert shrubs. Species to be used are *Atriplex confertifolia* (shadscale saltbush), *Atriplex polycarpa* (cattle saltbush), *Atriplex parryii* (Parry saltbush), *Sarcobatus vermiculatus* (greasewood), and *Sueda moquinii* (inkweed). All seed for this project was collected from local sources.

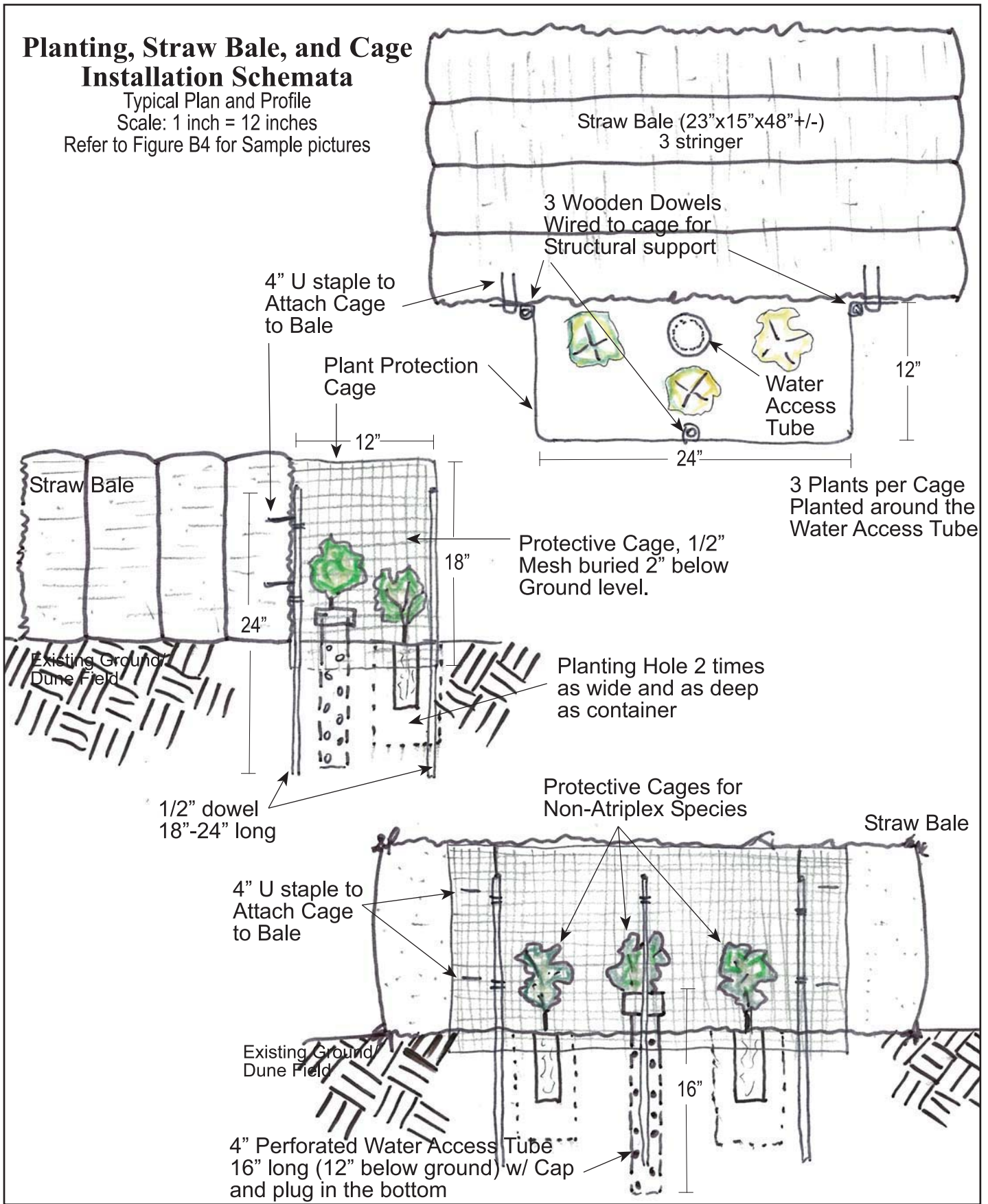
Native plants will have been cultivated at the Antelope Valley Resource Conservation District Nursery in Lancaster, CA, and will be approximately 6 - 7 inches in height and will be in containers measuring 2" x 2" x 10". Delivery of these plants from the nursery will be at the cost of the Contractor. 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 3 native plants along the base of each straw bale, in a configuration that will include a watering access tube. Following planting, plants will be watered with an additional 3 gallons of water per planting location. Non-*Atriplex* species that are vulnerable to animal damage will be protected with a wire cage, provided by and installed by the Contractor. Supplemental watering will be conducted twice per year with each event consisting of approximately 3 gallons per planted location. Supplemental water events will occur in the spring (April-May) and in the fall (September-October) in 2015, 2016 and 2017.

Specifications for planting, access tube installation, cage installation, and watering are shown in Figure 3, and in Attachment B: Specifications.

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# Planting, Straw Bale, and Cage Installation Schemata

Typical Plan and Profile  
 Scale: 1 inch = 12 inches  
 Refer to Figure B4 for Sample pictures



**Planting, Straw Bale, and Cage Schemata  
 Keeler Dunes Dust Mitigation Project  
 Great Basin Unified Air Pollution Control District**

**FIGURE**

**3**

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## Schedule

Installation of the Project should require up to 6-8 months to complete, from August 2014 through January-March 2015. Construction of the Project would be divided into the following parts:

1. development of temporary access routes and staging areas;
2. installation of irrigation system, including directional drilling under SR 136;
3. bale placement, planting and watering;
4. project oversight and monitoring; and
5. supplemental watering and planting (project operation and maintenance) for a period of 3 years.

Supporting project activities will include placement of straw bales, plant delivery, planting, initial water delivery to plants and bales, and ongoing irrigation for three years. Site preparation and implementation of the Project will be undertaken in accordance with all federal, state, and County of Inyo codes and regulations.

## Access and Egress

Site ingress and egress for construction, delivery vehicles, haul routes, and emergency response and evacuation will be from SR 136 via the existing Gravel Haul Road and the Old State Highway (Figure 2).

Vehicular travel within the project area will be restricted to the designated access routes as much as possible. However, 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 and distribute the bales and plants. From 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 project. During installation and removal of the temporary irrigation system and during irrigation events, ATV travel will be allowed along the path of the irrigation laterals.

No ATV travel will be permitted in the areas shown as 85% control in Figure 2. Within this area, all material must be transported by hand along approved designated routes.

## Other Considerations

- Where the GIS database indicates that a bale should be placed and a shrub of approximately the dimensions of the bale, or larger, is already present, no bale or plant placement will be necessary. If a shrub is present but too small, the bale will be placed to the side of the existing shrub.

- The allowable difference in placement from the GIS point to the actual bale placement may be up to 3 feet.
- The allowable difference in orientation of the bale from the specified orientation may be up to 15 degrees.
- In areas that are devoid of sand at the time of the work, no bale placement will be necessary. Recent aerial photos will be provided immediately prior to implementation that show the location and number of acres within the project footprint that include this condition. This condition would reduce the number of bales and plants that would need to be used by approximately 660 bales and 2,000 plants per acre.
- A cultural monitor will be required for work in all areas that include culturally significant resources. That area will be described at the time of the bid walk.

#### **NIB-04. Mandatory Pre-Bid Walk-Through**

There will be a mandatory pre-bid project tour to be conducted on May 9, 2014. The tour will begin at 1:00 PM at the LADWP Sulfate Road office located at 111 Sulfate Road, Keeler, CA.

- **QUESTIONS:** All questions must be submitted to the District's consultant, AMEC Environment & Infrastructure, Inc. by email at [carla.scheidlinger@amec.com](mailto:carla.scheidlinger@amec.com).

#### **NIB-05. Contract Bonds**

All bonds shall be executed by admitted surety insurers, as defined in Code of Civil Procedure section 995.120. The Contractor shall furnish a faithful performance bond in an amount equal to 100% of the amount of the contract and a labor payment bond in an amount equal to 100% of the contract amount.

**Pursuant to Section 995.660(a) of the Code of Civil Procedure, the Contractor shall submit the following documents with the performance and payment bonds:**

1. The original, or a certified copy, of the unrevoked appointment, power of attorney, bylaws, or other instrument entitling or authorizing the person who executed the bond to do so;
2. A certified copy of the certificate of authority of the insurer issued by the State of California's Insurance Commissioner; and
3. Copies of the insurer's most recent annual and quarterly statements filed with the Department of Insurance.

**NO PAYMENT SHALL BE MADE UNTIL THE BONDS ARE APPROVED BY THE GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT**

#### **NIB-06. Safety**

Safety of all activities in connection with the work is of paramount and overriding importance to the District. The District supports the California Occupational Safety and Health Administration (Cal OSHA) California Voluntary Protection Program (Cal VPP). Bidders on this project will be required to comply with and meet all applicable Cal OSHA requirements of Title 8 of the

California Code of Regulations, including their current Injury and Illness Prevention Plan, T8 CCR Section 3203.

All bidders shall complete the C-16 Annual Summary of Work Related Injuries and Illness (Cal/OSHA Form 300A) and the C-17 Contractor's Cal/OSHA Compliance History and SIC Code form. *Failure to fully divulge, complete and submit these forms may deem your bid non-responsive.*

A safety conference shall be scheduled prior to the preconstruction conference to review the experience modification rating, the respective safety requirements, and to discuss implementation of all health and safety provisions related to this project.

### **NIB-07. Contract Time**

No bid or bid security may be withdrawn for sixty (60) calendar days after the date bids are received. The successful bidder shall, within seven (7) calendar days after the District mails a notice of acceptance of bid, return the signed agreement and bonds, and attend the preconstruction conference at the District's Keeler office. The contract period shall commence seven (7) calendar days from the date of the Notice-of-Acceptance-of-Proposal.

### **NIB-08. Contractor Classification**

Bidders on this work will be required to be licensed by the State of California as Classification A - General Engineering Contractor at the time of the bid and at the time of award as such license is defined in Section 7056 and/or Section 7058 of the Business and Professional Code and Section 732 of the California Administrative Code.

### **NIB-09. Non-Discrimination**

Bidders on this work will be required to comply with the provisions of the California Labor Code and with the President's Executive Order No. 11246 and supplements thereto. The requirements for bidders and contractors under this order are explained in the specifications.

### **NIB-10. Minimum Wages**

In accordance with the provisions of the California Labor Code, the Director of Industrial Relations has ascertained the general prevailing rates of wages and the general prevailing rates for legal holiday and overtime work in Inyo County. The successful bidder shall post a copy of such determinations at the jobsite. It is expected that the applicable wage category for labor on the project is Landscape/Irrigation Tradesman. Appropriate wage categories should be utilized for specialty work such as the directional drilling.

### **NIB-11. Public Works Requirements**

California Administrative Code, Title 8, Group 3, Section 16100 apply, which are/include:

- A. All applicable requirements of sections 1771, 1774, 1775, 1813, and 1815;
- B. The appropriate number of apprentices are on the job site, as set forth in Labor Code Section 1777.5;
- C. Workers' compensation coverage, set forth in Labor Code Sections 1860 and 1861;

- D. To keep accurate records of the work performed on the public works project, as set forth in Labor Code Section 1812;
- E. Inspection of payroll records pursuant to Labor Code Section 1776, and as set forth in Section 16400 (e) of these regulations; and
- F. Other requirements imposed by law.

#### **NIB-12. Substitution of Securities**

Substitution of securities shall be permitted for any monies withheld to ensure contract performance, in accordance with the provisions of law and Section F-General Conditions of the contract specifications.

#### **NIB-13. Ineligibility of Contractor or Subcontractor**

Pursuant to Section 1777.1 and 1777.7 of the Labor Code, any contractor or subcontractor who is found by the Labor Commissioner to be in violation of certain provisions of law and is debarred for a specific period of time, is ineligible to bid or work on, or be awarded, a public works contract.

#### **NIB-14. Standard Conditions**

Funding for this work program will be issued through the District. Contractor will be required to comply with all conditions included in the contract.

#### **NIB-15. Payment Compensation**

Contractor shall be compensated in proportion to the work completed during a billing period.

Contractor shall submit to AMEC for review and for conformance with work specifications a monthly itemized statement which indicates work completed by task and other reports as required by the contract executed between the District and the successful contractor. The billing statement shall describe the amount of services and supplies provided since the initial commencement date, or since the start of the subsequent billing periods, as appropriate, through the date of the statement. Payment of invoices is due within 40 (forty) days of AMEC's receipt of the invoice, which will be forwarded within 10 days of receipt to the District for payment.

Payments prior to satisfactory completion of all work required of this Contract Agreement, shall not exceed, in the aggregate, ninety percent (90%) of the total earned to date. All retention shall be paid upon satisfactory completion of the Project, as otherwise provided herein.

#### **NIB-16. Drawings and Maps**

Drawings, maps, and additional specifications along with permitting documents are included as Attachments A and B.



### **NIB-17. Other Information to be Provided**

The District will provide the following documents to the successful bidder:

- SWPPP documents
- Encroachment permit from CalTrans
- Land Use (Right of Way) permit from BLM
- Land and road use authorization letter from LADWP
- Water Use Agreement with KCSD
- Weed Control Plan
- Worker Environmental Awareness Plan (WEAP)
- Restoration Plan for Staging Areas and Temporary Access Routes

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## **INSTRUCTIONS TO BIDDERS**

### **BI-01. Form of Proposal and Signature**

The proposal shall be submitted on the form provided by the District and shall be enclosed in a sealed envelope marked and addressed as hereinafter directed. The Bidder shall state in words and figures the unit prices or the specific sums as the case may be, for which he proposes to supply the labor, materials, supplies, or machinery, and perform the work required by the specifications and drawings. In case words and figures do not agree, the words shall govern and the figures shall be disregarded. If the unit price and the total amount named by a Bidder for any item are not in agreement, the unit price alone will be considered as representing the Bidder's intention and totals will be corrected to conform thereto. The District reserves the right to correct any arithmetical errors. If the proposal is made by an individual it shall be signed and his full name and address shall be given; if it is made by a Firm it shall be signed with the co-partnership name by a member of the firm, who shall also sign his own name, and the name and address of each member shall be given; and if it is made by a corporation the name of the corporation shall be signed by its duly authorized officer or officers, and the names and titles of all officers of the corporation shall be given. No telegraphic proposal or telegraphic modification of a proposal will be considered. **Bids submitted by FAX are not acceptable.**

### **BI-02. Preparation of the Proposal**

Blank spaces in the proposal shall be properly filled. The phraseology of the proposal must not be changed and no additions shall be made to the items mentioned therein. Conditions, limitations or provisos attached to a proposal will cause its rejection. Alterations by erasure or interlineation must be explained or noted in the proposal over the signature of the Bidder. Alternative proposals will not be considered unless specifically provided for in the Bidding Sheet. A Bidder may withdraw his proposal before the hour fixed for opening bids, without prejudice to himself, by submitting a written request to the APCO of the District for its withdrawal, and his proposal will be returned to him unopened when reached in the procedure of opening bids without rendering the accompanying certified or cashier's check or bond subject to forfeiture as liquidated damages in like manner as in the case of failure to execute contract after award, as hereinafter provided. No proposal received after the time named or at any place other than the place stated in the Notice Inviting Bids (or Bidding Information sheet) will be considered. All bids will be opened and declared to be present at the opening. The District reserves the right to waive any informality in any bid, to reject any or all proposals, to reject one part of a proposal and accept the other, and to make award to the lowest responsible Bidder as the interest of the District may require. Specifics for the preparation of the proposal are found in Section Proposal Requirements.

### **BI-03 Non-Collusion Declaration and the Subcontractors List**

The Non-Collusion Declaration and the Subcontractor List naming each subcontractor who will perform work or labor or render service to the Contractor in an amount in excess of one-half of one percent (1/2 of 1%) of the Contractor's total bid shall be submitted with the proposal at time of bid.

### **BI-04. Surety**

The Bidder shall name in his proposal the surety or sureties, which have agreed to furnish said bonds.

**BI-05. Certified or Cashier's Check or Bond**

All bids shall be accompanied by a bidder's security in the amount equal to at least ten percent (10%) of the bid. The security shall be in the form of a cashier's check made payable to the District, a certified check made payable to the District, or a bidder's bond, executed by an admitted surety insurer, made payable to the District. If the successful bidder fails to execute the contract within thirty days after award by the District, the bidder's security shall be forfeit to the District.

**BI-06. Address and Marking of Proposal**

The envelope enclosing a proposal MUST be sealed and addressed as follows:

**Great Basin Unified Air Pollution Control District  
Front Office  
Attn: Grace Holder  
157 Short Street  
Bishop, CA 93514  
(760) 872-8211**

The envelope MUST be plainly marked in the upper left hand with the name and address of the bidder, and bear the words:

**Proposal For:**    (name of work)  
                          (date and hour)  
                          (specification number)

The statement of Bidder's experience and financial condition, when required, if not already on file in the District Office should be enclosed in the same envelope with the proposal.

**BI-06. Lowest Responsible Bidder**

In selecting the lowest responsible Bidder, consideration will be given to the general competency of the Bidder for the performance of the work covered by the proposal, and the bidder's financial standing, if requested. To receive favorable consideration, a bidder must present evidence satisfactory to the District that he or his associates are personally competent to manage the proposed undertaking and to carry it forward to a successful conclusion. Professional integrity and honesty of purpose shall be essential requirements. A showing of adequate financial resources may be requested by the District, but will not alone determine whether a bidder is competent to undertake the proposed work. Each bidder must furnish a record of past performance and experience in the form required. To this end, each proposal, except as noted below, shall be supported by a statement of the bidder's experience on the form provided. This form, completely filled out, must be submitted along with the proposal. Incomplete or false statements submitted in connection with a proposal may, at the option of the Board of Directors of the District, be sufficient cause for its rejection. The District shall be the final authority with regard to whether a bid is responsive to the call for bids and as to whether a bidder is a responsible bidder under the conditions of his bid. The District, at its discretion, may reject all bids.

### **BI-07. Equalizing Factors**

Whenever applicable, equalizing elements or factors not specifically mentioned or provided for herein, such as costs of transportation, inspection (including salaries and travel and subsistence expenses), installation, and operation, or any other factor or element in addition to that of price which would affect the total cost or value to the District will be taken into consideration in comparing bids for award of contract.

### **BI-08. Execution of Contract**

A Bidder to whom the award is made shall execute and return a written contract with the District on the form of Agreement attached hereto and furnish good and approved bond as required in the following paragraph, all in accordance with the provisions hereof and within the time stated in the Notice Inviting Bids (or Bidding Information sheet) or such additional time as may be allowed by the Engineer. The District will return a copy of the fully executed contract upon completion by the District Governing Board. If a Bidder to whom the award is made fails or refuses to enter into contract as herein provided, or to conform to any of the stipulated requirements in connection therewith, his check shall become the property of the District as provided in Section BI-5 hereof, the award will be annulled, and in the discretion of the District an award may be made to the Bidder whose proposal is next most acceptable to the District; and such Bidder shall fulfill every stipulation embraced herein as if he were the party to whom the first award was made. A corporation to which an award is made will be required, before the contract is finally executed, to furnish evidence of its corporate existence and of the District of the officer signing the contract and bond for the corporation to so sign.

### **BI-9. Complete Specifications and Drawings**

It shall be the responsibility of the Bidder to verify the completeness of his set of specifications and drawings and neither the District nor any of its officers shall be held responsible for any omission therefrom unless such omission has been called to the attention of the District prior to the submission of bids.

### **BI-10. Addenda and/or Letter of Clarification**

Bidder shall be responsible for verifying that any addenda or letter of clarification issued by the District has been investigated and received. By submitting a bid, Bidder certifies that any addenda and letters of clarification issued to these specifications, whether acknowledged or not on the Bidding Sheets, shall be made a part of the contract. Bidder further agrees to perform all labor and services and furnish all materials, tools and appliances necessary for completing the work called out in the addenda or letter of clarification at no additional cost to the District.

### **BI-11. Improperly Balanced Proposals**

Any proposal which in the opinion of the Project Manager is so unbalanced between the various contract items as to be detrimental to the interests of the District will be rejected.

### **BI-12. Local Conditions**

Bidders shall read the specifications, any background material, examine the drawings, and make their own estimates of the existing facilities and the difficulties which will attend the execution of the work called for by the proposed contract, including local conditions, uncertainty of weather, and all other contingencies. The District will identify for Bidders the location of existing utilities or resources located on the site of construction which require removal,

relocation or protection. **AN EMPLOYEE ON THE COMPANY'S PAYROLL MUST HAVE INSPECTED THE SITE OF THE PROPOSED WORK TO BE CONSIDERED A RESPONSIVE BIDDER.** Bidders shall satisfy themselves by personal examination of the locations of the proposed work, and by such other means as they may choose as to actual conditions and requirements and as to the accuracy of the quantities stated in the Bidding Sheet. Information derived from the maps, plans, specifications, profiles, or drawings, or from District personnel, shall not relieve the bidder of this responsibility, and the interpretation of the data disclosed by borings or other preliminary investigations is not guaranteed by the District.

The quantities of work or materials stated in the unit price items of the Bidding Sheet are given only as a basis for the comparison of bids and the District does not expressly or by implication agree that the actual amount of work or material will correspond therewith, but reserves the right to increase or decrease the amount of any unit price item of the work as may be deemed necessary or expedient by the Project Manager. Bidders shall not at any time after the submission of a bid make or have any claim for damages or anticipated profits or loss of profit or otherwise because of any difference between the quantities of work actually done and material furnished and those stated in said unit price items of the Bidding Sheet.

### **BI-13. Submittals**

Prior to initiating any work, the successful bidder shall submit to the District for approval the following documents:

- A QA/QC Plan. This will show the methods to be used for assuring accuracy in placement of bales, of compliance with planting specifications, and with compliance with water delivery requirements.
- A Project-specific Safety Plan
- A Fugitive Dust Control Plan, to comply with District Rules 400 and 401 through the application of BACMs during project implementation
- A Project Schedule
- A Values Schedule, showing what expenditures are anticipated to be submitted for invoicing on a monthly basis
- All bonding and insurance information as specified below
- HMBP (Hazardous Material Business Plan)
- SPCC Plan (Spill Prevention Control and Countermeasure Plan)

### **BI-10. Bond**

The contractor awarded the contract shall execute a bond for the faithful performance of the contract in the amount of one hundred percent (100%) of the contract amount and a payment bond for labor and materials in the amount of one hundred percent (100%) of the contract amount.

### **BI-14. Insurance**

Attention is invited to the requirements set forth in INSURANCE AND BONDS on page I-1.

## **BIDDING SHEETS**

Under these Specifications, the Contractor shall construct the project under these Specifications all in conformance with the Contract Drawings listed in Attachment B (Specifications).

The District reserves the right to:

- A. Accept or reject any or all bids on this specification;
- B. Award Contract to the lowest qualified bidder, based on the total bid price; and
- C. Waive any defects and informalities.

The District shall be the final AUTHORITY with regard to whether a bid is responsive to the call for bids and to whether a bidder is a responsible bidder under the conditions of his bid, or for any reason.

The total contract price shall include all work, materials and equipment needed to complete the project as defined in the Standard Conditions, Page SC-1. The bidder shall include costs for such other items in the most appropriate category (bid item).

**BASIS OF AWARD:** Award will be made to the lowest bidder that meets all the requirements set forth in the specifications. If two or more bids meet all the requirements and are the lowest, the District will select the successful bidder by lot.

Time to start: July-August 2014 (exact date to be determined by date of District's July Board meeting).

**GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT  
 SPECIFICATION NO. 14-03  
 KEELER DUNES DUST MITIGATION PROJECT**

**BIDDING SHEETS**

<b>Bid</b>			<b>Description</b>	<b>Unit Price</b>	<b>Total</b>
<b><u>Item</u></b>	<b><u>Qty</u></b>	<b><u>Unit</u></b>	<b><u>(Unit Price Written in Words</u></b>	<b><u>(Figures)</u></b>	<b><u>(Figures)</u></b>
1	1	LUMP	Mobilization and de-mobilization. To include sanitation and waste management. Provide Not To Exceed Total Price based on estimated Unit Quantity.	_____ \$	\$ _____
			(words)		
2	1	LUMP	Furnish and install all materials associated with the water supply connection at Keeler Well, and perform directional drilling under SH 136 as shown in Specifications. Provide Not To Exceed Total Price based on estimated Unit Quantity.	_____ \$	\$ _____
			(words)		
3	1	EACH	Furnish and install an irrigation system as shown in the drawings, including hose connections every ~150 feet along the pipes and a water meter. Based on Estimated Unit Quantity.	_____ \$	\$ _____
			(words)		
4	123,492	EACH	Transport from staging areas to project and install at the specified locations certified weed-free straw bales, dimensions as shown in Project Description. Provide Not To Exceed Total Price Based on Estimated Unit Quantity	_____ \$	\$ _____
			(words)		



**GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT  
 SPECIFICATION NO. 14-03  
 KEELER DUNES DUST MITIGATION PROJECT**

**BIDDING SHEETS**

5	369,555	EACH	Transport from the nursery and to the designated site, and install plants, including the pre-irrigation and post-planting irrigation required, using Specifications provided in Attachment B. Provide Not To Exceed Total Price Based on Estimated Unit Quantity  _____ \$ _____ \$ _____ (words)
6	123,185	EACH	Furnish and install 4" diameter water access tubes for plant irrigation. One tube will be installed at each bale. Provide Not To Exceed Total Price Based on Estimated Unit Quantity  _____ \$ _____ \$ _____ (words)
7	30,797	EACH	Furnish and install plant protection cages for all plant groups containing <i>Sarcobatus vermiculatus</i> and/or <i>Sueda moquinii</i> . Provide Not To Exceed Total Price Based on Estimated Unit Quantity  _____ \$ _____ \$ _____ (words)
8	6	EACH	Supplemental irrigation for all plants during the establishment period According to Specifications in Project Description. Provide Not To Exceed Total Price Based on Estimated Unit Quantity  _____ \$ _____ \$ _____ (words)

**GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT  
 SPECIFICATION NO. 14-03  
 KEELER DUNES DUST MITIGATION PROJECT**

**BIDDING SHEETS**

9	1	LUMP	Provide cultural monitor (assume 30 days of work). Provide Not To Exceed Total Price Based on Estimated Unit Quantity <hr/> (words)	\$			
10		LUMP	Decommissioning: Removal of irrigation system, plant protection cages, and watering tubes; and staging area and temporary access route restoration. To be done at completion of project. Provide Not to Exceed Total Price Based On Estimated Quantity <hr/> (words)	\$		\$	

TOTAL NOT TO EXCEED BID (AND BASIS OF AWARD)	\$ _____
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Addenda and/or Letter of Clarification By submitting a bid, bidder certifies that any addenda and letters of clarification issued to these specifications, whether acknowledged or not below, shall be made a part of the contract. bidder further agrees to perform all labor and services and furnish all materials, tools and appliances necessary for completing the work called out in the addenda or letter of clarification.
Addenda Received: _____ Letter of Clarification Received: _____

Person who inspected site of the proposed work as an employee of your firm: (***Representative must have inspected the jobsite and be an employee on the company's payroll to be considered a responsive bidder***)

\_\_\_\_\_  
 (Name)

\_\_\_\_\_  
 (Date of Inspection)

### LIST OF DESIGNATED SUBCONTRACTORS

In compliance with the provisions of Sec. 4100-4111, inclusive, of the Public Contract Code of the State of California, and any amendments thereof, each bidder shall set forth below: (a) The name and the location of the place of business of each subcontractor who will perform work or labor or render service to the Contractor in or about the construction of the work or improvement in an amount in excess of one-half of one percent (1/2 of 1%) of the Contractor's total bid; and (b) the portion of the work which will be done by each such subcontractor. Each subcontractor shall possess, both at the time the bid is submitted and at all times when work is performed, a valid contractor's license for the appropriate classification necessary to perform the work for which that subcontractor is listed.

LIST BELOW THE COMPLETE NAME, BUSINESS ADDRESS, LICENSE #, DESCRIPTION OF WORK, AND % OF WORK OF EACH SUBCONTRACTOR

Licensed Subcontractor's Name and Business Address	License #	Specific Description of Subcontract	Percentage of Work to be Performed

### NON-COLLUSION DECLARATION

#### TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

The undersigned declares:

I am the \_\_\_\_\_ of \_\_\_\_\_, the party making the foregoing bid. The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or to refrain from bidding. The bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or of any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder. All statements contained in the bid are true. The bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, to effectuate a collusive or sham bid, and has not paid, and will not pay, any person or entity for such purpose.

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on \_\_\_\_\_[date], at \_\_\_\_\_[city], \_\_\_\_\_[state].

Signed, \_\_\_\_\_

**GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT AGREEMENT**

**(SAMPLE CONTRACT ONLY: CONTRACT TERMS TO BE AMENDED/CONFORMED WITH  
BID PACKET REQUIREMENTS)**

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**AGREEMENT BETWEEN  
GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT  
AND \_\_\_\_\_  
FOR THE PROVISION OF \_\_\_\_\_ SERVICES**

**INTRODUCTION**

WHEREAS, the Great Basin Unified Air Pollution Control District (hereinafter referred to as "District") has the need for the \_\_\_\_\_ services of \_\_\_\_\_ of \_\_\_\_\_ (hereinafter referred to as "Contractor"), and in consideration of the mutual promises, covenants, terms, and conditions hereinafter contained, the parties hereby agree as follows:

**TERMS AND CONDITIONS**

**1. SCOPE OF WORK.**

The Contractor shall furnish to the District, upon its request, those services and work set forth in Attachment A, attached hereto and by reference incorporated herein. Requests by the District to the Contractor to perform under this Agreement will be made by \_\_\_\_\_, whose title is: \_\_\_\_\_ . Requests to the Contractor for work or services to be performed under this Agreement will be based upon the District's need for such services. The District makes no guarantee or warranty, of any nature, that any minimum level or amount of services or work will be requested of the Contractor by the District under this Agreement. District by this Agreement incurs no obligation or requirement to request from Contractor the performance of any services or work at all, even if District should have some need for such services or work during the term of this Agreement.

Services and work provided by the Contractor at the District's request under this Agreement will be performed in a manner consistent with the requirements and standards established by applicable federal, state, and County laws, ordinances, regulations, and resolutions. Such laws, ordinances, regulations, and resolutions include, but are not limited to, those which are referred to in this Agreement.

**2. TERM.**

The term of this Agreement shall be from \_\_\_\_\_, \_\_\_\_\_ to \_\_\_\_\_, \_\_\_\_\_ unless sooner terminated as provided below.

**3. CONSIDERATION.**

A. Compensation. District shall pay Contractor in accordance with the Schedule of Fees (set forth as Attachment B) for the services and work described in Attachment A which are performed by Contractor at the District's request.

B. Travel and per diem. Contractor will not be paid or reimbursed for travel expenses or per diem which Contractor incurs in providing services and work requested by District under this Agreement.

C. No additional consideration. Except as expressly provided in this Agreement, Contractor shall not be entitled to, nor receive, from District, any additional consideration, compensation, salary, wages, or other type of remuneration for services rendered under this Agreement. Specifically, Contractor shall not be entitled, by virtue of this Agreement, to consideration in the form of overtime, health insurance benefits, retirement benefits, disability retirement benefits, sick leave, vacation time, paid holidays, or other paid leaves of absence of any type or kind whatsoever.

D. Limit upon amount payable under Agreement. The total sum of all payments made by the District to Contractor for services and work performed under this Agreement shall not exceed \_\_\_\_\_ Dollars (hereinafter referred to as "contract limit"). District expressly reserves the right to deny any payment or reimbursement requested by Contractor for services or work performed which is in excess of the contract limit.

E. Billing and payment. Contractor shall submit to the District, once a month, an itemized statement of all services and work described in attachment A, which were done at the District's request. This statement will be submitted to the District not later than the fifth (5th) day of the month. The statement to be submitted will cover the period from the first (1st) day of the preceding month through and including the last day of the preceding month. This statement will identify the date on which the services and work were performed and describe the nature of the services and work which were performed on each day. Upon timely receipt of the statement by the fifth (5th) day of the month, District shall make payment to Contractor on the last day of the month.

F. Federal and State taxes.

- (1) Except as provided in subparagraph (2) below, District will not withhold any federal or state income taxes or social security from any payments made by District to Contractor under the terms and conditions of this Agreement.
- (2) District will withhold California State income taxes from payments made under this Agreement to non-California resident independent contractors when it is anticipated that total annual payments to Contractor under this Agreement will exceed one thousand four hundred ninety nine dollars (\$1,499.00).
- (3) Except as set forth above, District has no obligation to withhold any taxes or payments from sums paid by District to Contractor under this Agreement. Payment of all taxes and other assessments on such sums is the sole responsibility of Contractor. District has no responsibility or liability for payment of Contractor's taxes or assessments.
- (4) The total amounts paid by District to Contractor, and taxes withheld from payments to non-California residents, if any, will be reported annually to the Internal Revenue Service and the California State Franchise Tax Board. To facilitate this reporting, Contractor shall complete and submit to the County an Internal Revenue Service (IRS) Form W-9, attached hereto as Attachment C, upon executing this Agreement

**4. WORK SCHEDULE.**

Contractor's obligation is to perform, in a timely manner, those services and work identified in Attachment A which are requested by the District. It is understood by Contractor that the performance of these services and work will require a varied schedule. Contractor will arrange his/her own schedule, but will coordinate with District to insure that all services and work requested by District under this Agreement will be performed within the time frame set forth by District.

**5. REQUIRED LICENSES, CERTIFICATES, AND PERMITS.**

Any licenses, certificates, or permits required by the federal, state, district, county, or municipal governments for contractor to provide the services and work described in attachment A must be procured by Contractor and be valid at the time Contractor enters into this Agreement. Further, during the term of this Agreement, Contractor must maintain such licenses, certificates, and permits in full force and effect. Licenses, certificates, and permits may include, but are not limited to, driver's licenses, professional licenses or certificates, and business licenses. Such licenses, certificates, and permits will be procured and maintained in force by Contractor at no expense to the District. Contractor will



provide District, upon execution of this Agreement, with evidence of current and valid licenses, certificates and permits which are required to perform the services identified in attachment A. Where there is a dispute between Contractor and District as to what licenses, certificates, and permits are required to perform the services identified in attachment A, District reserves the right to make such determinations for purposes of this Agreement.

## **6. OFFICE SPACE, SUPPLIES, EQUIPMENT, ETC.**

Contractor shall provide such office space, supplies, equipment, vehicles, reference materials, and telephone service as is necessary for Contractor to provide the services identified in Attachment A to this Agreement. District is not obligated to reimburse or pay Contractor, for any expense or cost incurred by Contractor in procuring or maintaining such items. Responsibility for the costs and expenses incurred by Contractor in providing and maintaining such items is the sole responsibility and obligation of Contractor.

## **7. DISTRICT PROPERTY.**

A. Personal Property of District. Any personal property such as, but not limited to, protective or safety devices, badges, identification cards, keys, etc. provided to Contractor by District pursuant to this Agreement are, and at the termination of this Agreement remain, the sole and exclusive property of District. Contractor will use reasonable care to protect, safeguard and maintain such items while they are in Contractor's possession. Contractor will be financially responsible for any loss or damage to such items, partial or total, which is the result of Contractor's negligence.

B. Products of Contractor's Work and Services. Any and all compositions, publications, plans, designs, specifications, blueprints, maps, formulas, processes, photographs, slides, video tapes, computer programs, computer disks, computer tapes, memory chips, soundtracks, audio recordings, films, audio-visual presentations, exhibits, reports, studies, works of art, inventions, patents, trademarks, copyrights, or intellectual properties of any kind which are created, produced, assembled, compiled by, or are the result, product, or manifestation of, Contractor's services or work under this Agreement are, and at the termination of this Agreement remain, the sole and exclusive property of the District. At the termination of the Agreement, Contractor will convey possession and title to all such properties to District.

## **8. WORKERS' COMPENSATION.**

Contractor shall provide Statutory California Worker's Compensation coverage and Employer's Liability coverage for not less than \$1,000,000 per occurrence for all employees engaged in services or operations under this Agreement. The District, its agents, officers and employees shall be named as additional insured or a waiver of subrogation shall be provided.

## **9. INSURANCE.**

Contractor shall procure and maintain for the duration of the contract insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder and the results of that work by the Contractor, his agents, representatives or employees.

A. Minimum Scope of Insurance. Coverage shall be at least as broad as:

1. Insurance Services Office Commercial General Liability coverage (occurrence Form CG 0001).
2. Insurance Services Office Form Number CA 0001 covering Automobile Liability, code 1 (any auto).
3. Workers' Compensation insurance as required by the State of California and Employer's Liability Insurance.

4. Errors and Omissions liability insurance appropriate to the Contractor's profession. Architects' and engineers' coverage is to be endorsed to include contractual liability.

B. Minimum Limits of Insurance. Contractor shall maintain limits no less than:

1. General Liability (including operations, products and completed operations as applicable): \$1,000,000 per occurrence for bodily injury, personal injury and property damage. If Commercial General Liability insurance or other form with a general aggregate limit is used, either the general aggregate limit shall apply separately to this project/location or the general aggregate limit shall be twice the required occurrence limit.
2. Automobile Liability: \$300,000 per accident for bodily injury and property damage.
3. Employer's Liability: \$1,000,000 per accident for bodily injury or disease.
4. Errors and Omissions Liability: \$1,000,000 per occurrence.

C. Deductibles and Self-insured Retentions. Any deductibles or self-insured retentions must be declared to and approved by the District. At the option of the District, either the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the District, its officers, officials, employees and volunteers; or the Contractor shall provide a financial guarantee satisfactory to the District guaranteeing payment of losses and related investigations, claims administration, and defense expenses.

D. Other Insurance Provisions. The commercial general liability and automobile liability policies are to contain, or be endorsed to contain, the following provisions:

1. The District, its officers, officials, employees and volunteers are to be covered as insureds as respects: liability arising out of work or operations performed by or on behalf of the Contractor or liability arising out of automobiles owned, leased, hired or borrowed by or on behalf of the Contractor.
2. For any claims related to this project, the Contractor's insurance coverage shall be primary insurance as respects the District, its officers, officials, employees, and volunteers. Any insurance or self-insurance maintained by the District, its officers, officials, employees, or volunteers shall be excess of the Contractor's insurance and shall not contribute with it.
3. Each insurance policy required by this clause shall be endorsed to state that coverage shall not be canceled by either party, except after thirty (30) days prior written notice by certified mail, return receipt requested, has been given to the District.
4. Coverage shall not extend to any indemnity coverage for the active negligence of the additional insured in any case where an agreement to indemnify the additional insured would be invalid under Subdivision (b) of Section 2782 of the Civil Code.

E. Acceptability of Insurers. Insurance is to be placed with insurers with a current A.M. Best's rating of no less than A:VII. The District at its option may waive this requirement.

F. Verification of Coverage. Contractor shall furnish the District with original certificates and amendatory endorsements effecting coverage required by this clause. The endorsements should be on forms provided by the District or on other than the District's forms, provided those endorsements or policies conform to the requirements. All certificates and endorsements are to be received and approved by the District before work commences. The District reserves the right to require complete, certified copies of all required insurance policies, including endorsements effecting the coverage required by the specifications at any time.

**10. STATUS OF CONTRACTOR.**

All acts of Contractor, its agents, officers, and employees, relating to the performance of this Agreement, shall be performed as independent contractors, and not as agents, officers, or employees of District. Contractor, by virtue of this Agreement, has no authority to bind or incur any obligation on behalf of District. Except as expressly provided in Attachment A, Contractor has no authority or responsibility to exercise any rights or power vested in the District. No agent, officer, or employee of the District is to be considered an employee of Contractor. It is understood by both Contractor and District that this Agreement shall not under any circumstances be construed or considered to create an employer-employee relationship or a joint venture. As an independent contractor:

A. Contractor shall determine the method, details, and means of performing the work and services to be provided by Contractor under this Agreement.

B. Contractor shall be responsible to District only for the requirements and results specified in this Agreement, and except as expressly provided in this Agreement, shall not be subjected to District's control with respect to the physical action or activities of Contractor in fulfillment of this Agreement.

C. Contractor, its agents, officers, and employees are, and at all times during the term of this Agreement shall, represent and conduct themselves as independent contractors, and not as employees of District.

**11. DEFENSE AND INDEMNIFICATION.**

Contractor shall defend, indemnify, and hold harmless District, its agents, officers, and employees from and against all claims, damages, losses, judgments, liabilities, expenses, and other costs, including litigation costs and attorney's fees, arising out of, resulting from, or in connection with, the performance of this Agreement by Contractor, or Contractor's agents, officers, or employees. Contractor's obligation to defend, indemnify, and hold the District, its agents, officers, and employees harmless applies to any actual or alleged personal injury, death, or damage or destruction to tangible or intangible property, including the loss of use. Contractor's obligation under this paragraph extends to any claim, damage, loss, liability, expense, or other costs which is caused in whole or in part by any act or omission of the Contractor, its agents, employees, supplier, or any one directly or indirectly employed by any of them, or anyone for whose acts or omissions any of them may be liable.

Contractor's obligation to defend, indemnify, and hold the District, its agents, officers, and employees harmless under the provisions of this paragraph is not limited to, or restricted by, any requirement in this Agreement for Contractor to procure and maintain a policy of insurance.

To the extent permitted by law, District shall defend, indemnify, and hold harmless Contractor, its agents, officers, and employees from and against all claims, damages, losses, judgments, liabilities, expenses, and other costs, including litigation costs and attorney's fees, arising out of, or resulting from, the active negligence, or wrongful acts of District, its officers, or employees.

**12. RECORDS AND AUDIT.**

A. Records. Contractor shall prepare and maintain all records required by the various provisions of this Agreement, federal, state, and municipal law, ordinances, regulations, and directions. Contractor shall maintain these records for a minimum of four (4) years from the termination or completion of this Agreement. Contractor may fulfill its obligation to maintain records as required by this paragraph by substitute photographs, microphotographs, or other authentic reproduction of such records.

B. Inspections and Audits. Any authorized representative of District shall have access to any books, documents, papers, records, including, but not limited to, financial records of Contractor, which District determines to be pertinent to this Agreement, for the purposes of making audit, evaluation, examination, excerpts, and transcripts during the period such records are to be maintained by Contractor. Further, District has the right, at all reasonable times, to audit, inspect, or otherwise evaluate the work performed or being performed under this Agreement.

**13. NONDISCRIMINATION.**

During the performance of this Agreement, Contractor, its agents, officers, and employees shall not unlawfully discriminate in violation of any federal, state, district or local law, against any employee, or applicant for employment, or person receiving services under this Agreement, because of race, religion, color, national origin, ancestry, physical handicap, medical condition, marital status, age, or sex. Contractor and its agents, officers, and employees shall comply with the provisions of the Fair Employment and Housing Act (Government Code section 12900, et seq.), and the applicable regulations promulgated thereunder in the California Code of Regulations. Contractor shall also abide by the Federal Civil Rights Act of 1964 (P.L. 88-352) and all amendments thereto, and all administrative rules and regulations issued pursuant to said act.

**14. CANCELLATION.**

This Agreement may be canceled by District without cause, and at will, for any reason by giving to Contractor thirty (30) days written notice of such intent to cancel. Contractor may cancel this Agreement without cause, and at will, for any reason whatsoever by giving thirty (30) days written notice of such intent to cancel to District.

**15. ASSIGNMENT.**

This is an agreement for the services of Contractor. District has relied upon the skills, knowledge, experience, and training of Contractor as an inducement to enter into this Agreement. Contractor shall not assign or subcontract this Agreement, or any part of it, without the express written consent of District. Further, Contractor shall not assign any monies due or to become due under this Agreement without the prior written consent of District.

**16. DEFAULT.**

If the Contractor abandons the work, or fails to proceed with the work and services requested by District in a timely manner, or fails in any way as required to conduct the work and services as required by District, District may declare the Contractor in default and terminate this Agreement upon five (5) days written notice to Contractor. Upon such termination by default, District will pay to Contractor all amounts owing to Contractor for services and work satisfactorily performed to the date of termination.

**17. WAIVER OF DEFAULT.**

Waiver of any default by either party to this Agreement shall not be deemed to be waiver of any subsequent default. Waiver or breach of any provision of this Agreement shall not be deemed to be a waiver of any other or subsequent breach, and shall not be construed to be a modification of the terms of this Agreement unless this Agreement is modified as provided in paragraph twenty-four (24) below.

**18. CONFIDENTIALITY.**

Contractor agrees to comply with the various provisions of the federal, state, and county laws, regulations, and ordinances providing that information and records kept, maintained, or accessible by Contractor in the course of providing services and work under this Agreement, shall be privileged, restricted, or confidential. Contractor agrees to keep confidential all such information and records. Disclosure of such confidential, privileged, or protected information shall be made by Contractor only with the express written consent of the District.

**19. CONFLICTS.**

Contractor agrees that it has no interest, and shall not acquire any interest, direct or indirect, which would conflict in any manner or degree with the performance of the work and services under this Agreement.

**20. POST AGREEMENT COVENANT.**

Contractor agrees not to use any confidential, protected, or privileged information which is gained from the District in the course of providing services and work under this Agreement, for any personal benefit, gain, or enhancement. Further, Contractor agrees for a period of two years after the termination of this Agreement, not to seek or accept any employment with any entity, association, corporation, or person who, during the term of this Agreement, has had an adverse or conflicting interest with the District, or who has been an adverse party in litigation with the District, and concerning such, Contractor by virtue of this Agreement has gained access to the District's confidential, privileged, protected, or proprietary information.

**21. SEVERABILITY.**

If any portion of this Agreement or application thereof to any person or circumstance shall be declared invalid by a court of competent jurisdiction, or if it is found in contravention of any federal, state, district or county statute, ordinance, or regulation, the remaining provisions of this Agreement, or the application thereof, shall not be invalidated thereby, and shall remain in full force and effect to the extent that the provisions of this Agreement are severable.

**22. FUNDING LIMITATION.**

The ability of District to enter this Agreement is based upon available funding from various sources. In the event that such funding fails, is reduced, or is modified, from one or more sources, District has the option to cancel, reduce, or modify this Agreement, or any of its terms within ten (10) days of its notifying Contractor of the cancellation, reduction, or modification of available funding. Any reduction or modification of this Agreement made pursuant to this provision must comply with the requirements of paragraph twenty-four (24) (Amendment).

**23. ATTORNEY'S FEES.**

If either of the parties hereto brings an action or proceeding against the other, including, but not limited to, an action to enforce or declare the cancellation, termination, or revision of the Agreement, the prevailing party in such action or proceeding shall be entitled to receive from the other party all reasonable attorney's fees and costs incurred in connection therewith.

**24. AMENDMENT.**

This Agreement may be modified, amended, changed, added to, or subtracted from, by the mutual consent of the parties hereto, if such amendment or change is in written form and executed with the same formalities as this Agreement, and attached to the original Agreement to maintain continuity.

**25. NOTICE.**

Any notice, communication, amendments, additions, or deletions to this Agreement, including change of address of either party during the terms of this Agreement, which Contractor or District shall be required, or may desire, to make, shall be in writing and may be personally served, or sent by prepaid first class mail to, the respective parties as follows:

**Great Basin Unified Air Pollution Control District  
157 Short Street, Suite 6  
Bishop, California 93514**

**Contractor:**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_ Name  
Street  
City and State

**26. ENTIRE AGREEMENT.**

This Agreement contains the entire agreement of the parties, and no representations, inducements, promises, or agreements otherwise between the parties not embodied herein or incorporated herein by reference, shall be of any force or effect. Further, no term or provision hereof may be changed, waived, discharged, or terminated, unless the same be in writing executed by the parties hereto.

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**AGREEMENT BETWEEN  
GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT  
AND \_\_\_\_\_  
FOR THE PROVISION OF \_\_\_\_\_ SERVICES**

IN WITNESS THEREOF, THE PARTIES HERETO HAVE SET THEIR HANDS AND SEALS THIS  
\_\_\_\_ DAY OF \_\_\_\_\_, \_\_\_\_\_.

**DISTRICT**

By: \_\_\_\_\_

Dated: \_\_\_\_\_

**CONTRACTOR**

By: \_\_\_\_\_  
Print or Type Name

\_\_\_\_\_  
Signature

Dated: \_\_\_\_\_

**ATTACHMENT A**

**AGREEMENT BETWEEN  
GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT  
AND \_\_\_\_\_  
FOR THE PROVISION OF \_\_\_\_\_ SERVICES**

**TERM:**

**FROM: \_\_\_\_\_ TO: \_\_\_\_\_**

**SCOPE OF WORK:**



**ATTACHMENT B**

**AGREEMENT BETWEEN  
GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT  
AND \_\_\_\_\_  
FOR THE PROVISION OF \_\_\_\_\_ SERVICES**

**TERM:**

**FROM: \_\_\_\_\_ TO: \_\_\_\_\_**

**SCHEDULE OF FEES:**

**ATTACHMENT C**

**AGREEMENT BETWEEN  
GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT  
AND \_\_\_\_\_  
FOR THE PROVISION OF \_\_\_\_\_ SERVICES**

**TERM:**

**FROM: \_\_\_\_\_ TO: \_\_\_\_\_**

**FORM W-9**

**Request for Taxpayer  
Identification Number and Certification  
(See attached)**

## **STANDARD CONDITIONS**

### **SC.01) Acknowledgement of Credit**

Contractor shall install a sign at a prominent location which shall include a statement that the project is being conducted by the Great Basin Unified Air Pollution Control District through funds received from the Los Angeles Department of Water and Power as part of a Settlement Agreement in 2013.

### **SC.02) Air or Water Pollution Violation**

Under State laws, the Contractor shall not be: (1) in violation of any order or resolution not subject to review promulgated by the State Air Resources Board or an air pollution control district; (2) subject to cease and desist order not subject to review issued pursuant to Section 13301 of the Water Code for violation of waste discharge requirements or discharge prohibitions; or (3) finally determined to be in violation of provisions of federal law relating to air or water pollution.

### **SC.03) Americans With Disabilities Act**

By signing this Agreement, Contractor assures the District and the State that it complies with the Americans with Disabilities Act (ADA) of 1990, (42 U.S.C., 12101 et seq.), which prohibits discrimination on the basis of disability, as well as all applicable regulations and guidelines issued pursuant to the ADA.

### **SC.04) Approval**

This Agreement is of no force or effect until signed by all parties to the agreement. Contractor may not submit invoices or receive payment until all required signatures have been obtained.

### **SC.05) Audits**

The District reserves the right to conduct an audit at any time between the execution of this Agreement and the completion of the Project, with the costs of such audit borne by State. After completion of the Project, the District may require Contractor to conduct a final audit to State's specifications, at Contractor's expense, such audit to be conducted by and a report prepared by an independent Certified Public Accountant.

### **SC.06) CEQA and Permitting**

Activities funded under this Agreement, regardless of funding source, must be in compliance with the California Environmental Quality Act (CEQA) (PRC §21000 et seq.). In addition, all construction activities shall be in compliance with all permits associated with the project.

### **SC.07) Child Support Compliance Act**

For any Agreement in excess of \$100,000, the Contractor acknowledges in accordance with Public Contract Code 7110, that:

- A. The Contractor recognizes the importance of child and family support obligations and shall fully comply with all applicable state and federal laws relating to child and family support enforcement, including, but not limited to, disclosure of information and compliance with earnings assignment orders, as provided in Chapter 8 (commencing with section 5200) of Part 5 of Division 9 of the Family Code; and

- B. The Contractor, to the best of its knowledge is fully complying with the earnings assignment orders of all employees and is providing the names of all new employees to the New Hire Registry maintained by the California Employment Development Department.

### **SC.08) Claims Dispute**

Any claim that the Contractor may have regarding performance of this agreement including, but not limited to, claims for additional compensation or extension of time, shall be submitted to the DWR Project Representative, within thirty (30) days of the Contractor's knowledge of the claim. State and Contractor shall then attempt to negotiate a resolution of such claim and process an amendment to this Agreement to implement the terms of any such resolution.

### **SC.09) Competitive Bidding and Procurements**

Contractor shall comply with all applicable laws and regulations regarding securing competitive bids and undertaking competitive negotiations in Contractor's contracts with other entities for acquisition of goods and services and construction of public works with funds provided by State under this Agreement.

### **SC.10) Delivery of Information, Reports, and Data**

Contractor agrees to expeditiously provide throughout the term of this Agreement, such reports, data, information, and certifications as may be reasonably required by State.

### **SC.11) Disposition of Equipment**

Contractor shall provide to the District, not less than 30 calendar days prior to submission of the final invoice, an itemized inventory of equipment purchased with funds provided by the District. The inventory shall include all items with a current estimated fair market value of more than \$5,000.00 per item. Within 60 calendar days of receipt of such inventory the District shall provide Contractor with a list of the items on the inventory that District will take title to.

### **SC.12) Drug-Free Workplace Certification**

Certification of Compliance: By signing this Agreement, Contractor, its contractors or subcontractors hereby certify, under penalty of perjury under the laws of State of California, compliance with the requirements of the Drug-Free Workplace Act of 1990 (Government Code 8350 et seq.) and have or will provide a drug-free workplace by taking the following actions:

- A. Publish a statement notifying employees, contractors, and subcontractors that unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance is prohibited and specifying actions to be taken against employees, contractors, or subcontractors for violations, as required by Government Code Section 8355(a)(1).
- B. Establish a Drug-Free Awareness Program, as required by Government Code Section 8355(a)(2) to inform employees, contractors, or subcontractors about all of the following:
  - i. The dangers of drug abuse in the workplace,
  - ii. Contractor's policy of maintaining a drug-free workplace,
  - iii. Any available counseling, rehabilitation, and employee assistance programs, and

- iv. Penalties that may be imposed upon employees, contractors, and subcontractors for drug abuse violations.
- C. Provide as required by Government Code Sections 8355(a)(3), that every employee, contractor, and/or subcontractor who works under this Agreement:
- i. Will receive a copy of Contractor's drug-free policy statement, and
  - ii. Will agree to abide by terms of Contractor's condition of employment, contract or subcontract.

### **SC.13) Final Inspections and Certification of District Representative**

Upon completion of the Project, Contractor shall provide for a final inspection and certification by the District's Representative that the Project has been completed in accordance with submitted final plans and specifications and any modifications thereto and in accordance with this Agreement.

### **SC.14) Contractor Commitments**

Contractor accepts and agrees to comply with all terms, provisions, conditions and commitments of this Agreement, including all incorporated documents, and to fulfill all assurances, declarations, representations, and statements made by the Contractor in the application, documents, amendments, and communications filed in support of its request for funding.

### **SC.15) Inspection of Books, Records, and Reports**

During regular office hours, each of the parties hereto and their duly authorized representatives shall have the right to inspect and to make copies of any books, records, or reports of either party pertaining to this Agreement or matters related hereto. Each of the parties hereto shall maintain and shall make available at all times for such inspection accurate records of all its costs, disbursements, and receipts with respect to its activities under this Agreement. Failure or refusal by Contractor to comply with this provision shall be considered a breach of this Agreement, and State may withhold disbursements to Contractor or take any other action it deems necessary to protect its interests.

### **SC.16) Inspections of Project by District**

District shall have the right to inspect the work being performed at any and all reasonable times during the term of the Agreement. This right shall extend to any subcontracts, and Contractor shall include provisions ensuring such access in all its contracts or subcontracts entered into pursuant to its Agreement with District.

### **SC.17) Labor Code Compliance**

The Contractor will be required to keep informed of and take all measures necessary to ensure compliance with applicable California Labor Code requirements, including, but not limited to, Section 1720 et seq. of the California Labor Code regarding public works, limitations on use of volunteer labor (California Labor Code Section 1720.4), labor compliance programs (California Labor Code Section 1771.5) and payment of prevailing wages for work done and funded pursuant to these Guidelines, including any payments to the Department of Industrial Relations under Labor Code Section 1771.3.

### **SC.18) Modification of Overall Work Plan**

At the request of the Contractor, the District may at its sole discretion approve non-material changes to the portions of Exhibit A which concern the budget and schedule without formally amending this Agreement. Non-material changes with respect to the budget are changes that only result in reallocation of the budget and will not result in an increase in the amount of the District Agreement. Non-material changes with respect to the Project schedule are changes that will not extend the term of this Agreement. Requests for non-material changes to the budget and schedule must be submitted by the Contractor to the District in writing and are not effective unless and until specifically approved by the District in writing.

### **SC.19) Nondiscrimination**

During the performance of this Agreement, Contractor and its contractors or subcontractors shall not unlawfully discriminate, harass, or allow harassment against any employee or applicant for employment because of sex, race, color, ancestry, religious creed, national origin, physical disability (including HIV and AIDS), mental disability, medical condition (cancer), age (over 40), marital status, and denial of family care leave. Contractor and its contractors or subcontractors shall ensure that the evaluation and treatment of their employees and applicants for employment are free from such discrimination and harassment. Contractor and its contractors or subcontractors shall comply with the provisions of the Fair Employment and Housing Act (Gov. Code §12990 (a-f) et seq.) and the applicable regulations promulgated there under (California Code of Regulations, Title 2, Section 7285 et seq.). The applicable regulations of the Fair Employment and Housing Commission implementing Government Code Section 12990 (a-f), set forth in Chapter 5 of Division 4 of Title 2 of the California Code of Regulations, are incorporated into this Agreement by reference and made a part hereof as if set forth in full. Contractor and its contractors or subcontractors shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other agreement.

Contractor shall include the nondiscrimination and compliance provisions of this clause in all subcontracts to perform work under the Agreement.

### **SC.20) No Discrimination Against Domestic Partners**

For contracts over \$100,000 executed or amended after January 1, 2007, the Contractor certifies by signing this Agreement, under penalty of perjury under the laws of State of California that Contractor is in compliance with Public Contract Code section 10295.3.

### **SC.21) Performance and Assurances**

Contractor agrees to faithfully and expeditiously perform or cause to be performed all Project work as described in the Scope of Work and to apply District funds received only to Eligible Project Costs in accordance with applicable provisions of the law.

### **SC.22) Priority Hiring Considerations**

If this Agreement includes services in excess of \$200,000, the Contractor shall give priority consideration in filling vacancies in positions funded by the Agreement to qualified recipients of aid under Welfare and Institutions Code Section 11200 in accordance with Pub. Contract Code §10353. Priority in hiring shall also be given to qualified local residents and to qualified Tribal members.

### **SC.23) Remedies Not Exclusive**

The use by either party of any remedy specified herein for the enforcement of this Agreement is not exclusive and shall not deprive the party using such remedy of, or limit the application of, any other remedy provided by law.

### **SC.24) Rights In Data**

Contractor agrees that all data, plans, drawings, specifications, reports, computer programs, operating manuals, notes and other written or graphic work produced in the performance of this Agreement shall be made available to the District and shall be in the public domain to the extent to which release of such materials is required under the California Public Records Act., Cal. Gov't Code §§ 6250 et seq. Contractor may disclose, disseminate and use in whole or in part, any final form data and information received, collected and developed under this Agreement, subject to appropriate acknowledgement. Contractor shall not utilize the materials for any profit-making venture or sell or grant rights to a third party who intends to do so. The District shall have the right to use any data described in this paragraph for any public purpose.

### **SC.25) Severability**

Should any portion of this Agreement be determined to be void or unenforceable, such shall be severed from the whole and the Agreement shall continue as modified.

### **SC.26) Suspension of Payments**

This Agreement may be subject to suspension of payments or termination, or both, and Contractor may be subject to debarment if the District determines that:

- a. Contractor, or its subcontractors have made a false certification, or
- b. Contractor, or its subcontractors violates the certification by failing to carry out the requirements noted above.

### **SC.27) Termination by Contractor**

Subject to District approval which may be reasonably withheld, Contractor may terminate this Agreement and be relieved of contractual obligations. In doing so, Contractor must provide a reason(s) for termination. Contractor must submit all progress reports summarizing accomplishments up until termination date.

### **SC.28) Termination For Cause**

Subject to the right to cure, the District may terminate this Agreement and be relieved of any payments should Contractor fail to perform the requirements of this Agreement at the time and in the manner herein provided included but not limited to reason of default.

### **SC.29) Termination Without Cause**

The District may terminate this Agreement without cause on 30 days advance written notice. The Contractor shall be reimbursed for all reasonable expenses incurred up to the date of termination.

### **SC.30) Third Party Beneficiaries**

The parties to this Agreement do not intend to create rights in, or grant remedies to, any third party as a beneficiary of this Agreement, or any duty, covenant, obligation or understanding established herein.

### **SC.31) Timeliness**

Time is of the essence in this Agreement. Work must be completed by December 31, 2017.

### **SC.32) Withholding/Retention**

The District, at its discretion, may withhold ten percent (10%) of the funds requested by the Contractor for reimbursement of Eligible Project Costs until the Project is completed and Final Report is received. Withheld funds may be released upon completion of milestones identified in the Scope of Work.

Contractor shall be compensated in proportion to the work completed during a billing period. Contractor shall submit to District a periodic itemized statement which indicates work completed by task and other reports as required by the Agreement. The statement shall describe the amount of Services and supplies provided since the initial commencement date, or since the start of the subsequent billing periods, as appropriate, through the date of the statement.

Payments prior to satisfactory completion of all work required of this Agreement, shall not exceed, in the aggregate, ninety percent (90%) of the total earned to date. All retention shall be paid upon satisfactory completion of the Project, as otherwise provided herein.

### **SC.33) Workers' Compensation**

Contractor affirms that it is aware of the provisions of Section 3700 of the California Labor Code, which requires every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and Contractor affirms that it will comply with such provisions before commencing the performance of the work under this Agreement and will make its contractors and subcontractors aware of this provision.



## INSURANCE & BONDS

### **I-01. Contract Security**

The Contractor shall furnish a performance bond in an amount at least equal to one hundred percent (100%) of the contract price as security for the faithful performance of this contract. A payment bond shall be furnished in an amount not less than one hundred percent (100%) of the contract price as security for the payment of all persons performing labor and/or furnishing materials or other supplies under this contract. **All bonds shall be executed by admitted surety insurers, as defined in Code of Civil Procedure section 995.120.**

**Pursuant to Section 995.660(a) of the Code of Civil Procedure, the Contractor shall submit the following documents with the performance and payment bonds:**

- a. The original, or a certified copy of the unrevoked appointment, power of attorney, bylaws, or other instrument entitling or authorizing the person who executed the bond to do so;
- b. A certified copy of the certificate of authority of the insurer issued by the State of California's Insurance Commissioner; and
- c. Copies of the insurer's most recent annual and quarterly statements filed with the Department of Insurance.

The Contractor shall take out and maintain performance and payment bonds at his sole cost and expense at all times during the life of this contract, including the entire time of the Contractor's guarantee, with surety carriers admitted to transact business in the State of California.

The following provision shall be added to and made a part of the bond agreement:

*"Surety agrees to the acceptance of arbitration as to any controversy or claim affecting its obligation where agreed to by the contracting parties pursuant to Arbitration of the Contract Conditions."*

### **I-02. Contractor's And Subcontractor's Insurance**

The Contractor shall not commence work under this Contract until he has obtained and submitted all policies of insurance (including all endorsements) acceptable to the District, nor shall he allow any subcontractor to commence work until all policies of insurance of the subcontractor have been obtained (by the Contractor), as required hereunder.

The Contractor and his subcontractors shall take out and maintain insurance, with coverages acceptable to the District, at his sole cost and expense at all times during the life of this Contract, including the entire time of the Contractor's guarantee.

Each such policy of insurance shall:

- a. Be issued by insurance carriers that are:
  1. Rated no less than A-, Class VIII or better by the A. M. Best Company

2. Licensed to transact insurance business in the State of California
3. Captive and Risk Retention groups are not acceptable unless rated no less than A-, VIII or better by the A. M. Best Company
4. Self-Insured Retention (SIR) greater than \$10,000 is not acceptable on any policy.

Any insurance carrier, which is strategically affiliated with a parent insurance company or insurance group, must disclose the name of the parent company or group in any certificate of insurance documentation provided to the District.

Non-admitted/Surplus Lines insurance carriers (carriers not licensed in the State of California) may be acceptable to the District under certain conditions. The District reserves the right to disqualify a non-admitted insurer without cause.

Non-admitted insurance carriers providing any form of insurance coverage must be:

1. Domiciled in the United States
  2. Listed as an approved insurance carrier on the California Department of Insurance L.E.S.L.I. list
  3. Rated no less than "A-, Class VIII" or better by the A.M. Best Company
  4. Captive and Risk Retention groups are not acceptable unless rated no less than A, VIII or better by the A. M. Best Company
- b. Name and list the District, Agent(s), and other personals and entities as required and specified in the Standard Conditions, and/or all permittors, as additional insured, to include completed-operations up to 5 years beyond the completion date.
  - c. The insurance contract should state that it is intended for the transferee's policy to apply on a primary basis, as would standard ISO form CG 00 01 10 01, on behalf of the additional insured and that it will be modified, if necessary, to provide coverage in this manner.
  - d. Require all deductibles be the sole responsibility of the Contractor, including the deductible for any builders risk insurance policy procured by the District.
  - e. Not be canceled, reduced in coverage or limits until thirty (30) days after receipt by the District of a written notice of such cancellation including a ten (10) day notice for non-payment of premium, as evidenced by receipt of a registered letter.
  - f. Otherwise be in form satisfactory to District.
  - g. Any and all losses connected with the insurance policies in force for the District shall require cooperation of the Contractor in determining the cause of loss, the repair process, and the securing of information to determine settlement of said claim. Failure to comply with the adjuster's request or insurance carriers requests to settlement in a timely manner, will result in breach of contract.

The Contractor and his subcontractors shall take out and maintain the following policies of "occurrence form"-type insurance with coverages acceptable to the District:

- h. Workers' Compensation Insurance. In accordance with the provisions of Section 3700 of the Labor Code of the State of California, Contractor shall secure the payment of compensation to his employees; and the Contractor shall require all subcontractors similarly to provide such compensation insurance for all of the latter's employees. Such policy shall contain an endorsement which waives all right of subrogation against those persons and entities designated in the policy.
- i. Commercial Liability Insurance. The Contractor shall procure and maintain Commercial Liability Insurance in amounts not less than the following amounts unless otherwise specified in the Special Conditions:
- \$2,000,000 per each occurrence
  - \$5,000,000 General Aggregate Limit
  - \$5,000,000 Products-Completed Operations Aggregate Limit
  - \$2,000,000 Personal & Advertising injury limit

**THE POLICY IS TO BE ENDORSED FOR THE AGGREGATE LIMIT TO APPLY TO THIS PROJECT** by utilizing endorsement form "CG 25 03 03 97" (or similar), executed by the insurance carrier.

Where excess liability insurance is used in connection with primary liability insurance, the combination of such must allow total limits of liability to be in amounts not less than the above-specified amount.

- j. Automobile Liability Insurance. The Contractor shall procure and maintain Automobile Liability insurance in amount not less than the following amount unless otherwise specified in the Special Conditions:
- \$2,000,000 combined single limit

### **I-03. ADDITIONAL SURETY**

If during the continuance of the contract any of the sureties upon the faithful performance bond is no longer sufficient under Code of Civil Procedure section 995.660(b), District may require additional sureties which the Contractor shall furnish to the satisfaction of the District within fifteen (15) days after notice, and in default thereof the contract may be suspended and the work completed as provided in section titled Right of the District to Terminate Contract.

## WORKERS' COMPENSATION INSURANCE CERTIFICATE

The Contractor shall execute the following form as required by the California Labor Code, Sections 1860 and 1861:

I am aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this contract.

Date \_\_\_\_\_

\_\_\_\_\_  
(Contractor)

**By:** \_\_\_\_\_

(Signature)

\_\_\_\_\_  
(Title)



# CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)  
Month/Date/Year

<b>PRODUCER</b>  Insurence Agent/Broker Name Insurence Agent/Broker Street Address or P.O. Box Insurence Agent/Broker City, State & Zip Code Contact & Phone Number	THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.																		
<b>INSURED</b>  Contractor's Name Street Address or P.O. Box City, State & Zip Code	<table border="1" style="width: 100%;"> <tr> <th colspan="2">INSURERS AFFORDING COVERAGE</th> <th>NAIC #</th> </tr> <tr> <td>INSURER A:</td> <td>Name of Insurance Company</td> <td>Enter NAIC#</td> </tr> <tr> <td>INSURER B:</td> <td colspan="2">All Carriers must be rated A- VIII or better</td> </tr> <tr> <td>INSURER C:</td> <td colspan="2">in current AM Best Rating Guide</td> </tr> <tr> <td>INSURER D:</td> <td colspan="2"></td> </tr> <tr> <td>INSURER E:</td> <td colspan="2"></td> </tr> </table>	INSURERS AFFORDING COVERAGE		NAIC #	INSURER A:	Name of Insurance Company	Enter NAIC#	INSURER B:	All Carriers must be rated A- VIII or better		INSURER C:	in current AM Best Rating Guide		INSURER D:			INSURER E:		
INSURERS AFFORDING COVERAGE		NAIC #																	
INSURER A:	Name of Insurance Company	Enter NAIC#																	
INSURER B:	All Carriers must be rated A- VIII or better																		
INSURER C:	in current AM Best Rating Guide																		
INSURER D:																			
INSURER E:																			

**COVERAGES:**

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. AGGREGATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	ADD'L INSRD	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS	
A	<input checked="" type="checkbox"/>	GENERAL LIABILITY <input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS MADE <input checked="" type="checkbox"/> OCCUR <input type="checkbox"/> <input type="checkbox"/> GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PROJECT <input type="checkbox"/> LOC	See NOTE #1 & #2 Enter Policy #	Enter Effective Date	Enter Expiration Date	EACH OCCURENCE	\$ 2,000,000
						DAMAGE TO RENTED PREMISES (Ea occurrence)	\$ 50,000
						MED EXP (Any one person)	\$ 5,000
						PERSONAL & ADV INJURY	\$ 2,000,000
						GENERAL AGGREGATE	\$ 5,000,000
						PRODUCTS - COMP/OP AGG	\$ 5,000,000
B	<input checked="" type="checkbox"/>	AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> HIRED AUTOS <input type="checkbox"/> NON-OWNED AUTOS <input type="checkbox"/>	Enter Policy #	Enter Effective Date	Enter Expiration Date	COMBINED SINGLE LIMIT (Each Occurrence)	\$ 2,000,000
						BODILY INJURY (Per person)	
						BODILY INJURY (Per accident)	
						PROPERTY DAMAGE (Per accident)	
A	<input checked="" type="checkbox"/>	Professional Liability Insurance				Workers' Compensation General Liability \$ 1,000,000 Professional Liability \$ 1,000,000 Automobile Liability \$ 1,000,000	Statutory \$ 1,000,000 \$ 1,000,000 \$ 1,000,000
A	<input checked="" type="checkbox"/>	EXCESS/UMBRELLA LIABILITY <input checked="" type="checkbox"/> OCCUR <input type="checkbox"/> CLAIMS MADE <input type="checkbox"/> DEDUCTIBLE <input type="checkbox"/> RETENTION	See NOTE #4 Enter Policy # (if required)	Enter Effective Date	Enter Expiration Date	EACH OCCURENCE	\$Enter Limit
						AGGREGATE	\$Enter Limit
C	<input checked="" type="checkbox"/>	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? If yes, describe under SPECIAL PROVISIONS below	See NOTE #3 Enter Policy #	Enter Effective Date	Enter Expiration Date	<input checked="" type="checkbox"/> WC STATUTORY LIMITS <input type="checkbox"/> OTHER	
						E.L. EACH ACCIDENT	\$ 1,000,000
						E.L. DISEASE - EA EMPLOYEE	\$ 1,000,000
						E.L. DISEASE - POLICY LIMIT	\$ 1,000,000
D	<input checked="" type="checkbox"/>	Builder's Risk with Flood Equipment Floater	Deductibles: BR \$1,000 Enter Policy #	Flood: \$100,000		BR & Flood = Equipment Floater =	Contract Value Scheduled Equipment

**DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES / EXCLUSIONS ADDED BY ENDORSEMENT / SPECIAL PROVISIONS**

Include Project Name & Spec Number here.  
 NOTE #1: EMWD & others (See Section H & Special Conditions) named as additional insured per CG2010 (11/85) OR CG2010 (10/01) WITH CG2037 (10/01).  
 NOTE #2: Per Project Aggregate limits per CG2503 (3/97).  
 NOTE #3: Waiver of Subrogation endorsement to Worker's Compensation in favor of EMWD. Endorsements must be attached.  
 NOTE #4: Excess/Umbrella liability can be used in connection with primary liability insurance to equal amounts required.

**CERTIFICATE HOLDER**

**EASTERN MUNICIPAL WATER DISTRICT**  
 Attn: Field Engineering Department  
 P O Box 8300  
 Perris, CA 92572-8300

**CANCELLATION**

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE INSURER AFFORDING COVERAGE WILL ENDEAVOR TO MAIL 30 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO DO SO SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE INSURER, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE

**IMPORTANT**

If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

**DISCLAIMER**

The Certificate of Insurance on the reverse side of this form does not constitute a contract between the issuing insurer(s), authorized representative or producer, and the certificate holder, nor does it affirmatively or negatively amend, extend or alter the coverage afforded by the policies listed thereon.

ACORD 25 (2001/08)

Bond No. _____
----------------

**PERFORMANCE BOND**

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

KNOW ALL BY THESE PRESENT: that *(Here insert full name and address of CONTRACTOR)*

as Principal, hereinafter called Principal; and *(Here insert full name and address of SURETY)*

as Surety, hereinafter Surety, are held and firmly bound unto *(Full name and address of OWNER)*

Great Basin Unified Air Pollution Control District  
157 Short Street  
Bishop, CA 93514

as Obligee, hereinafter called Owner, for the use and benefit of claimants as herein below defined, in the amount of:

**Amount:        \$**

for the payment whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal has by written agreement entered into a contract with Owner in accordance with the Drawings, Specifications and Addenda for:

**CONSTRUCTION CONTRACT**

Date:

Project: (Spec#, Name & Location)

which contract is by reference made a part hereof, and is hereinafter referred to as the Construction Contract.

1 The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

2 If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except to participate in conferences as provided in Subparagraph 3.1.

3 The Surety's obligation under this Bond shall arise after:

3.1 The Owner has notified the Contractor and the Surety at its address described in Paragraph 10 below of the Owner's intention to terminate the Construction Contract and has requested and attempted to arrange a conference with the Contractor and the Surety to be held not later than ten days after service of such notice to discuss methods of performing the Construction Contract. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default; and

3.2 The Owner has declared a Contractor Default and formally terminated the Contractor's right to complete the contract. Such Contractor Default shall not be declared earlier than ten days after the Contractor and the Surety have been served notice as provided in Subparagraph 3.1; and

3.3 The Owner has agreed to pay the Balance of the Contract Price to the Surety in accordance with the terms of the Construction Contract or to a contractor selected to perform the Construction Contract in accordance with the terms of the contract with the Owner.

4 When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

4.1 Arrange for the Contractor, with consent of the Owner in the Owner's sole discretion, to perform and complete the Construction Contract; or

4.2 Undertake to perform and complete the Construction Contract itself, through its agents or through independent contractors; or

4.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and the contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 6 in excess of the Balance of the Contract Price incurred by the Owner resulting from the Contractor's default; or

4.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, tender payment therefor to the Owner; or

.2 Deny liability in whole or in part and notify the Owner citing reasons therefor.

5 If the Surety does not proceed as provided in Paragraph 4 with reasonable promptness, the Surety shall be deemed to be in default on this Bond fifteen days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Subparagraph 4.4, and the Owner refuses the payment tendered or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

6 After the Owner has terminated the Contractor's right to complete the Construction Contract, and if the Surety elects to act under Subparagraph 4.1, 4.2, or 4.3 above, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. To the limit of the amount of this Bond, but subject to commitment by the Owner of the Balance of the Contract Price to mitigation of costs and damages on the Construction Contract, the Surety is obligated without duplication for:

6.1 The responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

6.2 Additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 4; and

6.3 Liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

7 The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators or successors.



8 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

9 Any proceeding, legal or equitable, under this Bond shall be instituted in the Superior Court of the County of Riverside, State of California. The parties expressly consent to the jurisdiction of said court and agree that said court shall be a proper venue for any such action. This Bond shall be governed by and interpreted in accordance with the laws of the State of California, excluding any choice of law provisions. EMWD 08/01/12 Page C9-3 00036 Performance Bond

10 Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the signature page.

11 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be

construed as a statutory bond and not as a common law bond.

12 DEFINITIONS

12.1 Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract and by all amounts withheld by the Owner in response to stop notices served upon the Owner, unless and until such stop notices are released.

12.2 Construction Contract: The agreement between the Owner and the Contractor identified on the signature page, including all Contract Documents and changes thereto.

12.3 Contractor Default: Failure of the Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Construction Contract.

Signed and sealed this \_\_\_\_\_ day of \_\_\_\_\_,  
(Contractor)

**CONTRACTOR AS PRINCIPAL**

**SURETY**

Company: \_\_\_\_\_ (Corporate Seal)

Company: \_\_\_\_\_ (Corporate Seal)

Signature: \_\_\_\_\_

Signature: \_\_\_\_\_

Name: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Title: ***Attorney-in-Fact***

Bond No. _____
----------------

**PAYMENT BOND**

This bond is issued simultaneously with performance bond in favor of the Owner conditioned on the full and faithful performance of the contract

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

KNOW ALL BY THESE PRESENT: that *(Here insert full name and address of CONTRACTOR)*

as Principal, hereinafter called Principal; and *(Here insert full name and address of SURETY)*

as Surety, hereinafter Surety, are held and firmly bound unto *(Full name and address of OWNER)*

Great Basin Unified Air Pollution Control District  
157 Short Street  
Bishop, CA 93514

as Obligee, hereinafter called Owner, for the use and benefit of claimants as herein below defined, in the amount of:

**Amount:        \$**

for the payment whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal has by written agreement entered into a contract with Owner in accordance with the Drawings, Specifications and Addenda for:

**CONSTRUCTION CONTRACT**

Date:

Project: (Spec#, Name & Location)

which contract is by reference made a part hereof, and is hereinafter referred to as the Construction Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if Principal shall promptly (1) make payment to all claimants as hereinafter defined, for all labor and material used or reasonably required for use in the performance of the Contract, and (2) pay all amounts due under the California Unemployment Insurance Code with respect to work or labor performed under the Contract, and (3) pay for any amounts required to be deducted, withheld, and paid over to the California Employment Development Department from the wages of employees of the Principal and subcontractors pursuant to Section 13020 of the California Unemployment Insurance Code with respect to the work and labor, then this obligation shall be void; otherwise it shall remain in full force and effect, subject, however, to the following conditions:

1 A claimant is defined as any of the persons named in Section 3181 of the California Civil Code.

2 The above-named Principal and Surety hereby jointly and severally agree with the Owner that every claimant as herein defined, or its assign, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant's work or labor was done or performed, or materials were furnished by such claimant, may sue on this bond for the use of such claimant, prosecute the suit to final judgment for such sum or sums as may be justly due claimant, including reasonable attorney's fees to be fixed by the court, and have execution thereon. The Owner shall not be liable for the payment of any costs or expenses of any such suit.

3 No suit or action shall be commenced hereunder by any claimant:

- a) Unless written notice has been given in compliance with California Civil Code section 3252.

b) After the expiration of one (1) year following the date on which Principal ceased Work on said Contract, it being understood, however, that if any limitation embodied in this bond is prohibited by any law controlling the construction hereof such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

c) Other than in a state court of competent jurisdiction in and for the county or other political subdivision of the state in which the Project, or any part thereof, is situated, or in the United States District Court for the district in which the Project, or any part thereof, is situated, and not elsewhere.

4 The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of mechanics' liens which may be filed of record against said improvement, whether or not claim for the amount of such lien be presented under and against this bond.

Signed and sealed this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_  
(Contractor)

**CONTRACTOR AS PRINCIPAL**  
Company: \_\_\_\_\_ (Corporate Seal)

**SURETY**  
Company: \_\_\_\_\_ (Corporate Seal)

Signature: \_\_\_\_\_

Signature: \_\_\_\_\_

Name: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Title: ***Attorney-in-Fact***

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## **COMPLETION AND ACCEPTANCE**

### **CA-01 Inspection**

The Work will be inspected by the District for acceptance upon receipt of the Contractor's written representation that the Work has been completed.

If, in the District's judgment, the Work has been completed and is ready for acceptance, it will so certify the completion of the work.

All work shall be guaranteed by the Contractor against defective workmanship and materials furnished by the Contractor for a period of 1 year from the date the Work was completed. The Contractor shall replace or repair any such defective work in a manner satisfactory to the District, after notice to do so from the District, and within the time specified in the notice. If the Contractor fails to make such replacement or repairs within the time specified in the notice, the District may perform this work and the Contractor's sureties shall be liable for the cost thereof.

### **CA-02. Acceptance and Repair**

Neither the final certificate of payment nor and provision in the contract documents nor partial or entire occupancy by the District shall constitute an acceptance of work not done in strict compliance with the contract documents or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor shall remedy any defects in the work and pay for any damage to other work resulting therefrom.

### **CA-03. Warranty and Guarantee**

The Contractor's warranty and guarantee shall include the entire Work and all parts thereof, including that performed and constructed by Subcontractors, Sub-subcontractors, and others employed directly or indirectly on and for the Work, against faulty or defective materials, equipment, or workmanship for a period of one (1) year from the date of the District's written final acceptance of the Work or such longer period of time as may be prescribed by the terms of any special guarantee or warranty required by the Contract Documents, or by law. The only exception to this guarantee shall be the equipment, which shall be guaranteed for one (1) year from the date each item of equipment, itself, is placed in service. The District will give notice of observed defects with reasonable promptness.

### **CA-04. Final Payment Declaration**

Prior to final payment, the Contractor shall provide a declaration certifying that all labor and material has been paid for, together with releases from all subcontractors and materialmen, or documenting all outstanding obligations. Contractor shall also, in writing, waive all claims by the Contractor against the District, or document all outstanding claims.

### **CA-05. Payment Only In Accordance With Contract**

The Contractor shall not demand nor be entitled to receive payment for the Work or materials, nor any portion thereof, except in the manner set forth in the Contract.

**CA-06. Substantial Completion**

At the discretion of the District, part or all of the project may be placed into operation prior to full completion of the work. If applicable, the District may not assess liquidated damages to that portion of the work, after the date of substantial completion.

**CA-07. Monies May Be Retained**

The District may retain any monies which would otherwise be payable at any time hereunder, and apply the same, or so much as may be necessary therefore, to the payment of any expenses, losses, or damages, as determined by the District, incurred by the District, for which the Contractor is liable under the Contract.

## PROPOSAL REQUIREMENTS

### **PR-01 Technical Proposal**

The Technical Proposal will allow the bidder to demonstrate understanding of the project, and to supply information regarding experience on similar projects. The Technical Proposal should be submitted separately from the Cost Proposal, in a separate envelope marked with the Bid Number, the Bidder Name and address, the Specification Number, and the label "Technical Proposal". Minimum information to be supplied in the Technical Proposal includes:

1. Project Understanding. A statement of your understanding of the nature of the project, its timelines, and all aspects of its implementation including agency and land owner requirements and limitations.
2. Technical Approach. Provide a statement of how you will approach this project, including the order in which you would implement the different project elements, any approaches you would take to realize cost savings and implementation efficiencies, and any innovative technologies or materials that would meet the project goals within the limitations of the stated specifications. Show a proposed schedule for accomplishing the work in the time frame required.
3. Experience. Provide an experience record showing successful completion, as a General Contractor, Class A, of at least 3 similar projects within the last 10 years. Previous work experience within the Owens Lake area and under similar climatic conditions is preferred. Experience of subcontractors may be included for this requirement. Describe any experience you have with working with Tribal members associated with project implementation.
4. Key personnel. Additionally, Contractors must include resumes of key personnel, including subcontractors, proposed to work on this project when submitting a proposal. This information will be critical in determining the most responsible bidder. Indicate the availability of key personnel for participation in this project for the time frame required.
5. The Proposal must include the location of the place of business, and the California contractor license of the prime contractor. In addition, pursuant to Section 4104 of the Public Contract Code, the name, the location of the place of business, and the California contractor license number of each subcontractor who will perform work or labor or render service to the prime contractor in or about the construction of the work or improvement, or a subcontractor licensed by the State of California who, under subcontract to the prime contractor, specially fabricates and installs a portion of the work or improvement according to detailed drawings contained in the plans and specifications, in an amount in excess of one-half of 1 percent of the prime contractor's total bid.
6. Evidence of good faith outreach for hiring from the local workforce and for involving local Tribal members in project implementation. Describe what you have done, or plan to do, as a good faith outreach for meeting local and tribal hiring goals.

### **PR-02 Cost Proposal**

The Cost Proposal should be submitted separately from the Technical Proposal, in a separate envelope marked with the Bid Number, the Bidder Name and address, the Specification Number, and the label "Cost Proposal". Minimum information to be supplied in the Cost Proposal include:

1. All bid sheets filled out in their entirety
2. Acknowledgement of any and all Addenda that may be issued associated with this solicitation

### **PR-03 Factors for Evaluation**

Each Technical Proposal will be evaluated first to determine if the proposer or team is qualified to perform the work. Experience and project personnel will weigh most heavily in this decision; approach and schedule will be considered secondarily. Then, the Cost Proposals for all qualified proposers will be opened and considered. Cost will be the deciding factor among all bidders determined to be qualified.

***Failure to submit any of the above-mentioned information with your bid "may" deem your bid non-responsive.***



## **PROPOSAL CHECKLIST**

The following must be submitted in order for the proposal to be complete:

1. Technical Proposal (separate packet; to include the following):
  - a. Statement of Technical Qualifications
  - b. Subcontractor List
  - c. Non-Collusion Statement
  - d. Statement of Surety
  - e. Cashier's Check for Bond
2. Cost Proposal (separate packet)
  - a. Bidding Sheets
  - b. Acknowledgement of all Addenda
3. Proper labeling of both Technical and Cost Proposal packets

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**ATTACHMENT A**  
**PERMIT DOCUMENTS AND REQUIRED PLANS**

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## **STORM WATER POLLUTION PROTECTION PLAN**

~~**(PROVIDED UNDER SEPARATE COVER)**~~



---

## **Storm Water Pollution Prevention Plan**

Keeler Dunes  
Keeler, California

*Prepared for:*

**Great Basin Unified Air Pollution Control District**  
California

*Prepared by:*

**AMEC Environment & Infrastructure, Inc.**  
2101 Webster Street, 12th Floor  
Oakland, California 94612

April 2014

Project No.1355400568

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**STORM WATER POLLUTION PREVENTION PLAN**  
Keeler Dunes  
Keeler, California

**QUALIFIED SWPPP DEVELOPER**

Approval and Certification of the Storm Water Pollution Prevention Plan

Project Name: Keeler Dunes

Project Number: \_\_\_\_\_

“This Storm Water Pollution Prevention Plan and Attachments were prepared under my direction to meet the requirements of the California Construction General Permit (SWRCB Orders No. 2009-009-DWQ as amended by Order 2010-0014-DWQ). I certify that I am a Qualified SWPPP Developer in good standing as of the date below.”

\_\_\_\_\_  
QSD Signature

James Honniball

QSD Name

Senior Scientist, AMEC, Inc.

Title and Affiliation

Jim.honniball@amec.com

Email

\_\_\_\_\_  
Date

#00013

QSD Certification Number

510-663-4100 or 510-663-4108

Telephone Number



**STORM WATER POLLUTION PREVENTION PLAN**  
 Keeler Dunes  
 Keeler, California

**LEGALLY RESPONSIBLE PERSON**

Approval and Certification of the Storm Water Pollution Prevention Plan

Project Name: Keeler Dunes

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

_____	_____
Signature of Legally Responsible Person (LRP [or Approved Signatory])	Date

_____	<u>Great Basin Unified Air Pollution Control District</u>
Name of LRP or Approved Signatory	Company

_____	_____
Title	Telephone Number



**STORM WATER POLLUTION PREVENTION PLAN**  
Keeler Dunes  
Dunes, California

**AMENDMENT LOG**

Project Name: Keeler Dunes

Project Number:

Amendment No.	Date	Brief Description of Amendment, include section and page number	Prepared and Approved By
			Name:
			QSD#
			Name:
			QSD#
			Name:
			QSD#
			Name:
			QSD#
			Name:
			QSD#
			Name:
			QSD#
			Name:
			QSD#
			Name:
			QSD#
			Name:
			QSD#

## **STORM WATER POLLUTION PREVENTION PLAN**

Keeler Dunes  
Keeler, California

### **1.0 STORM WATER POLLUTION PREVENTION PLAN REQUIREMENTS**

#### **1.1 INTRODUCTION**

This Storm Water Pollution Prevention Plan (SWPPP) has been prepared for Keeler Dunes for reseeding/planting/watering activities at Keeler Dunes (KD), located to the northwest of the community of Keeler in Inyo County, California ("the site), Figure 1. This project is being implemented by the Great Basin Unified Air Pollution Control District (GBUAPCD) to improve air quality through the reduction of particulate matter (PM10) emissions throughout the Owens Valley Planning Area (OVPA), consistent with the 2008 State Implementation Demonstration of Attainment Project. In particular, the purpose of this project is to reduce the exposure of residents of the communities of Keeler and Swansea to unhealthy levels of PM10 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 PM10 by 2017. The project will be implemented on 194 acres of the Keeler Dunes area. The goal of the project is to temporarily stabilize the surface of a portion of the Keeler Dunes with straw bales; and then, by planting and irrigating native shrubs associated with those bales, to create a permanently stabilized vegetated dune environment that mimics natural environments such as the existing Swansea Dunes (located to the northwest) and other stable shoreline dunes in the region (found both at Owens Lake and Mono Lake).

Revegetation, stabilization and watering activities will require temporary access roads in the KD during the course of the project. These access roads will not be stabilized with (supplemental materials such as asphalt or gravel, etc.) during reseeding/planting/watering activities until the final stages of the project. Following completion of planting and watering activities, the temporary access routes will be restored as necessary utilizing straw bales and native plants (the same method as used for the dust control areas of the project).

All Terrain Vehicles (ATVs) will be used on the temporary access roads. Based on discussions with the Lahontan Water Board, ATVs disturbance on the temporary access roads would qualify the project for coverage under the California State Water Resources Control Board (State Water Board) National Pollutant Discharge Elimination System (NPDES) General Permit for Storm water Discharges Associated with Construction and Land Disturbance Activities, Order No. 2009-0009-DWQ, NPDES No. CAS000002 (Construction General Permit [CGP]).

The CGP was adopted on September 2, 2009, which became effective on July 1, 2010. Order No. 2009-0009-DWQ was amended by Order No. 2010-0014-DWQ (NPDES No. CAS000002) on November 16, 2010 by the CSWRCB.

This SWPPP has been prepared to address revegetation, stabilization and watering activities within the KD. This SWPPP is designed to comply with the CGP and was prepared under the guidance of the California Storm Water Quality Association's (CASQA) SWPPP template and the CASQA Storm Water Best Management Practice Handbook: Construction (CASQA, 2010).

In accordance with the General Permit, Section XIV, this SWPPP is designed to address the following:

- Pollutants and their sources, including sources of sediment associated with construction, construction site erosion and other activities associated with construction activity are controlled;
- Where not otherwise required to be under a Water Board permit, all non-storm water discharges are identified and either eliminated, controlled, or treated;
- Site Best Management Practices (BMPs) are effective and result in the reduction or elimination of pollutants in storm water discharges and authorized non-storm water discharges from construction activity to the Best Available Technology/Best Control Technology (BAT/BCT) standard;
- Minimize runoff into and off the construction area;
- Stabilization BMPs installed to reduce or eliminate pollutants after construction are completed;
- Design details as well as BMP controls are complete and correct; and
- Identify and provide methods to implement the Rain Event Action Plan (REAP) if applicable.

## **1.2 PERMIT REGISTRATION DOCUMENTS**

Permit Registration Documents (PRDs) are required and must be submitted to the State Water Board via the Storm Water Multi Application and Report Tracking System (SMARTS) by the LRP (GBUAPCD) or authorized personnel (i.e. Approved Signatory) under the direction of the GBUAPCD. The project-specific PRDs include:

1. Notice of Intent (NOI);
2. Risk Assessment (Construction Site Sediment and Receiving Water Risk Determination);
3. Site Map;
4. Annual Fee;
5. Signed Certification Statement (LRP Certification is provided electronically with SMARTS PRD submittal); and
6. SWPPP.

The PRDs can be found in Appendix C along with the Waste Discharge Identification (WDID) confirmation. The WDID number issued for the site is \_\_\_\_\_.

### **1.3 SWPPP AVAILABILITY AND IMPLEMENTATION**

The SWPPP shall be available at the construction site during working hours while construction is occurring and shall be made available upon request by a State or Municipal inspector. If the original SWPPP is retained by a crewmember in a construction vehicle and is not currently at the construction site, current copies of BMPs and figure(s) will be left with the field crew and the original SWPPP shall be made available via a request by radio/telephone.

The SWPPP shall be implemented concurrently with the start of ground disturbing activities.

### **1.4 AMENDMENTS**

Amendment of the SWPPP is required when:

- There are BMP and monitoring requirements that are inconsistent with the CGP;
- There is a reduction or increase in total disturbed acreage;
- BMPs do not meet the objectives of reducing or eliminating pollutants in storm water discharges;
- There is a change in construction or operations which may affect the discharge of pollutants to surface water;
- There is a change in the project duration that changes the project's risk level;
- Notified by the Lahontan Regional Water Quality Control Board (Water Board) to amend this SWPPP; or
- Deemed necessary by the Qualified SWPPP Developer (QSD).

All amendments to the SWPPP must be documented. Amendment forms are included as Appendix A. The forms are used to document the specific amendment and describe the purpose of the amendment. The following items will be included in the amendment:

- Who requested the amendment;
- The location of the proposed change;
- The reason for change;
- The original BMP proposed, if any; and
- The new proposed or revised BMP.

Amendment shall be logged at the front of the SWPPP and certification kept in Appendix B. The SWPPP text shall be revised, replaced, and/or hand annotated as necessary to properly convey the amendment.

SWPPP amendments must be made by a QSD. However, the QSD may delegate completing SWPPP amendments to the Qualified SWPPP Practitioner (QSP) regarding the change to a



type, location, or quantity of an erosion or sediment control measure. The QSP shall confirm all amendments with QSD.

The following changes have been designated by the QSD as "to be field determined" and constitute minor changes that the QSP may implement based on field conditions.

- Increase quantity of an erosion or sediment control measure
- Relocate or add toilets
- Changes to access points (entrance/exits)
- Minor changes to schedule or phases

This SWPPP will be amended prior to implementing earthmoving activities for any unforeseen new phases associated with the project if necessary. This SWPPP is a working document and will be updated to reflect current site conditions accordingly.

### **1.5 RETENTION OF RECORDS**

Paper or electronic records required by the CGP will be retained for a minimum of three years from the date generated or date submitted, whichever is later.

These records shall be available at the site until construction is complete. Records assisting in the determination of compliance with the CGP shall be made available within a reasonable time, to the Water Board, State Water Board or U.S. Environmental Protection Agency (EPA) upon request. Requests by the Regional Water Board for retention of records for a period longer than three years shall be adhered to.

### **1.6 NON-COMPLIANCE REPORTING**

If a discharge or activity that is in violation of the CGP is observed, the QSP will notify the QSD and \_\_\_\_\_, or GBUAPCD designated representative as soon as feasible. GBUAPCD will notify the Regional Water Board in writing within seven days and by electronically submitting a violation report on SMARTS within 30 days from the time the non-compliance activity was observed. Corrective measures will be implemented as soon as feasible following the observed non-compliance issue. Corrective actions will be documented on the Notice of Non-Compliance form in Appendix C. Completed Notice of Non-Compliance forms will be placed in Appendix D.

The non-compliance report from the GBUAPCD to the Lahontan Water Board will contain the following items:

- The date, time, location, nature of operation and type of unauthorized discharge.
- The cause or nature of the non-compliance.
- The control measures or BMPs deployed before the discharge event, or prior to receiving notice of the non-compliance.
- The date of deployment and type of control measures (BMPs) deployed after the discharge event, or after receiving the notice or order, including additional measures installed or planned to reduce or prevent re-occurrence.

## **1.7 ANNUAL REPORT**

Annual reports are to be submitted on SMARTS data base system no later than September 1 of each year. The annual report must be certified by the GBUAPCD in accordance with the Special Provisions of the CGP and a copy must be retained (electronic or paper copy) for a minimum of three years after the date the annual report is filed.

The annual report shall contain the following:

1. A summary and evaluation of sampling and analysis results, including copies of laboratory reports;
2. Analytical methods, reporting units, method detection limits or each analytical parameter (analytical results that are less than the method detection limit shall be reported as less than the method detection limit);
3. A summary of corrective actions taken during the compliance year;
4. Identification of any compliance activities or corrective actions that were not implemented;
5. A summary of violations of the CGP;
6. Names of individual(s) who performed the facility inspections, sampling, visual observations (inspections) and/or measurements;
7. The date, place, and time of facility inspections, sampling, visual observations (inspections) and/or measurements, including precipitation (rain gauge);
8. The visual observation and sample collection exception records and reports for Risk Level 1 requirements;
9. Documentation of training for individuals responsible for activities associated with compliance to the CGP;
10. Documentation of training for individuals responsible for BMP installation, inspection, maintenance and repair; and
11. Documentation of training for individuals responsible for overseeing, revising and amending the SWPPP.

## **1.8 CHANGES TO PERMIT COVERAGE**

The CGP allows for the reduction or increase of the total acreage covered under the CGP when: a portion of the project is complete and/or conditions for termination of coverage have been met; when ownership of a portion of the project is purchased by a different entity; or

when new acreage is added to the project. The SWPPP will be modified appropriately, shall be logged at the front of the SWPPP and certification of SWPPP amendments are to be kept in Appendix B.

Modified PRDs will be filed electronically on SMARTS within 30 days of a reduction or increase in total disturbed area.

### **1.9 NOTICE OF TERMINATION**

A Notice of Termination (NOT) must be submitted electronically by the LRP (GBUAPCD) via SMARTS to terminate coverage under the CGP. The NOT must include a final site map and representative photographs of the project site that demonstrate final stabilization has been achieved. The NOT shall be submitted within 90 days of completion of construction. The Regional Water Board will consider a construction site complete when the following conditions of the CGP, Section II.D have been met.

- For purposes of final stabilization, the site will not pose a higher sediment discharge risk than prior to the commencement of construction activity.
- There is no potential discharge of construction-related storm water pollutants. Final stabilization has been achieved.
- Construction materials and on-site waste have been properly removed.
- Compliance with Post-Construction Standards in Section XIII of the CGP have been demonstrated.
- Post construction storm water management measures have been installed and a long term maintenance plan has been established
- All construction related equipment, materials and temporary BMPs are removed from the site.
- The owner shall certify that final stabilization conditions have been achieved in the NOT submittal. Failure to certify will result in continuing permit coverage and annual billing.

To document final stabilization, photos should be taken of the completed project and electronically filing the NOT on SMARTS. In addition, analysis of final stabilization shall be performed by one of the following methods:

1. 70% final coverage method, no computational proof required or
2. RULSE or RULSE2 method, computational proof required or
3. Custom method, the discharger shall demonstrate in some other manner than 1 or 2 above that the site complies with the final stabilization (the site will not pose additional sediment discharge risk than it did prior to the commencement of construction activity).

## **2.0 PROJECT INFORMATION**

### **2.1 PROJECT AND SITE DESCRIPTION**

#### **2.1.1 Site Description**

The KD 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. The KD project is located to the northwest of the community of Keeler in Inyo County, California and extends approximately 2.5 miles to the northwest from the community of Keeler and is bisected by California State Route (SR) 136. The project is located at latitude 36.503419 and longitude -117.895966 (Figure 1).

#### **2.1.2 Existing Conditions**

The site is an 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 and is mostly flat and covered with sand dunes with sparse vegetation.

#### **2.1.3 Existing Drainage**

The Sierra Nevada casts the valley in a rain shadow, which makes Owens Valley the Land of Little Rain. The bed of Owens Lake, now a predominantly dry endorheic alkali flat, sits on the southern end of the valley. Water from the site ultimately drains into the Owens River from runoff or directly into Owens Lake bed.

Storm water discharges from the construction site are considered direct discharges as defined by the State Water Board.

#### **2.1.4 Geology and Groundwater**

Current geologic conditions includes Cajon gravelly sand, loamy sand, gravelly loamy sand, playa dune land, rock outcrops and the following complexes: Cajon-Typic Torriothents, Mazourka-Eclipse Mazourka-Eclipse, Mazourka-Pokonahbe, Seaman-Yellowrock Cajon, Torrifluvents, Torrifluvents-Fluvaquentic Endloaquolls, Yellowrock-Seaman, Yermo stony-Yermo, and has 0 to 5 percent slopes. Based on the soil type and slope of the project area according to United States Department of Agriculture Websoil website below, off-road/offsite erosion is slight.

<http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>

Depth to groundwater may range from 4 to 7 feet at the site. It is anticipated that groundwater would be deeper in the desert environment. No excavation at the site is planned except for horizontal drilling under highway 136 to plumb an existing groundwater well (KCSD well) to irrigate the native shrubs use for remediation.

### 2.1.5 Project Description

The Project is to temporarily stabilize the surface of a portion of the Keeler Dunes with straw bales; and then, by planting and irrigating native shrubs associated with those bales, to create a permanently stabilized vegetated dune environment that mimics natural environments such as the existing Swansea Dunes (located to the northwest) and other stable shoreline dunes in the region (found both at Owens Lake and Mono Lake). Key construction details for the project include the establishment of four temporary staging areas, installation of irrigation system with directional drilling to the supply groundwater well, particulate PM10 monitoring, and revegetation activities at the project site.

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). 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).

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, 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). 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). 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.

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.

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).

More details of the project description can be found in the Right of way permit (Form 299) Bureau of Land Management, Project Description, Keeler Dunes Dust Control Project, March 2014 (Appendix E).

### 2.1.6 Developed Condition and Construction Site Estimates

Upon completion of the project, post construction drainage conditions are anticipated to be similar to conditions prior to stabilizing with hay bales and native shrubs. The enhanced shrubbery will minimize erosion.

Pre and post construction site estimates are listed below:

Construction site area	194 acres
Percentage impervious area before construction	less than 5 %
Runoff coefficient before construction	0.2
Percentage impervious area after construction	less than 5 %
Runoff coefficient after construction	0.2

## 2.2 PERMITS AND GOVERNING DOCUMENTS

In addition to the CGP, the following documents have been taken into account while preparing this SWPPP:

- Right of way permit (Form 299) Bureau of Land Management, Project Description, Keeler Dunes Dust Control Project Plan (KDDCPP), March 2014
- Access letter from Los Angeles Department of Water and Power
- Right of way from Caltrans for installation of temporary water line under Highway 136
- EIR/EA report
- Keeler Dunes Dust Control Project Biological Resources Technical Report (Sapphos Environmental, Inc, 2013)

### 2.3 STORM WATER RUN-ON FROM OFFSITE AREAS

General topography of the site slopes from the north/northeast to south/southwest. There is no potential from stormwater runoff from adjacent areas onto the project site. The topographic map and hydrological drainage areas are shown on Figure 2.

If stormwater run-on does occur due to heavy thunderstorm activity (monsoonal moisture during July-September) it will be determined in the field by the site construction manager under the direction of the QSP. The BMP map will be updated as necessary to reflect current site conditions.

### 2.4 FINDINGS OF THE CONSTRUCTION SITE SEDIMENT AND RECEIVING WATER RISK DETERMINATION

A construction site risk assessment has been performed for the project. Values for soil risk determination were obtained from the State Water Board Geographic Information Service Statewide Google Application map.

The risk level was determined through the use of the EPA Rainfall Erosivity Calculator, GIS Map, the list of Clean Water Act 303(d) impaired waters for sediment/siltation, EPA approved TMDL implementation plan for sediment and designated beneficial uses of spawn, cold and migratory. The risk level determination is based on project duration, location, proximity to impaired waters, and soil conditions. This project has been determined to be Risk Level 1. A copy of the Risk Level determination is included in Appendix F.

A summary of the sediment risk calculation is presented below.

#### Summary of Sediment Risk

RUSLE Factor	Value	Method for establishing value	
R	35.51	EPA Online Rainfall Erosivity Calculator for Small Construction Sites	
K	0.15	State Water Board RUSLE K Factor Statewide GIS Map	
LS	1.23	State Water Board LS Table Appendix 1 (average of WWRA and soil disposal areas for Phase 1)	
<b>Total Predicted Sediment Loss (tons/acre)</b>			<b>6.55</b>
<b>Overall Sediment Risk</b> Low Sediment Risk < 15 tons/ acre Medium Sediment Risk >= 15 and < 75 tons/acre High Sediment Risk >= 75 tons/acre			<input checked="" type="checkbox"/> <b>Low</b> <input type="checkbox"/> <b>Medium</b> <input type="checkbox"/> <b>High</b>

Storm water discharges into Water from the site ultimately drains into the Owens River from runoff or directly into Owens Lake bed. The summary of receiving water risk for the project is presented below.



### Summary of Receiving Water Risk

Receiving Water Name	303(d) Listed for Sediment Related Pollutant <sup>(1)</sup>	TMDL for Sediment Related Pollutant <sup>(1)</sup>	Beneficial Uses of COLD, SPAWN, and MIGRATORY <sup>(1)</sup>
Lower Owens River and Owens Lake	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>Overall Receiving Water Risk</b>			<input checked="" type="checkbox"/> <b>Low</b> <input type="checkbox"/> <b>High</b>
(1) If yes is selected for any option the Receiving Water Risk is High			

Risk Level 1 sites are subject to narrative action limitations but **not** numeric action standards. The narrative effluent limitations require storm water discharges associated with construction activity to minimize or prevent pollutants in storm water and authorized non-storm water through the use of controls, structures and best management practices. Discharges from Risk Level 1 site are **not** subject to NALs for pH and turbidity shown below. This SWPPP has been prepared to address Risk Level 1 requirements in the CGP's Attachment C.

Numeric Action Levels		
Parameter	Unit	Numeric Action Level Daily Average
pH	pH units	Lower NAL = 6.5 Upper NAL = 8.5
Turbidity	NTU	250 NTU

## 2.5 CONSTRUCTION SCHEDULE

The anticipated project schedule is from August 2014 through December 2017. The estimated schedule for the planned work is listed below.

### Phase 1— Establish Staging Areas 1, 2, 3, and 4

- Created by brushing, no grading needed or allowed (by Bureau of Land Management), flat, sandy areas established August 2014
- Completed (no longer in use) December 2017
- Area 1: 300 x 500'
- Area 2: 200 x 400'
- Area 3: 150 x 300'
- Area 4 10 x 200'

### Phase 2—Directional Drilling

- Established September 2014



- Each area about 50 x 50 feet, basically flat, sandy soil. NE area already disturbed (dirt access track to well; turn-around area)
- Completed (to be restored) November 2014

#### Phase 3—Establishment of Access Routes

- Exact location not known, as will be determined by vegetation patterns
- Approximate length is 12,000 feet and width is 6 feet
- Will be used regularly (all weekdays) between August 2014 and January 2015
- Will be used intermittently February 2015-December 2017

#### Phase 4—Stabilizing Access Route

- Revegetation of access routes to match remedial shrub planting plan October – December 2017

#### Phase 5—Demobilization

- Remove equipment December 2017

## **2.6 POTENTIAL CONSTRUCTION ACTIVITY AND POLLUTANT SOURCES**

Appendix G includes a list of construction activities and materials that are anticipated to be used onsite. These activities and materials could potentially introduce pollutants into storm water runoff, in addition to sediment.

Construction activities and potential pollutants were evaluated to select BMPs for the project described in Section 3.0. Potential sources of non-sediment pollutants during earth moving activities could originate from earth moving equipment and trucks, where oil and hydraulic leaks may occur. Heavy equipment is stored on site as part of vineyard operations and will remain on site during the construction activities. The BMP implementation plan will be updated as needed for the duration of the project. Location of anticipated pollutants (soil sediments during excavation) and associated BMPs are shown on the BMP implementation plan, Figure 3.

Sampling requirements for non-visible pollutants associated with construction activity can be viewed in Section 7.7.1.

## **2.7 IDENTIFICATION OF NON-STORM WATER DISCHARGES**

Non-storm water discharges consist of water not originating from precipitation events. The CGP provides allowances for specified non-storm water discharges provided that they do not cause erosion or contain other pollutants.

Non-storm water discharges not authorized under the CGP and listed in the SWPPP, or authorized under a separate NPDES permit, are prohibited.

Authorized and un-authorized non-storm water discharges from the construction site are not anticipated. Watering the planting areas, soil stockpiles and access roads may be necessary

to control fugitive dust. Water will be applied in a manner to prevent ponding and runoff (non-authorized storm water). Groundwater (authorized non-storm water) may be used as a source of water for dust control and a source of irrigation of newly planted vegetation. Appropriate BMPs will be implemented in the equipment staging and construction material storage areas to prevent non-storm water discharges if needed.

BMPs will be implemented to verify that unauthorized discharges are eliminated, controlled, disposed of, or treated on-site. Unauthorized non-storm water discharges will be managed with the storm water and non-storm water BMPs described in Section 3 of this SWPPP.

## **PROHIBITED (ILLICIT) DISCHARGES**

Non-storm water discharges into waterways, which are not authorized under the CGP or authorized under a separate NPDES permit, are prohibited. Examples of prohibited discharges for the project include:

- Vehicle and equipment cleaning, fueling and maintenance operations;
- Runoff from dust control applications of water or dust palliatives; and
- Sanitary and septic wastes.

Chemical leaks and/or spills including petroleum, cure compounds, and those listed in Section 7.7.1.

Activities at this site that may result in unauthorized non-storm water discharges include:

- Establishing staging areas 1, 2, 3, and 4
- Temporary directional drilling
- Installation of irrigation conveyance system
- Revegetation activities

Discharges of construction materials and wastes, such as fuel or spills that have direct contact with rainwater or storm water runoff are also prohibited.

## **2.8 REQUIRED SITE MAP INFORMATION**

The construction project's site maps show the project location, surface water boundaries, geographic features, construction site perimeter, direction of storm water flow, and other requirements as defined in the CGP are included in Figure 2. BMPs will be added to the BMP implementation map as necessary during project. The BMP implementation map will be updated as necessary throughout the project.

## **3.0 BEST MANAGEMENT PRACTICES**

### **3.1 SCHEDULE FOR BMP IMPLEMENTATION**

The schedule for implementing the relevant BMPs is included on Table 1. BMPs in Table 1 will be implemented as required in each phase of construction. Some of these BMPs are

supplemental and may be used if necessary. The BMPs listed in Table 1 are part of a BMP “tool box” that may be used in the field and implemented based on field conditions for the specific phases of the project. These BMPs can be used individually or in combination.

BMPs shall be implemented with the following guidelines and in accordance with the BMP Fact Sheets provided in Appendix H. If there is a conflict between documents, the site map will prevail over narrative in the body of the SWPPP or guidance in the BMP Fact Sheets. Site specific details in the site map prevail over standard details included in the site map. The narrative in the body of the SWPPP prevails over guidance in the BMP Fact Sheets.

### **3.2 EROSION AND SEDIMENT CONTROL**

Erosion and sediment controls are required by the CGP to provide effective reduction or elimination of sediment related pollutants in storm water discharges and authorized non-storm water discharges from the site. Applicable BMPs are identified in this section for erosion, sediment, tracking , and wind erosion control.

#### **3.2.1 Erosion Control**

Erosion control (also referred to as soil stabilization) consists of source control measures that are designed to prevent soil particles from detaching and becoming transported in storm water runoff. Erosion control BMPs protect the soil surface by covering and/or binding soil particles. This construction project will implement the following erosion control practices to provide effective temporary and final erosion control during construction:

1. Preserve existing vegetation where required and when feasible.
2. The area of soil disturbing operations shall be controlled such that the Contractor is able to implement erosion control BMPs quickly and effectively.
3. Stabilize non-active areas within 14 days of cessation of construction activities or sooner if stipulated by local requirements.
4. Control erosion in concentrated flow paths by applying erosion control blankets, check dams, erosion control seeding or alternate methods.
5. Prior to the completion of construction, apply permanent erosion control to remaining disturbed soil areas.

Sufficient erosion control materials shall be maintained onsite to allow implementation in conformance with this SWPPP.

Table 2 describes the BMPs that can be implemented for temporary erosion control erosion on the construction site. BMPs will be selected to address site conditions. Fact Sheets are provided in Appendix I. The BMPs presented below are part of the BMP “tool box”. BMPs will be selected and implemented in the field based on site conditions. The BMP inspection form is located in Appendix J.

### **Scheduling, BMP Fact Sheet EC-1**

The schedule for this project is between August, 2014 and December 2017. During August Phase 1 will be completed with Phase 2. Additional planting will be completed as necessary. Phase 2 construction of the EWRA will be performed during the dry season and stabilized prior to the rainy season similar to Phase - 1.

### **Preservation of Existing Vegetation, BMP Fact Sheet EC-2**

Existing brush and vegetation within the project area will be protected during revegetation activities as a BMP as much as practical. Some brush removal is necessary at the staging areas for storage of equipment and straw bales, native plants, and supplies by the contractors.

### **Geotextiles and Mats, BMP Fact Sheets EC-7**

Erosion control blankets maybe applied to protect the soil in the staging areas until vegetation become established near the end of the project. These erosion control blankets may be used elsewhere on the project if necessary.

### **Wind Erosion Control, BMP Fact Sheet WE-1**

Stockpiles, access roads and staging areas will be protected from wind erosion by applying dust control water as needed or limit driving speed to 5 to 10 miles per hour. The dust control water will be applied at a rate and volume so as not to create runoff. Use non-vegetative stabilization BMP Fact Sheet EC-16 if necessary.

### **3.2.2 Sediment Control**

Sediment controls are temporary or permanent structural measures that are intended to complement the selected erosion control measures and reduce sediment discharges from active construction areas. Sediment controls are designed to intercept and settle out soil particles that have been detached and transported by the force of water.

The temporary sediment control BMP selection table (Table 3) indicates BMPs that may be implemented to control sediment on the construction site. Fact Sheets for temporary sediment control BMPs are provided in Appendix H.

### **Silt Fence, BMP Fact Sheet SE-1**

Silt fence may be installed at the limits of construction boundaries at the staging areas as described in Figure 3. Silt fences may tear during windy conditions and become nonfunctional. Fiber rolls (SE-5) should be considered and implemented instead if necessary and field determined.

### **Fiber Rolls, BMP Fact Sheet SE-5**

Fiber rolls may be installed at the limits of construction boundaries at the staging areas as described in Figure 3. This BMP may be easier to install than silt fences and will be determined in the field. During windy conditions, silt fences will tear and become non-functional.

### **Street Sweeping, BMP Fact Sheet SE-7**

Tracking of sediment from the staging areas is anticipated in staging areas 1, 2 and 3. Therefore stabilized construction exit/entrance is necessary. The need for street sweeping will be evaluated in the field and implemented if necessary for areas 1, 2 and 3 since there is little traffic on Old State Highway and has deteriorated pavement and not maintained. Sand drifts occur on the Old State Highway. The highway is closed from staging area 3 to Keeler where it is used for ATV travel. For access area 4, street sweeping is not necessary since the Haul Road is paved with gravel. Sweeping may be necessary at the junction of the Haul Road and Highway 136. This area must be stabilized with construction roadway and or construction entrance/exit. If sweeping is performed at stages 1, 2 and 3 and at the junction of the Haul Road and Highway 136, the appropriate health and safety equipment, traffic control and protective clothing shall be worn.

### **Stabilized Construction Entrance/Exit, BMP Fact Sheet TC-1**

Stabilizing of the construction entrance/exit will be necessary for staging areas 1, 2 and 3 with shaking/rattle/rumble plates or similar leading onto the Old State Highway. Similar stabilization shall be performed at the junction of the Haul Road and Highway 136.

### **Stabilized Construction Roadway, BMP Fact Sheet TC-2**

The temporary access routes leading from the staging areas will be stabilized with metal plate during construction or with other methods recommended in BMP fact sheet TC-2 in Appendix H to prevent excessive rutting in the traveled areas. The length of metal plating will be determined in the field.

## **3.3 NON-STORM WATER CONTROLS AND WASTE AND MATERIALS MANAGEMENT**

### **3.3.1 Non-Storm water Controls**

Non-storm water discharges into storm drainage systems or waterways, which are not authorized under the CGP, are prohibited. Non-storm water discharges for which a separate NPDES permit is required by the local Regional Water Board are prohibited unless coverage under the separate NPDES permit has been obtained for the discharge. The selection of non storm water BMPs is based on the list of construction activities with a potential for non-storm water discharges identified in Section 2.7 of this SWPPP.

The non-storm water BMP selection table (Table 4) presents BMPs that may be implemented to control sediment on the construction site. Fact Sheets for temporary non-storm water control BMPs are provided in Appendix H.

#### **Water Conservation Practices, BMP Fact Sheet NS-1**

The appropriate amount of water will be applied for dust control. Water for dust control may be obtained from the KCSD well located on-site. .

#### **Illicit Connection- Illegal Discharge Connection, BMP Fact Sheet NS-6**

The entrance to the access areas will be locked during non operation hours and the construction site will be inspected for illicit dumping or discharges prior to and during construction activities.

#### **Vehicle and Equipment Cleaning, BMP Fact Sheet NS-8**

All equipment used to haul, transport, or excavate soil can be cleaned on vineyard property. Any water used during cleaning of vehicles and equipment adjacent to the construction will be controlled and not permitted to discharge into wetland areas.

#### **Vehicle and Equipment Fueling, BMP Fact Sheet NS-9**

Refueling equipment on site will be completed by portable tanks away from storm water conveyances (i.e. storm drains, ditches, etc.). Spill response materials will be on hand to address incidental fuel spills if necessary.

#### **Vehicle and Equipment Maintenance, BMP Fact Sheet NS-10**

Vehicle and equipment maintenance will be conducted at another location on the vineyard property unless infeasible to do so. Vehicles and construction equipment will be maintained on a regular basis to prevent drips, leaks, or spills of any fluids. Drip pans will be used if necessary to catch any discovered leaks until repairs can be made.

### **3.3.2 Materials Management and Waste Management**

Materials management control practices consist of implementing structural and non-structural BMPs for handling and storing construction materials to prevent an unauthorized discharge. The amount and type of construction materials at the site will depend upon the type of construction and the length of the construction period. Waste management consists of implementing structural and non-structural BMPs for handling, storing and ensuring proper disposal of wastes to prevent an unauthorized discharge.

Materials and waste management pollution control BMPs shall be implemented to minimize storm water contact with construction materials, and to prevent materials and waste from

being discharged off-site. The primary mechanisms for storm water contact with materials on site shall be addressed and include:

- Direct contact with precipitation;
- Contact with storm water run-on and runoff for materials stored on Site;
- Wind dispersion of loose materials;
- Direct discharge to the storm drain system through spills or dumping; and
- Extended contact with materials and wastes which can leach pollutants into storm water.

A list of anticipated construction activities are provided in Section 2.6. The Materials and Waste Management BMP selection table (Table 5) presents BMPs that may be implemented to address construction materials and control waste associated with construction activities. Fact Sheets for Materials and Waste Management BMPs are provided in Appendix H.

#### **Material Delivery and Storage, BMP Fact Sheet WM-1**

All materials and equipment brought to the site will be stored appropriately in the equipment staging area so as not to cause potential impacts to storm water runoff.

#### **Material Use, BMP Fact Sheet WM-2**

Any materials used on site will be used appropriately so as not to cause potential impacts to storm water runoff.

#### **Stockpile Management, BMP Fact Sheet WM-3**

It is anticipated that no soil stockpiles will be generated during the dust control project. However in the event that soil stock piles are generated, stockpile management will be required.

Sediment control measures will be placed at the perimeter of the overburden stockpile area will be surrounded with straw wattles and or sandbags to prevent soil from eroding and to prevent upgradient storm water runoff from contacting the stockpile. Stockpiles will be temporarily covered with visqueen until erosion control measures are used (either WE-1, SE-5 or in combination).



#### **Spill Prevention and Control, BMP Fact Sheet WM-4**

Materials, liquids, and equipment will be stored, handled, or used away from storm drains and storm water conveyances. At least one prominently marked spill kit will be stored at the site in order to clean up any spills as soon as possible. If a spill occurs beyond what can be controlled with the contents of the spill kit, a spill response contractor will be contacted and brought to the site to clean up the spill.

#### **Solid Waste Management, BMP Fact Sheet WM-5**

Solid waste composed of vines and grasses will be collected in a designated area and removed from the site so as not to impact storm water runoff.

#### **Sanitary-Septic Waste Management, BMP Fact Sheet WM-9**

If on-site bathroom facilities are not available during the implementation of the corrective action plan, a portable toilet will be located within the construction staging area away from storm water drains or drainage ditches and properly maintained.

### **3.4 POST CONSTRUCTION STORM WATER MANAGEMENT**

Post construction BMPs are permanent measures installed during construction, designed to reduce or eliminate pollutant discharges from the site after construction is completed.

Pre-construction conditions at the site include flat sandy areas with shrubbery.

Post construction conditions will match pre-construction conditions and retain existing drainage patterns as much as practicable with increased shrubbery to minimize dust per the March 2014 KDDCPP.

### **4.0 BMP INSPECTION AND MAINTENANCE**

The CGP requires routine weekly inspections of BMPs, along with inspections before, during, and after qualifying rain events. A BMP inspection checklist must be filled out for inspections and maintained on-site with the SWPPP. The inspection checklist includes the necessary information covered in Section 7.6. A blank inspection checklist can be found in Appendix I. Completed checklists shall be kept in Construction Site management Plan (CSMP). The CSMP can be viewed in Attachment 1 "Monitoring Records". BMPs shall be maintained regularly to ensure proper and effective functionality. Corrective actions shall be implemented within 72 hours of identified deficiencies and associated amendments to the SWPPP shall be prepared by the QSD, if necessary.

Specific details for maintenance, inspection, and repair of construction site BMPs can be found in the BMP Factsheets in Appendix I.



**5.0 TRAINING**

Appendix J identifies the QSPs for the project. To promote storm water management awareness specific for this project, periodic training of job-site personnel shall be included as part of routine project meetings (e.g. daily/weekly tailgate safety meetings), or task specific trainings as needed.

The QSP shall be responsible for providing this information at the meetings, and subsequently completing the training logs shown in Appendix K, which identifies the site-specific storm water topics covered as well as the names of site personnel who attended the meeting. Tasks may be delegated to trained employees by the QSP provided adequate supervision and oversight is provided. Training shall correspond to the specific task delegated including SWPPP implementation, BMP inspection and maintenance, and record keeping.

Documentation of training activities (formal and informal) is retained in SWPPP Appendix M.

**6.0 RESPONSIBLE PARTIES AND OPERATORS**

**6.1 RESPONSIBLE PARTIES**

Approved Signatories who are responsible for SWPPP implementation and have authority to sign permit-related documents are listed below. Written authorizations from \_\_\_\_\_ for these individuals are provided in Appendix L. The Approved Signatories assigned to this project are:

Name	Title	Phone Number

The QSP shall have primary responsibility and significant authority for the implementation, maintenance and inspection/monitoring of SWPPP requirements. The QSP will be available at all times throughout the duration of the project. Duties of the QSP include implementing elements of the CGP and SWPPP as well as the following:

- Ensuring all BMPs are implemented, inspected, and properly maintained;
- Performing non-storm water and storm water visual observations and inspections;
- Performing non-storm water and storm sampling and analysis, as required;
- Performing routine inspections and observations;

- Implementing non-storm water management, and materials and waste management activities such as: monitoring discharges; general site clean-up; vehicle and equipment cleaning, fueling and maintenance; spill control; ensuring that no materials other than storm water are discharged in quantities which will have an adverse effect on receiving waters or storm drain systems; etc.
- The QSP may delegate these inspections and activities to an appropriately trained employee, but shall ensure adequacy and adequate deployment.
- Ensuring elimination of unauthorized discharges.
- The QSPs shall be assigned authority by the LRP to mobilize crews in order to make immediate repairs to the control measures.
- Coordinate with the Contractor(s) to assure all of the necessary corrections/repairs are made immediately and that the project complies with the SWPPP, the CGP and approved plans at all times.
- Notifying the Project Manager immediately of off-site discharges or other non-compliance events.

## 6.2 CONTRACTOR LIST

The prime contractor for this project is listed below. Additional contractors who may work on the project who will be directed by the QSP are listed in Appendix M.

### Prime Contractor Contact (to be determined)

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_

Phone Number: \_\_\_\_\_

Cell Phone Number: \_\_\_\_\_

Email: \_\_\_\_\_

## 7.0 CONSTRUCTION SITE MONITORING PROGRAM

### 7.1 PURPOSE

This Construction Site Monitoring Program (CSMP) was developed to address the following objectives:

1. To demonstrate that the site is in compliance with the Discharge Prohibitions of the CGP and Numeric Action Levels (NALs) of the CGP;
2. To determine whether non-visible pollutants are present at the construction site and are causing or contributing to exceedances of water quality objectives;

3. To determine whether immediate corrective actions, additional BMP implementation, or SWPPP revisions are necessary to reduce pollutants in storm water discharges and authorized non-storm water discharges; and
4. To determine whether BMPs included in the SWPPP are effective in preventing or reducing pollutants in storm water discharges and authorized non-storm water discharges.

## **7.2 APPLICABILITY OF PERMIT REQUIREMENTS**

This project has been determined to be a Risk Level 1 project. The CGP identifies the following types of monitoring as being applicable for a Risk Level 1 project.

- Visual inspections of BMPs;
- Visual monitoring of the site related to qualifying storm events;
- Visual monitoring of the site for non-storm water discharges;
- Sampling and analysis of construction site runoff for non-visible pollutants when applicable; and
- Sampling and analysis of construction site runoff as required by the Regional Water Board when applicable.

Applicable sections of the CGP for Risk Level 1 site is presented in Appendix N.

## **7.3 WEATHER AND RAIN EVENT TRACKING**

Tracking the weather and predicted rain events is a critical element of the CSMP.

Visual monitoring and inspections requirements of the CGP are triggered by a qualifying rain event. The CGP defines a qualifying rain event as any event that produces ½ inch of precipitation. A minimum of 48 hours of dry weather will be used to distinguish between separate qualifying storm events.

### **7.3.1 Weather Monitoring**

The QSP should monitor NOAA weather forecasts daily. These forecasts can be obtained at <http://www.srh.noaa.gov/>. Weather reports should be printed and maintained with the SWPPP in the CSMP Attachment 2 “Weather Reports”.

The quantitative precipitation forecast (QPF) that provides predictions for amount of rainfall in 6-hour intervals during the next three days for KD project is available at:

<http://www.wrh.noaa.gov/forecast/wxtables/index.php?lat=36.50853235745393&lon=-117.89016723632812&clrindex=0&table=custom&duration=7&interval=6>

### **7.3.2 Rain Gauges**

The QSP shall install a rain gauge at the project site. Locate the gauge in an open area away from obstructions such as trees or overhangs. Mount the gauge on a post at a height of 3 to 5 feet with the gauge extending several inches beyond the post. Verify that the top of the

gauge is level and that the mounting location is not in an area where rainwater can indirectly splash from sheds, equipment, trailers, etc. Weather monitoring devices have been observed at the site. If the weather monitoring devices have a rain gauge, there is no need to install additional rain gauges.

The rain gauge shall be read daily during normal site scheduled hours. The rain gauge should be read at approximately the same time every day and the date and time of each reading recorded. Rain gauge readings shall be logged in the CSMP Attachment 2 “Weather Records”. Follow the rain gauge instructions to obtain accurate measurements. Rain gauge log sheets are provided in Attachment 2.

Once the rain gauge reading has been recorded, accumulated rain shall be emptied and the gauge reset unless an automated recording rain gauge is used.

#### **7.4 MONITORING LOCATIONS**

Monitoring locations are shown on Figure 3. Monitoring locations are described in the Sections 7.6 and 7.7.

When changes in the construction site affect the sampling locations, the sampling locations shall be revised accordingly. All such revisions shall be implemented as soon as feasible and the SWPPP amended. Temporary changes that result in a one-time additional sampling location do not require a SWPPP amendment.

#### **7.5 SAFETY AND MONITORING EXEMPTIONS**

Safety practices will be in accordance with a safety plan prepared for KD Site. A summary of the safety requirements that apply to sampling personnel is provided below.

Collecting samples, if necessary or conducting visual observations (inspections) are not required under the following conditions:

- During dangerous weather conditions such as flooding and electrical storms.
- Outside of scheduled site business hours.

Scheduled site business hours are: to be determined

If monitoring (visual monitoring or sample collection) of the site is unsafe due to the dangerous conditions noted above, the QSP shall document the conditions for why an exception to performing the monitoring was necessary. The exemption documentation shall be filed in the CSMP Attachment 1 “Monitoring Records”.

#### **7.6 VISUAL MONITORING**

Visual monitoring includes observations and inspections. BMP inspections are required to identify and record BMPs that need maintenance, that have failed, or that have the potential to fail to operate as intended. Visual observations of the drainage areas are required to identify

any spills, leaks, or uncontrolled pollutant sources. The table below presents the required frequency of visual observations and inspections. Inspections and observations will be conducted at the locations identified in Section 7.6.3.

### Summary of Visual Monitoring and Inspections

Type of Inspection	Frequency
<i>Routine Inspections</i>	
BMP Inspections	Weekly <sup>1</sup>
BMP Inspections – Tracking Control	Weekly
BMP Inspections – Wind Erosion	Weekly
BMP Inspections – Soil Stockpiles if generated	Weekly
BMP Inspections – Silt Fences or Fiber Rolls	Weekly
Rain Gauge Recording	Daily
Non-Storm water Discharge Observations	Quarterly during daylight hours
<i>Rain Event Triggered Inspections</i>	
Site Inspections Prior to a Qualifying Event	Within 48 hours of a qualifying event <sup>2</sup>
BMP Inspections During an Extended Storm Event	Every 24-hour period of a rain event <sup>2, 3</sup>
Site Inspections Following a Qualifying Event	Within 48 hours of a qualifying event <sup>2</sup>

Notes:

1. Most BMPs must be inspected weekly. Those identified above must be inspected more frequently.
2. Inspections are only required during scheduled site operating hours and are required daily regardless of the amount of precipitation.
3. During extended rain events, inspections must be made daily until there are 48-hours without precipitation.

## 7.6.1 Routine Observations and Inspections

Routine site inspections and visual monitoring are necessary to ensure that the project is in compliance with the requirements of the CGP.

### 7.6.1.1 Routine BMP Inspections

Inspections of BMPs are conducted to identify and record the following:

- BMPs are properly installed;
- BMPs needing maintenance to operate effectively;
- BMPs that have failed; or
- BMPs that could fail to operate as intended.

### 7.6.1.2 Non-Storm water Discharge Observations

Each **staging area** will be inspected for the presence of or indications of prior unauthorized and authorized non-storm water discharges. Inspections will be conducted to identify and record the following:

- Presence or evidence of any non-storm water discharge (authorized or unauthorized);
- Pollutant characteristics (floating and suspended material, sheen, discoloration, turbidity, odor, etc.); and
- Source of discharge.

## **7.6.2 Rain-Event Triggered Observations and Inspections**

Visual observations of the site and inspections of BMPs are required prior to a qualifying rain event, following a qualifying rain event, and every 24-hour period during a qualifying rain event. Pre-rain inspections will be conducted after consulting NOAA and determining that a precipitation event with a 50% or greater probability of precipitation has been predicted.

### ***7.6.2.1 Visual Observations Prior to a Forecasted Qualifying Rain Event***

Pre-rain BMP inspections visual monitoring will be triggered by a NOAA forecast that indicates a probability of precipitation of 50% or greater for the site. Within 48-hours prior to a qualifying event, a storm water visual monitoring site inspection will be completed and include observations of the following:

- Storm water drainage areas - to identify any spills, leaks, or uncontrolled pollutant sources;
- BMPs - to identify if they have been properly implemented; and

### ***7.6.2.2 BMP Inspections during an Extended Storm Event***

During an extended rain event BMP inspections will be conducted to identify and record the following:

- BMPs are properly installed;
- BMPs need maintenance to operate effectively;
- BMPs that have failed; or
- BMPs that could fail to operate as intended.

If the construction site is not accessible during the rain event, the visual inspections shall be performed at all relevant outfalls, discharge points, downstream locations. The inspections should record any projected maintenance activities. Inspections must be performed every day during scheduled business hours until there are 48 hours without a precipitation event.

### ***7.6.2.3 Visual Observations Following a Qualifying Rain Event***

Within 48 hours following a qualifying rain event (0.5 inches of rain) a storm water visual monitoring site inspection is required to observe:

- Storm water drainage areas - to identify any spills, leaks, or uncontrolled pollutant sources;
- BMPs - to identify if they have been properly designed, implemented, and effective;

- Need for additional BMPs;
- Any storm water storage and containment areas to detect leaks and ensure maintenance of adequate freeboard; and
- Discharge of stored or contained rain water.

### 7.6.3 Visual Monitoring Procedures

Visual monitoring shall be conducted by the QSP or staff trained by and under the supervision of the QSP.

The name(s) and contact number(s) of the site visual monitoring personnel are listed below and their training qualifications are provided in Appendix K.

Assigned inspector: \_\_\_\_\_ Contact phone: \_\_\_\_\_

Assigned inspector: \_\_\_\_\_ Contact phone: \_\_\_\_\_

Storm water observations shall be documented on the Visual Inspection Field Log Sheet Appendix O. BMP inspections shall be documented on the site specific BMP inspection checklist. Any photographs used to document observations will be referenced on storm water site inspection report and maintained with the Monitoring Records in Attachment 1 with the appropriate BMP inspection form.

The QSP shall within seven days of the inspection submit copies of the completed inspection report to the QSD.

The completed reports will be kept in the CSMP Attachment 2 “Monitoring Records”.

### 7.6.4 Visual Monitoring Follow-Up and Reporting

Correction of deficiencies identified by the observations or inspections, including required repairs or maintenance of BMPs, shall be initiated and completed as soon as possible.

If identified deficiencies require design changes, including additional BMPs, the implementation of changes will be initiated within 72 hours of identification and be completed as soon as possible. When design changes to BMPs are required, the SWPPP shall be amended to reflect the changes.

Deficiencies identified in site inspection reports and correction of deficiencies will be tracked on the Inspection BMP Inspection Report and shall be submitted to the QSP and shall be kept in CSMP Attachment 2 “Monitoring Records”.

The QSP shall within three days of the inspection submit copies of the completed Inspection BMP Inspection Report with the corrective actions to the QSD.

Results of visual monitoring must be summarized and reported in the Annual Report.



### 7.6.5 Visual Monitoring Locations

The inspections and observations identified in Sections 7.6.1 and 7.6.2 will be conducted at the locations identified in this section.

BMP locations and drainage areas are shown on Figure 3. There are many drainage areas on the site, but the majority is within the planting plan restoration areas and these areas are not subject to construction related materials to cause impairment to water quality except ATV leaks. Areas of concern are primarily the temporary staging areas where remedial dust control materials and equipment storage are located. These temporary staging areas are 1, 2, 3, and 4. The table below identifies each drainage area by location.

Discharge Location	Description
Staging Area 1	Along the Old State Highway, this area is 300' x 50' and runoff originates from the remedial area and flows toward the staging area and onto the Old State Highway.
Staging Area 2	Along the Old State Highway, this area is 400' x 200' and runoff originates from the remedial area and flows toward the staging area and onto the Old State Highway.
Staging Area 3	Along the Old State Highway, this area is 300' x 150' and runoff originates from the remedial area and flows toward the staging area and onto the Old State Highway.
Staging Area 4	Along the Gravel Haul Road, this area is 300' x 10' and runoff originates from the east and may potentially flow toward the staging area into areas of the Keeler Dunes that are not in the Dust Control Planting Plan.

There are no storm water storage or containment areas on the project site.

## 7.7 WATER QUALITY SAMPLING AND ANALYSIS

### 7.7.1 Sampling and Analysis Plan for Non-Visible Pollutants in Storm water Runoff

This Sampling and Analysis Plan for Non-Visible Pollutants describes the sampling and analysis strategy and schedule for monitoring non-visible pollutants in storm water runoff discharges from the project site in case of observed spills or evidence of spills, if necessary.

Sampling for non-visible pollutants will be conducted when (1) a breach, leakage, malfunction, or spill is observed; and (2) the leak or spill has not been cleaned up prior to the rain event; and (3) there is the potential for discharge of non-visible pollutants to surface waters or drainage system.

The following construction materials, wastes, or activities, as identified in Section 2.6, are potential sources of non-visible pollutants to storm water discharges from the project. Storage, use, and operational locations are shown on Figure 3.

- Transporting hay bales and planting shrubbery.



Potential sources of non-visible pollutants from the project are from potential equipment leaks from ATVs and trucks during planting and watering.

- Oil, hydraulic fluids and fuel

#### **7.7.1.1 Sampling Schedule**

Samples for the potential non-visible pollutant(s) shall be collected during the first two hours of discharge from rain events that result in a sufficient discharge for sample collection. Samples shall be collected during the scheduled business hours and shall be collected regardless of the time of year and phase of the construction.

Collection of discharge samples for non-visible pollutants will be triggered when any of the following conditions are observed during site inspections conducted prior to or during a rain event.

- Materials or wastes containing potential non-visible pollutants are not stored under watertight conditions. Watertight conditions are defined as (1) storage in a watertight container, (2) storage under a watertight roof or within a building, or (3) protected by temporary cover and containment that prevents storm water contact and runoff from the storage area.
- Materials or wastes containing potential non-visible pollutants are stored under watertight conditions, but (1) a breach, malfunction, leakage, or spill is observed, (2) the leak or spill is not cleaned up prior to the rain event, and (3) there is the potential for discharge of non-visible pollutants to surface waters or a storm drain system.
- A construction activity, including but not limited to those in Section 2.6, with the potential to contribute non-visible pollutants (1) was occurring during or within 24 hours prior to the rain event, (2) BMPs were observed to be breached, malfunctioning, or improperly implemented, and (3) there is the potential for discharge of non-visible pollutants to surface waters or a storm drain system.
- Soil amendments that have the potential to change the chemical properties, engineering properties, or erosion resistance of the soil have been applied, and there is the potential for discharge of non-visible pollutants to surface waters or a storm drain system.

#### **7.7.1.2 Sampling Locations**

Sampling locations are based on proximity to planned non-visible pollutant storage, occurrence or use, accessibility for sampling and personnel safety. Use of non-visible pollutants is not anticipated during the project and therefore no storage areas of non-visible pollutants are identified in Figure 3. If non-visible pollutant products are used, this SWPPP will be updated to show the sampling locations on Figure 3 and identified in the table below.

No sampling locations on the project site have been identified for the collection of samples of runoff from non-visible pollutant sources produced during construction activities of the project.

The sample locations will be added to the SWPPP if there are suspected spills or breaches of BMPs for non-visible pollutants. The sample location (and any future identified locations) is listed below.

Sample Location Number	Sample Location Description	Sample Location Latitude and Longitude (Decimal degrees)
		Lat:
		Long:
		Lat:
		Long:
		Lat:
		Long:

The QSP shall identify a sampling location(s) for the collection of an uncontaminated sample of runoff as a background sample for comparison with the samples being analyzed for non-visible pollutants when a spill or breach in BMPs has occurred; and to evaluate if the spill or BMP repair has been adequately cleaned up or repaired. This location(s) shall be selected such that the sample will not have come in contact with the operations, activities, or areas identified in Section 7.7.1 or with disturbed soil areas. The description of the uncontaminated background sample will be entered into the table below once it has been determined.

Background Sample Location Number	Background Sample Location Description	Sample Location Latitude and Longitude (Decimal degrees)
		Lat:
		Long:
		Lat:
		Long:

### 7.7.1.3 Monitoring Preparation

Most likely the contractor or site manager may need to collect samples of unauthorized non-storm water discharges because these types of events are unplanned. Therefore, adequate laboratory sample containers, ice-chest, chain-of-custody (CoC) forms and supplies must be stored at the construction site at all times in the event sampling is necessary. The construction site manager or superintendant will contact a California State Certified Analytical laboratory to obtain the necessary sampling containers and supplies and stored onsite. The sample containers should represent the chemicals of concern identified in Section 7.1.4, Analytical Constituents and Tables 6 and 7 when applicable.

Non-visible pollutant samples will be collected by:

Contractor: Yes  No

Owner/LRP: Yes  No

**Samples collected by contractor**

Samples on the project site will be collected by the following contractor/owner sampling personnel:

Name/Telephone Number/Company: To be determined

Alternate(s)/Telephone Number/Company: To be determined

An adequate stock of monitoring supplies and equipment for monitoring non-visible pollutants will be available on the project site prior to a potential sampling event. Monitoring supplies and equipment will be stored in a cool temperature environment that will not come into contact with rain or direct sunlight. Sampling personnel will be available to collect samples in accordance with the sampling schedule. Supplies maintained at the project site will include clean powder-free nitrile gloves, sample collection equipment, coolers, appropriate number and volume of sample bottles, identification labels, re-sealable storage bags, paper towels, personal rain gear, and ice. A Visual Inspection and Sampling Field Log Sheet are provided in Appendix O.

**Samples collected by Owner/LRP.**

Samples on the project site will be collected by the following:

Company Name: To be determined

Street Address: \_\_\_\_\_

City, State Zip: \_\_\_\_\_

Telephone Number: \_\_\_\_\_

Point of Contact: \_\_\_\_\_

Name of Sampler(s): \_\_\_\_\_

Name of Alternate(s): \_\_\_\_\_

**7.7.1.4 Analytical Constituents**

In the event that BMPs fail in the storage areas and equipment leaks during soil stockpiling activities that have been exposed to storm water, the storm water runoff from these areas will be analyzed for the following constituents:

- Total petroleum hydrocarbons (TPH) as gasoline (TPHg) using Environmental Protection Agency (EPA) Method 8015B or 8260B;
- TPH as diesel (TPHd) and TPH as motor oil (TPHmo) using EPA Method 8015B following silica gel preparation; and
- VOCs using EPA Method 8260B.

If any of the other non-visible pollutant-triggering events listed in Section 7.7.1.1 occur, Tables 6 and 7, will be reviewed to determine which water quality indicators will be analyzed.

This section will be updated as needed during other construction phases.

**7.7.1.5 Sample Collection**

Storm water discharge samples shall be collected at the designated non-visible pollutant sampling locations. These locations will be determined in the field based on observed breaches, malfunctions, leakages, spills, operational areas, soil amendment application areas, and historical site usage areas that triggered the sampling event.

Grab samples shall be collected and preserved in accordance with the methods identified in Table 7.

Sample collection and handling requirements are described in Section 7.7.7.

**7.7.1.6 Sample Analysis**

Samples shall be analyzed using the analytical methods identified in the Table 7.12.

Samples will be analyzed by:

Laboratory Name: To be determined

Street Address: \_\_\_\_\_

City, State Zip: \_\_\_\_\_

Telephone Number: \_\_\_\_\_

Point of Contact: \_\_\_\_\_

ELAP Certification Number: \_\_\_\_\_

Samples will be delivered to the laboratory by:

Driven by Contractor: Yes  No

Picked up by Laboratory Courier: Yes  No

Shipped: Yes  No

Additional delivery information, contacts, and instructions regarding contractor delivery, courier services, and/or shipping details are included below.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

#### **7.7.1.7 Data Evaluation and Reporting**

The QSP shall perform an evaluation of the water quality sample analytical results. Discharge results shall be compared to upgradient background results. Should the discharge sample results show an increased level of the tested analyte relative to the unaffected background sample, the BMPs, site conditions, and surrounding influences shall be assessed to determine the probable cause for the increase.

Appropriate BMPs shall be repaired or modified to mitigate discharges of non-visible pollutant concentrations as determined by the site and data evaluation. Revisions to BMPs shall be recorded as an amendment to the SWPPP if necessary.

Storm water discharges that contain hazardous substances equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4 are prohibited as described in the CGP. Non-storm water discharge analytical results that indicate the presence of a hazardous substance in excess of established reportable quantities shall be immediately reported to the Regional Water Board and other agencies as required by 40 C.F.R. §§ 117.3 and 302.4.

Results of non-visible pollutant monitoring shall be reported in the Annual Report.

#### **7.7.2.3 Monitoring Preparation**

An adequate stock of monitoring supplies (i.e. sample bottles, powder-free nitrile gloves, ice-chest, chain-of-custody, etc) will be obtained from a California State Certified Analytical Laboratory and be on the project site during construction at all times. Monitoring supplies and equipment will be stored in a cool temperature environment that will not come into contact with rain or direct sunlight. Sampling supplies also include extra batteries, paper towels, personal rain gear, and zip-lock bags.

#### **7.7.3 Additional Monitoring Following a Numeric Effluent Limit Exceedance**

Numeric Effluent Limits (NEL) no longer apply to the CGP per the Superior Court of California order as of December 2, 2011, Case No. 34-2009-80000338. NELs also do not apply to this unless an active treatment system (ATS) is used. An ATS is not anticipated to be used at the site.

#### **7.7.4 Sampling and Analysis Plan for Non-Storm water Discharges**

This project is subject to the non-storm water sampling and analysis requirements of the CGP.

This Sampling and Analysis Plan (SAP) for non-storm water discharges describes the sampling and analysis strategy and schedule for monitoring pollutants in authorized and unauthorized non-storm water discharges from the project site in accordance with the requirements of the CGP.

Sampling of non-storm water discharges will be conducted when an authorized or unauthorized non-storm water discharge is observed during the project. In the event that non-storm water discharges run-on to the staging areas from the planting plan locations (Areas 1, 2 and 3) and offsite locations (Area 4) and has the potential to contribute non-visible pollutants, the run-on will also be sampled.

The following authorized non-storm water discharges identified in Section 2.7, have the potential to be discharged from the project site.

- Groundwater from KCSD well

In addition to the above authorized non-storm water discharges, some construction activities have the potential to result in an unplanned (unauthorized) non-storm water discharge if BMPs fail. These activities include:

- Equipment fueling
- Dust control water

This section will be update as necessary.

### **7.7.5 Sampling and Analysis Plan for Other Pollutants Required by the Regional Water Board**

The Regional Water Board has not specified monitoring for additional pollutants for the project. This section will be updated if applicable.

#### **7.7.5.1 Sampling Schedule**

There are no special sampling requirements from the Regional Water Board for the project. This section will be updated if applicable.

#### **7.7.5.2 Sampling Locations**

This section is not applicable to the project and will be updated accordingly if applicable.

Sample Location Number	Sample Location Description	Sample Location Latitude and Longitude (Decimal degrees)
		Lat:
		Long:

#### **7.7.5.3 Monitoring Preparation**

This section is not applicable for the project and will be updated as needed.

#### **7.7.5.4 Sample Collection**

This section is not applicable for the project and will be updated as needed.

**7.7.5.5 Sample Analysis**

This section is not applicable for the project and will be updated as needed.

**7.7.5.6 Data Evaluation and Reporting**

This section is not applicable for the project and will be updated as needed.

**7.7.6 Training of Sampling Personnel**

Sampling personnel shall be trained on procedures to collect, maintain, and transport samples. Training records of designated sampling personnel are provided in Appendix K.

The following is a list of storm water sampling personnel and storm water sampling training taken:

Name	Training
_____	_____
_____	_____
_____	_____

**7.7.7 Sample Collection and Handling**

**7.7.7.1 Sample Collection**

Samples shall be collected at the designated sampling locations shown on the site maps and listed in the preceding sections.

Grab samples shall be collected and preserved in accordance with the appropriate means and methods.

To maintain sample integrity and prevent cross-contamination, sample collection personnel shall follow the protocols below.

- Collect samples (for laboratory analysis) in analytical laboratory-provided sample containers;
- Wear clean, powder-free nitrile gloves;
- Change gloves whenever if gloves come in contact with material that could affect analytical results;
- Change gloves between sampling locations;
- Decontaminate all equipment (e.g. bucket, tubing) prior to sample collection using a trisodium phosphate water wash, distilled water rinse, and final rinse with distilled water. (Dispose of wash and rinse water appropriately, i.e., do not discharge to storm drain or receiving water). Do not decontaminate laboratory provided sample containers;
- Do not smoke during sampling events;
- Never sample near a running vehicle;

- Do not park vehicles in the immediate sample collection area and turn off vehicles engines );
- Do not eat or drink during sample collection; and
- Do not breathe, sneeze, or cough in the direction of an open sample container.

The most important aspect of grab sampling is to collect a sample that represents the entire runoff stream. Samples are to be collected by dipping the collection container in the concentrated flow as noted below.

1. Simply dip the bottle facing upstream until full to avoid any contamination by the sampler. Collect a sample in the middle of the concentrated flow by directly dipping the mouth of the bottle.
2. Avoid collecting samples from ponded, sluggish or stagnant water.
3. Avoid collecting samples directly downstream from the road surface.

Note that, some containers may contain preservatives. These containers should never be dipped into the flow path but filled indirectly from the collection container.

#### **7.7.7.2 Sample Handling**

Initiate the following procedures immediately following sample collection:

- Cap sample containers;
- Complete sample container labels;
- Seal containers in a re-sealable storage bag;
- Place sample containers into an ice-chilled cooler;
- Document sample information on the Sampling Field Log Sheet; and
- Complete the Chain of Custody (CoC).

All samples for laboratory analysis must be maintained between 32 to 42.8 degrees Fahrenheit (0 to 6 degrees Celsius) during delivery to the laboratory. Samples must be kept on ice, or refrigerated, from sample collection through delivery to the laboratory. Verify the sample bottles are packaged to prevent breakage during transport to the laboratory and secure cooler lids with packaging tape.

Samples should be transported to the laboratory as soon as possible. Sample hold times are measured from the time the sample is collected to the time the sample is analyzed. The CGP requires that samples be received by the analytical laboratory within 48 hours of the physical sampling (unless required sooner by the analytical laboratory). Contact information for the laboratory selected to perform the analysis of storm water samples for the project is listed below.



Laboratory Name: To be determined

Street Address: \_\_\_\_\_

City, State Zip: \_\_\_\_\_

Telephone Number: \_\_\_\_\_

Point of Contact: \_\_\_\_\_

### **7.7.7.3 Sample Decontamination Procedures**

All original data documented on sample bottle identification labels, Sampling Field Log Sheet, and CoCs shall be recorded using waterproof ink. These shall be considered accountable documents. If an error is made on an accountable document, the individual shall make corrections by lining through the error and entering the correct information. The erroneous information shall not be obliterated. All corrections shall be initialed and dated.

Duplicate samples shall be identified consistent with the numbering system for other samples to prevent the laboratory from identifying duplicate samples. Duplicate samples shall be identified in the Sampling Field Log Sheet.

Sample documentation procedures include the following:

Sample Bottle Identification Labels: Sampling personnel shall attach an identification label to each sample bottle. Sample identification shall uniquely identify each sample location.

Field Log Sheets: Sampling personnel shall complete the Sampling Field Log Sheet and Receiving Water Sampling Field Log Sheet for each sampling event, as appropriate.

Chain of Custody: Sampling personnel shall complete the CoC for applicable samples collected for laboratory analysis. The sampling personnel will sign the CoC when samples are transferred to the testing laboratory or courier.

## **7.8 ACTIVE TREATMENT SYSTEM MONITORING**

Groundwater dewatering is not necessary during the project and therefore an Active Treatment System (ATS) will not be deployed on the site.

## **7.9 BIOASSESSMENT MONITORING**

This project is not subject to bioassessment monitoring per the CGP because it is not a Risk Level 3 project.

## **7.10 WATERSHED MONITORING OPTION**

This project is not participating in a watershed monitoring option.

## **7.11 QUALITY ASSURANCE AND QUALITY CONTROL**

An effective Quality Assurance and Quality Control (QA/QC) plan shall be implemented as part of the CSMP to ensure that analytical data can be used with confidence. QA/QC procedures to be initiated include the following:

- Field logs;
- Clean sampling techniques;
- CoCs;
- QA/QC Samples; and
- Data verification.

Each of these procedures is discussed in more detail in the following sections.

### **7.11.1 Field Logs**

The purpose of field logs is to record sampling information and field observations during monitoring that may explain any uncharacteristic analytical results. Sampling information to be included in the field log include the date and time of water quality sample collection, sampling personnel, sample container identification numbers, and types of samples that were collected. Field observations should be noted in the field log for any abnormalities at the sampling location (color, odor, BMPs, etc.). A Visual Inspection and Sampling Field Log Sheet are provided in Appendix O.

### **7.11.2 Clean Sampling Techniques**

Clean sampling techniques involve the use of certified clean containers for sample collection and clean powder-free nitrile gloves during sample collection and handling. As discussed in Section 7.7.7, adoption of a clean sampling approach will minimize the chance of field contamination and questionable data results.

### **7.11.3 Chain of Custody**

The sample CoC is an important documentation step that tracks samples from collection through analysis to ensure the validity of the sample. Sample CoC procedures include the following:

- Proper labeling of samples;
- Use of CoC forms for all samples; and
- Prompt sample delivery to the analytical laboratory.

An example of a CoC is included in the CSMP Attachment 3 “Supplemental Information”.

#### 7.11.4 QA/QC Samples

QA/QC samples provide an indication of the accuracy and precision of the sample collection, sample handling, field measurements, and analytical laboratory methods. The following QA/QC will be conducted:

- Field Duplicates at a frequency of 1 per every 10 samples or 1 per sample event
- Equipment Blanks at a frequency of 1 per day or 1 per sample event if sampling equipment is used.
- Field Blanks at a frequency of 1 per day or 1 per sample event
- Travel Blanks at a frequency of 1 per each sample event for VOCs.

##### 7.11.4.1 Field Duplicates

Field duplicates provide verification of laboratory or field analysis and sample collection. Duplicate samples shall be collected, handled, and analyzed using the same protocols as primary samples. The sample location where field duplicates are collected shall be randomly selected from the discharge locations. Duplicate samples shall be collected immediately after the primary sample has been collected. Duplicate samples must be collected in the same manner and as close in time as possible to the original sample. Duplicate samples shall not influence any evaluations or conclusion.

##### 7.11.4.2 Equipment Blanks

Equipment blanks provide verification that equipment has not introduced a pollutant into the sample. Equipment blanks are typically collected when:

- New equipment is used;
- Equipment that has been cleaned after use at a contaminated site;
- Equipment that is not dedicated for surface water sampling is used; or
- Whenever a new lot of filters is used when sampling metals.

##### 7.11.4.3 Field Blanks

Field blanks assess potential sample contamination levels that occur during field sampling activities. De-ionized water field blanks are taken to the field, transferred to the appropriate container, and treated the same as the corresponding sample type during the course of a sampling event.

##### 7.11.4.4 Travel Blanks

Travel blanks assess the potential for cross-contamination of volatile constituents between sample containers during shipment from the field to the laboratory. Laboratory-prepared de-

ionized water blanks are taken along for the trip and held unopened in the same cooler with the VOC samples.

#### **7.11.5 Data Verification**

After results are received from the analytical laboratory, the QSP or designee shall verify the data to ensure that it is complete, accurate, and the appropriate QA/QC requirements were met. Data must be verified when the analytical reports are received. Data verification shall include:

- Review the CoC and laboratory reports. Make sure all requested analyses were performed and all samples are accounted for in the reports.
- Review laboratory reports to make sure hold times were met and that the reporting levels meet or are lower than the reporting levels agreed to in the contract.
- Review data for outlier values and follow up with the laboratory. Occasionally typographical errors, unit reporting errors, or incomplete results are reported and should be easily detected. These errors need to be identified, clarified, and corrected quickly by the laboratory. The QSP or designee should especially note data that is an order of magnitude or more different than similar locations, or is inconsistent with previous data from the same location.
- Review laboratory QA/QC results. EPA establishes QA/QC checks and acceptable criteria for laboratory analyses. These data are typically reported along with the sample results. The QSP or designee shall evaluate the reported QA/QC data to check for contamination (method, field, and equipment blanks), precision (laboratory matrix spike duplicates), and accuracy (matrix spikes and laboratory control samples). When QA/QC checks are outside acceptable ranges, the laboratory must flag the data, and usually provides an explanation of the potential impact to the sample results.
- Review the data set for outlier values and, accordingly, confirm results and re-analyze samples where appropriate. Sample re-analysis should only be undertaken when it appears that some part of the QA/QC resulted in a value out of the accepted range. Sample results may not be discounted unless the analytical laboratory identifies the required QA/QC criteria were not met and confirms this in writing.

Field data including inspections and observations must be verified as soon as the field logs are received, typically at the end of the sampling event. Field data verification shall include:

- Review field logs to make sure all required measurements were completed and appropriately documented;
- Review reported values that appear out of the typical range or inconsistent; Follow-up immediately to identify potential reporting or equipment problems, if appropriate, recalibrate equipment after sampling;
- Verify equipment calibrations;
- Review observations noted on the field logs; and

- Review notations of any errors and actions taken to correct the equipment or recording errors.

## **7.12 RECORDS RETENTION**

All records of storm water monitoring information and copies of reports (including Annual Reports) must be retained for a period of at least three years from date of submittal or longer if required by the Regional Water Board.

Results of visual monitoring, field measurements, and laboratory analyses must be kept in the SWPPP along with CoCs, and other documentation related to the monitoring.

Records are to be kept onsite while construction is ongoing. Records to be retained include:

- The date, place, and time of inspections, sampling, visual observations, and/or measurements, including precipitation;
- The individual(s) who performed the inspections, sampling, visual observation, and/or field measurements;
- The date and approximate time of field measurements and laboratory analyses;
- The individual(s) who performed the laboratory analyses;
- A summary of all analytical results, the method detection limits and reporting limits, and the analytical techniques or methods used;
- Rain gauge readings from site inspections;
- QA/QC records and results;
- Calibration records;
- Visual observation and sample collection exemption records; and
- The records of any corrective actions and follow-up activities that resulted from analytical results, visual observations, or inspections.

## 8.0 REFERENCES

California Storm water Quality Association (CASQA), 2009, Storm Water BMP Handbook Portal: Construction, November.

State Water Resources Control Board, 2009, Order 2009-0009-DWQ, NPDES General Permit No. CAS000002: National Pollutant Discharges Elimination System (NPDES) California General Permit for Storm water Discharge Associated with Construction and Land Disturbing Activities. Available on-line at:  
[http://www.waterboards.ca.gov/water\\_issues/programs/Storm\\_water/construction.shtml](http://www.waterboards.ca.gov/water_issues/programs/Storm_water/construction.shtml).

State Water Resources Control Board, 2010, Order 2010-0014-DWQ, NPDES General Permit No. CAS000002: National Pollutant Discharges Elimination System (NPDES) California General Permit for Storm water Discharge Associated with Construction and Land Disturbing Activities. Available on-line at:  
[http://www.waterboards.ca.gov/water\\_issues/programs/Storm\\_water/construction.shtml](http://www.waterboards.ca.gov/water_issues/programs/Storm_water/construction.shtml).

**TABLES**

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**TABLE 1**  
**BMP IMPLEMENTATION SCHEDULE**  
 Keeler Dunes  
 Keeler, California

<b>Best Management Practice (BMP)</b>		<b>Implementation</b>	<b>Duration</b>
<b>Erosion Control</b>	EC-1, Scheduling	Prior to Construction	Entirety of Project
	EC-2, Preservation of Existing Vegetation	Start of Construction	Entirety of Project
	EC-7, Geotextile and Mats	To be Determined	To be Determined
	WE-1, Wind Erosion Control	Start of Construction	Entirety of Project
<b>Sediment Control</b>	SE-1, Silt Fence	Prior to Construction	Entirety of Project
	SE-5, Fiber Rolls	Start of Construction	Entirety of Project
	SE-7, Street Sweeping	Start of Construction	Entirety of Project
	TC- 1, Stabilized Construction Entrance/Exit	Start of Construction	Entirety of Project
	TC-2, Stabilized Construction Roadway	Start of Constuction	Entirety of Project
<b>Non-Storm Water</b>	NS-1, Water Conservation Practices	Start of Construction	Entirety of Project
	NS-6, Illicit Connection - Illegal Discharge Connection	Start of Construction	Entirety of Project
	NS-8, Vehicle and Equipment Cleaning	Start of Construction	Entirety of Project
	NS-9, Vehicle and Equipment Fueling	Start of Construction	Entirety of Project
	NS-10, Vehicle and Equipment Maintenance	Start of Construction	Entirety of Project
<b>Waste Management</b>	WM-1, Material Delivery and Storage	Start of Construction	Entirety of Project
	WM-2, Material Use	Start of Construction	Entirety of Project
	WM-3, Stockpile Management	Start of Stockpile Construction	Entirety of Project
	WM-4, Spill Prevention and Control	Start of Construction	Entirety of Project
	WM-5, Solid Waste Management	Start of Construction	Entirety of Project
	WM-9, Sanitary-Septic Waste Management	Start of Construction	Entirety of Project



**TABLE 2**  
**TEMPORARY EROSION CONTROL BMPs**  
 Keeler Dunes  
 Keeler, California

CASQA Fact Sheet	Best Management Practice (BMP) Name	Meets a Minimum Requirement <sup>1</sup>	BMP Used		If not used, state reason:
			Yes	No	
EC-1	Scheduling	X	X		
EC-2	Preservation of Existing Vegetation	X	X		
EC-3	Hydraulic Mulch			X	Not applicable
EC-4	Hydroseed			X	Not applicable
EC-5	Soil Binders			X	Not applicable
EC-6	Straw Mulch			X	Not applicable
EC-7	Geotextiles and Mats		X		Not anticipated to be used; determined in the field
EC-8	Wood Mulching			X	Not applicable
EC-9	Earth Dike and Drainage Swale			X	Not applicable
EC-10	Velocity Dissipation Devices			X	Not applicable
EC-11	Slope Drains			X	Not applicable
EC-12	Stream Bank Stabilization			X	Not applicable
EC-14	Compost Blankets			X	Not applicable
EC-15	Soil Preparation-Roughening			X	Not applicable
EC-16	Non-Vegetated Stabilization			X	Not applicable
WE-1	Wind Erosion Control	X	X		
<b>List alternate BMPs used and state reason, if used:</b>					

**Notes**

1. Applicability to a specific project shall be determined by the QSD.
2. The QSD shall ensure implementation of one of the minimum measures listed or a combination thereof to achieve and maintain the Risk Level requirements.

**TABLE 3**  
**TEMPORARY SEDIMENT CONTROL BMPS**  
 Keeler Dunes  
 Keeler, California

CASQA Fact Sheet	Best Management Practice (BMP) Name	Meets a Minimum Requirement <sup>1</sup>	BMP Used		If not used, state reason:
			Yes	No	
SE-1	Silt Fence	X <sup>2</sup>	X		
SE-2	Sediment Basin			X	Significant sediment-laden runoff not expected.
SE-3	Sediment Trap			X	Not applicable
SE-4	Check Dams			X	Not applicable
SE-5	Fiber Rolls	X <sup>2</sup>	X		
SE-6	Gravel Bag Berm			X	Not applicable
SE-7	Street Sweeping	X	X		
SE-8	Sandbag Barrier			X	Not applicable
SE-9	Straw Bale Barrier			X	Not anticipated to be used; determined in the field
SE-10	Storm Drain Inlet Protection			X	No storm drains on site
SE-11	Active Treatment Systems			X	Not applicable
SE-12	Temporary Silt Dike			X	Not applicable
SE-13	Compost Sock and Berm			X	Not applicable
SE-14	Biofilter Bags			X	Not applicable
TC-1	Stabilized Construction Entrance/Exit	X	X		
TC-2	Stabilized Construction Roadway	X	X		
TC-3	Entrance/Outlet Tire Wash			X	Not applicable
<b>List alternate BMPs used and state reason, if used:</b>					

Notes

1. Applicability to a specific project shall be determined by the QSD.
2. The QSD shall ensure implementation of one of the minimum measures listed or a combination thereof to achieve and maintain the Risk Level requirements.

**TABLE 4**  
**TEMPORARY NON-STORM WATER BMPS**  
 Keeler Dunes  
 Keeler, California

CASQA Fact Sheet	Best Management Practice (BMP) Name	Meets a Minimum Requirement <sup>1</sup>	BMP Used		If not used, state reason:
			Yes	No	
NS-1	Water Conservation Practices	X	X		
NS-2	Dewatering Operations			X	Not applicable
NS-3	Paving and Grinding Operations			X	Not applicable
NS-4	Temporary Stream Crossing			X	Not applicable
NS-5	Clear Water Diversion			X	Not applicable
NS-6	Illicit Connection-Illegal Discharge Connection	X	X		
NS-7	Potable Water Irrigation Discharge Detection			X	Not applicable
NS-8	Vehicle and Equipment Cleaning	X	X		
NS-9	Vehicle and Equipment Fueling	X	X		
NS-10	Vehicle and Equipment Maintenance	X	X		
NS-11	Pile Driving Operation			X	Not applicable
NS-12	Concrete Curing			X	Not applicable
NS-13	Concrete Finishing			X	Not applicable
NS-14	Material and Equipment Use Over Water			X	Not applicable
NS-15	Demolition Removal Adjacent to Water			X	Not applicable
NS-16	Temporary Batch Plants			X	Not applicable
<b>List alternate BMPs used and state reason, if used:</b>					

Notes

1. Applicability to a specific project shall be determined by the QSD.

**TABLE 5**  
**WASTE MANAGEMENT BMPS**  
 Keeler Dunes  
 Keeler, California

CASQA Fact Sheet	Best Management Practice (BMP) Name	Meets a Minimum Requirement <sup>1</sup>	BMP Used		If not used, state reason:
			Yes	No	
WM-1	Material Delivery and Storage	X	X		
WM-2	Material Use	X	X		
WM-3	Stockpile Management	X	X		
WM-4	Spill Prevention and Control	X	X		
WM-5	Solid Waste Management	X	X		
WM-6	Hazardous Waste Management			X	Not applicable
WM-7	Contaminated Soil Management			X	Not applicable
WM-8	Concrete Waste Management			X	Not applicable
WM-9	Sanitary-Septic Waste Management	X	X		
WM-10	Liquid Waste Management			X	Not applicable
<b>List alternate BMPs used and state reason, if used:</b>					

Notes

1. Applicability to a specific project shall be determined by the QSD.

**TABLE 6**

**COMMON NON-VISIBLE POLLUTANTS AND WATER QUALITY INDICATOR CONSTITUENTS**

Keeler Dunes  
Keeler, California

<b>General Work Activity/Potential Pollutants</b>	<b>Water Quality Indicators of Potential Constituents</b> (Review product literature and Material Safety Data Sheets to confirm potential constituents)
<b>Cleaning</b>	
Acids	pH
Bleaches	Residual chlorine
TSP	Phosphate
Solvents	VOCs, SVOCs
Detergents	MBAS
<b>Grading / Earthworks</b>	
Directional Drilling mud/soil cutting	solids, turbidity, pH, specific conductance, TSS
Soil	solids, turbidity
<b>Construction Access Roads</b>	
Soil disturbance	dust, particulates
<b>Planting / Vegetation Management</b>	
Vegetation stockpiles	BOD
Fertilizers	TKN, NO <sub>3</sub> , BOD, COD, DOC, sulfate, NH <sub>3</sub> , Phosphate, Potassium
<b>Sanitary Waste</b>	
Portable Toilets (using clear fluid - blue fluid is visible if discharged)	BOD, Total/Fecal coliform
<b>Solid Waste (leakage)</b>	
BOD	
<b>Vehicle and Equipment Use</b>	
Fuels, greasing equipment	TPHg, TPHd, TPHmo, Oil and grease
Batteries	Sulfuric acid; Pb, pH

Reference

Adapted from *Attachment S, Caltrans SWPPP/WPCP Preparation Manual, February 2003, and CASQA Construction BMP Handbook, 2003*

**TABLE 7**

**SAMPLE COLLECTION, PRESERVATION, AND ANALYSIS FOR MONITORING NON-VISIBLE POLLUTANTS**

Keeler Dunes  
Keeler, California

Constituent	Analytical Method	Minimum Sample Volume	Sample Bottle	Sample Preservation	Reporting Limit	Maximum Holding Time
<b>Constituents for Contaminated Soil</b>						
TPH-Diesel/Motor Oil (with Silica Gel Cleanup)	EPA 8015 (EPA 3630 for Silica Gel Cleanup)	2 x 60 mL	VOA-glass	Store at 4° C	TPHD 50 µg/L - TPHMO 170 µg/L	14 days
TPH-Gasoline	EPA 8260B	3 x 40 mL	VOA-glass	Store at 4° C, HCl to pH<2	50 µg/L	14 days
VOCs	EPA 8260B	3 x 40 mL	VOA-glass	Store at 4° C, HCl to pH<2	Varies per Individual Constituent	14 days
<b>Other Constituents as needed</b>						
SVOCs	EPA 8270C	1 x 1 L	Glass-Amber	Store at 4° C	Varies per Individual Constituent	7 days
PAHs	EPA 8270C	1 x 1 L	Glass-Amber	Store at 4° C	Varies per Individual Constituent	7 days
Pesticides/PCBs	EPA 8081A/8082	1 x 1 L	Glass-Amber	Store at 4° C	Varies per Individual Constituent	7 days
Herbicides	EPA 8151A	1 x 1 L	Glass-Amber	Store at 4° C	Varies per Individual Constituent	7 days
BOD	Std. Meth. 20th Ed. 5210 B	1 x 1/2 gallon	Polypropylene	Store at 4° C	2 mg/L	48 hours
COD	HACH 8000	1 x 125 mL	Glass-Amber	Store at 4° C, H2SO4 to pH<2	5 mg/L	28 days
DO	SM 4500-O G	1 x 300mL	Glass-BOD Bottle	Store at 4° C	0.5 mg/L	Immediate
pH	Std. Meth. 20th Ed. 4500-H B	1 x 100 mL	Polypropylene	None	Unitless	Immediate
Alkalinity	SM 2320B	1 x 250 mL	Polypropylene	Store at 4° C	1 mg/L	14 days
Metals (Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, Se, Na, Th, Va, Zn)	EPA 200.8/200.7	1 x 250 mL	Polypropylene	Store at 4° C, HNO3 to pH<2	Varies per Individual Constituent	6 months
Metals (Chromium VI)	SM 3500-Cr B	1 x 250 mL	Polypropylene	Store at 4° C	5 µg/L	24 hours

Abbreviations

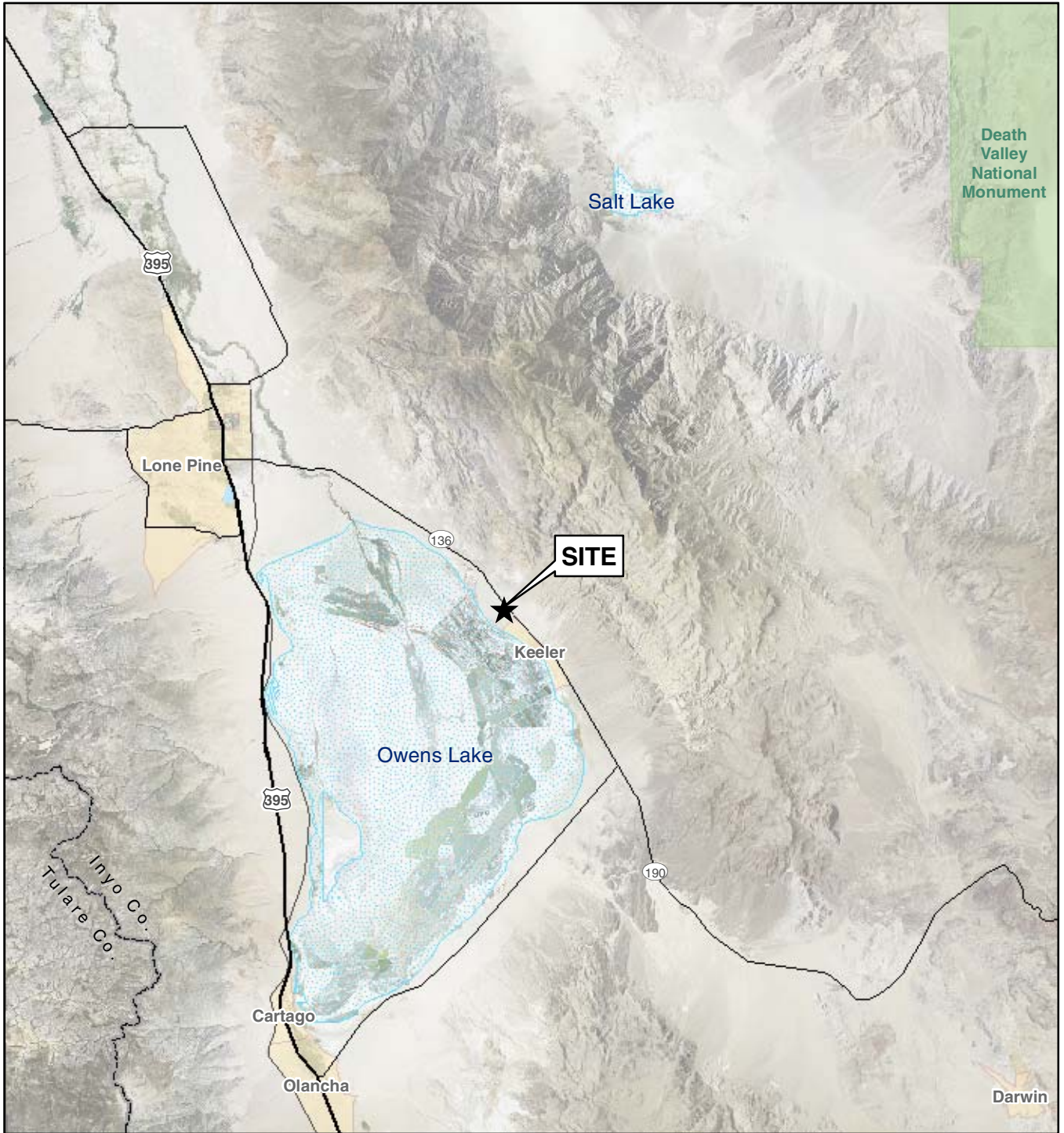
°C = Degrees Celsius  
 BOD = biochemical oxygen demand  
 COD = chemical oxygen demand  
 DO = dissolved oxygen  
 EPA = Environmental Protection Agency  
 H2SO4 = hydrogen sulfide  
 HCl = hydrochloric acid  
 HNO3 = nitric acid  
 L = liter

mg/L = milligrams per Liter  
 PAHs = polycyclic aromatic hydrocarbons  
 PCBs = polychlorinated biphenyls  
 SM = standard methods  
 SVOC = semivolatile organic compound  
 TPH = total petroleum hydrocarbon  
 µg/L = micrograms per liter  
 VOC = volatile organic compound

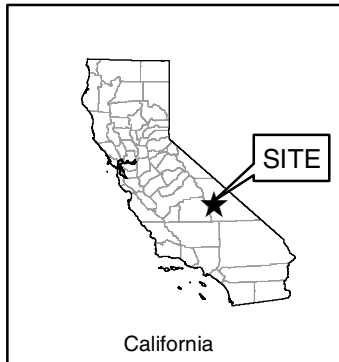
**FIGURES**

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Street map from ESRI, 2007. Aerial image from NAIP, 2012.



**SITE LOCATION MAP**  
Keeler Dunes  
Keeler, California

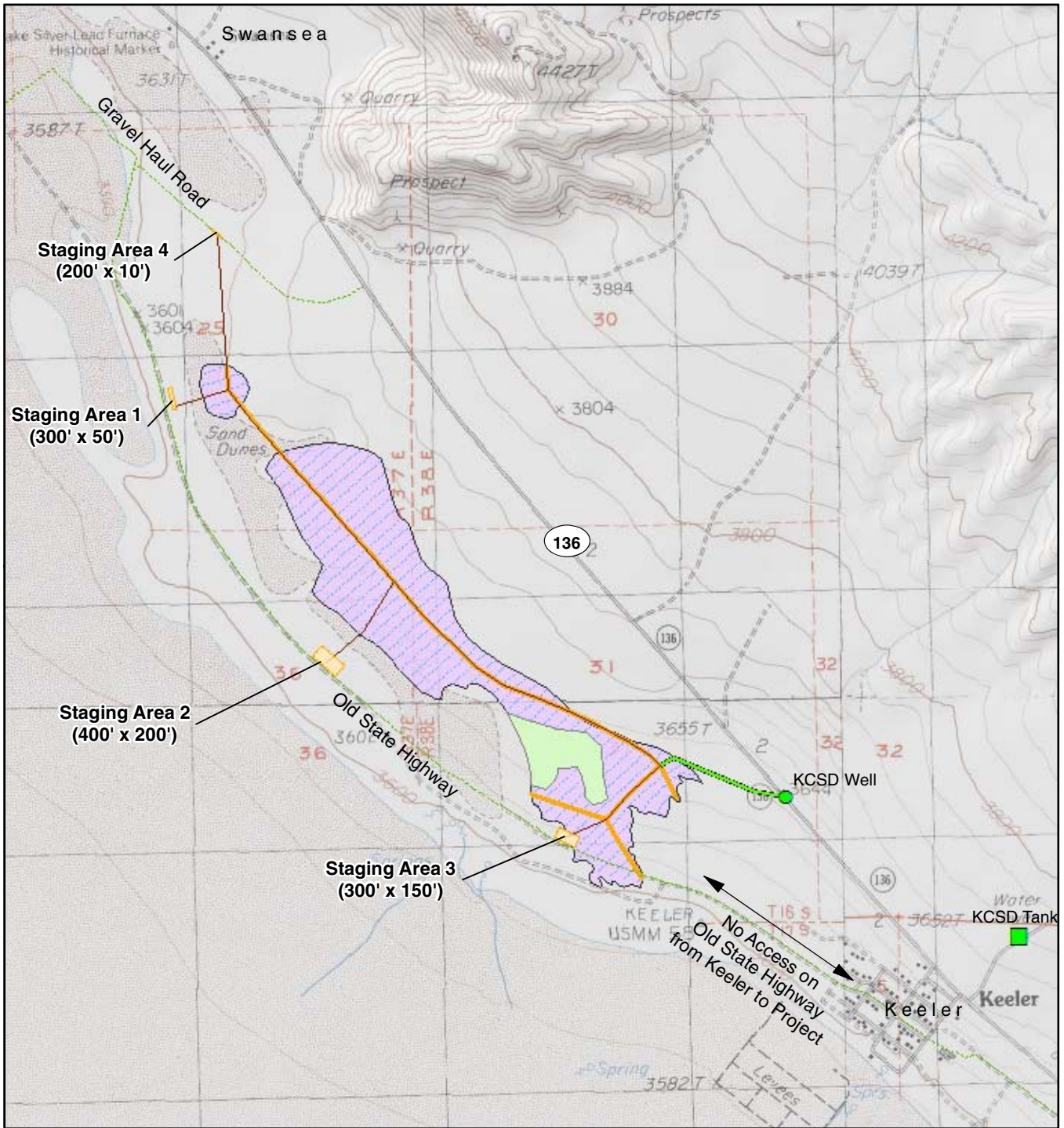
By: DMO	Date: 03/19/2014	Project No. 1355400568.0003
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Figure	<b>1</b>
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Basemap from USGS Cerro Gordo Peak, Dolomite, Keeler and Owens Lake, California 7.5' topographic quadrangles.

- Explanation**
- Project Staging Areas
  - 85% Control Level Area
  - 95% Control Level Area
  - Access routes within project area
  - Access roads to project site
  - Distribution Line
  - Trunk Line
  - Transmission Line

0 2,000 Feet



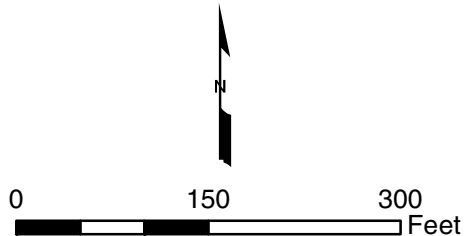
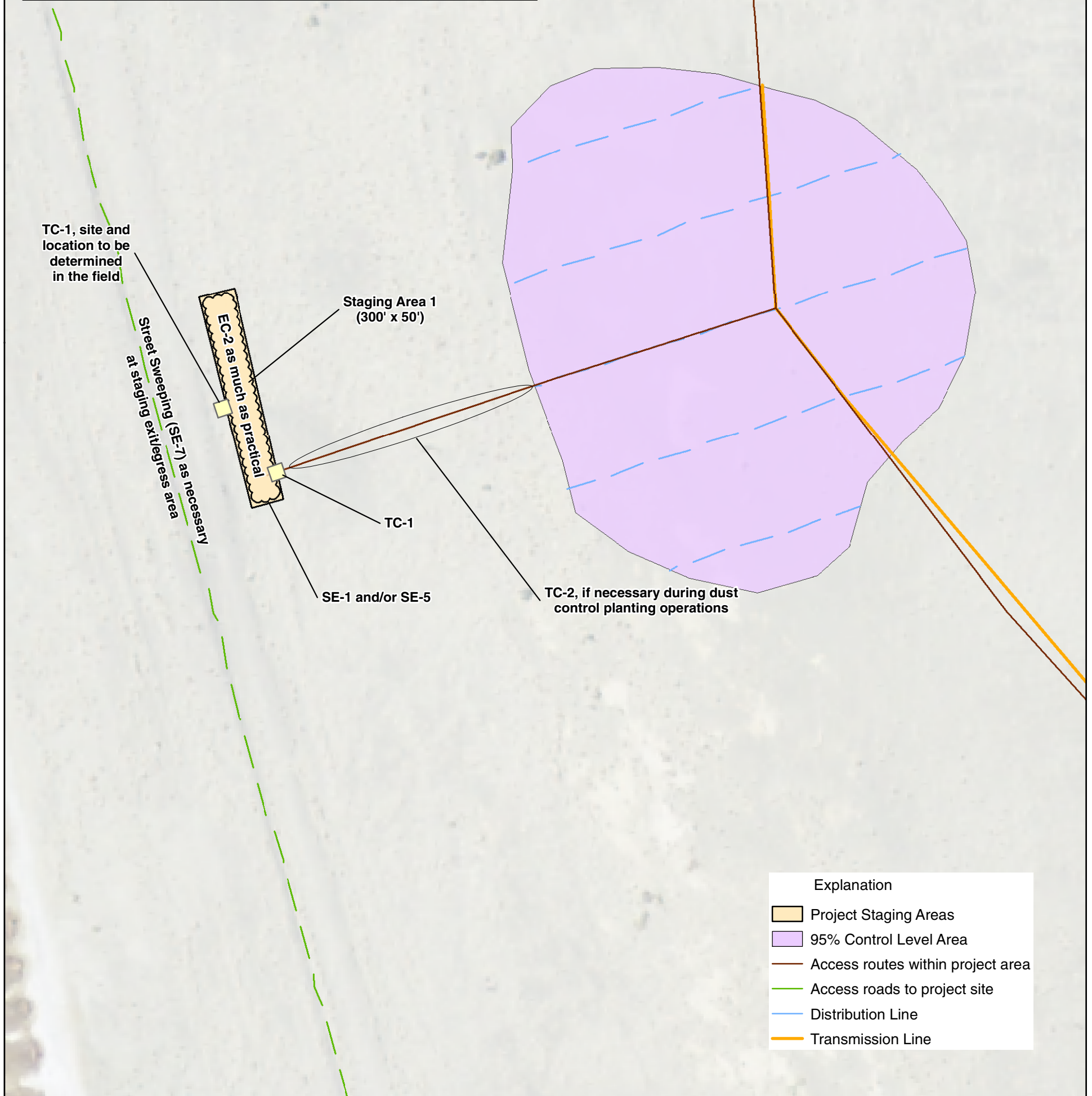
**SITE PLAN**  
Keeler Dunes  
Keeler, California

By: DMO	Date: 04/02/2014	Project No. 1355400568.0003
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Figure **2**

TABLE 1 BMP IMPLEMENTATION SCHEDULE Keeler Dunes Keeler, California			
	Best Management Practice (BMP)	Implementation	Duration
Erosion Control	EC-1, Scheduling	Prior to Construction	Entirety of Project
	EC-2, Preservation of Existing Vegetation	Start of Construction	Entirety of Project
	EC-7, Geotextile and Mats	To be Determined	To be Determined
	WE-1, Wind Erosion Control	Start of Construction	Entirety of Project
Sediment Control	SE-1, Silt Fence	Prior to Construction	Entirety of Project
	SE-5, Fiber Rolls	Start of Construction	Entirety of Project
	SE-7, Street Sweeping	Start of Construction	Entirety of Project
	TC- 1, Stabilized Construction Entrance/Exit	Start of Construction	Entirety of Project
	TC-2, Stabilized Construction Roadway	Start of Construction	Entirety of Project
Non-Storm Water	NS-1, Water Conservation Practices	Start of Construction	Entirety of Project
	NS-6, Illicit Connection - Illegal Discharge Connection	Start of Construction	Entirety of Project
	NS-8, Vehicle and Equipment Cleaning	Start of Construction	Entirety of Project
	NS-9, Vehicle and Equipment Fueling	Start of Construction	Entirety of Project
	NS-10, Vehicle and Equipment Maintenance	Start of Construction	Entirety of Project
Waste Management	WM-1, Material Delivery and Storage	Start of Construction	Entirety of Project
	WM-2, Material Use	Start of Construction	Entirety of Project
	WM-3, Stockpile Management	Start of Stockpile Construction	Entirety of Project
	WM-4, Spill Prevention and Control	Start of Construction	Entirety of Project
	WM-5, Solid Waste Management	Start of Construction	Entirety of Project
	WM-9, Sanitary-Septic Waste Management	Start of Construction	Entirety of Project

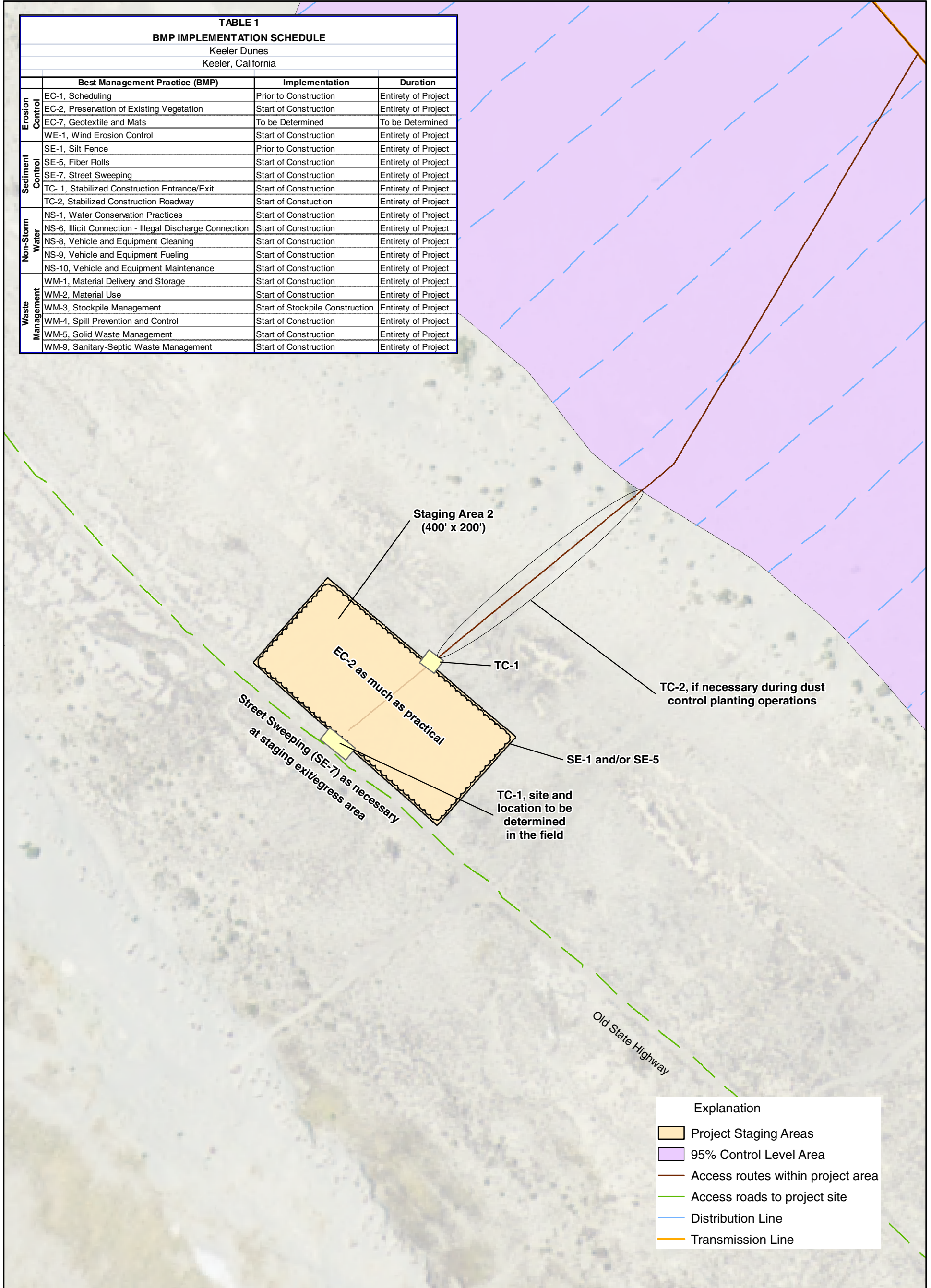


- Notes:
1. All temporary access routes and staging areas shall be restored and revegetated before end of project.
  2. Implement Table 1 BMPs for duration of project.

STAGING AREA 1 BMP IMPLEMENTATION MAP  
Keeler Dunes  
Keeler, California



TABLE 1 BMP IMPLEMENTATION SCHEDULE Keeler Dunes Keeler, California			
	Best Management Practice (BMP)	Implementation	Duration
Erosion Control	EC-1, Scheduling	Prior to Construction	Entirety of Project
	EC-2, Preservation of Existing Vegetation	Start of Construction	Entirety of Project
	EC-7, Geotextile and Mats	To be Determined	To be Determined
Sediment Control	WE-1, Wind Erosion Control	Start of Construction	Entirety of Project
	SE-1, Silt Fence	Prior to Construction	Entirety of Project
	SE-5, Fiber Rolls	Start of Construction	Entirety of Project
	SE-7, Street Sweeping	Start of Construction	Entirety of Project
Non-Storm Water	TC- 1, Stabilized Construction Entrance/Exit	Start of Construction	Entirety of Project
	TC-2, Stabilized Construction Roadway	Start of Construction	Entirety of Project
Waste Management	NS-1, Water Conservation Practices	Start of Construction	Entirety of Project
	NS-6, Illicit Connection - Illegal Discharge Connection	Start of Construction	Entirety of Project
	NS-8, Vehicle and Equipment Cleaning	Start of Construction	Entirety of Project
	NS-9, Vehicle and Equipment Fueling	Start of Construction	Entirety of Project
	NS-10, Vehicle and Equipment Maintenance	Start of Construction	Entirety of Project
	WM-1, Material Delivery and Storage	Start of Construction	Entirety of Project
Waste Management	WM-2, Material Use	Start of Construction	Entirety of Project
	WM-3, Stockpile Management	Start of Stockpile Construction	Entirety of Project
	WM-4, Spill Prevention and Control	Start of Construction	Entirety of Project
	WM-5, Solid Waste Management	Start of Construction	Entirety of Project
	WM-9, Sanitary-Septic Waste Management	Start of Construction	Entirety of Project



Notes:

1. All temporary access routes and staging areas shall be restored and revegetated before end of project.
2. Implement Table 1 BMPs for duration of project.

STAGING AREA 2 BMP IMPLEMENTATION MAP  
Keeler Dunes  
Keeler, California

By: JHH Date: 04/07/2014 Project No. 1355400568.0003



Figure

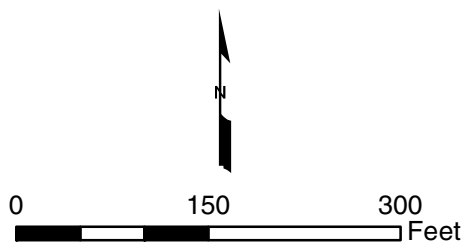
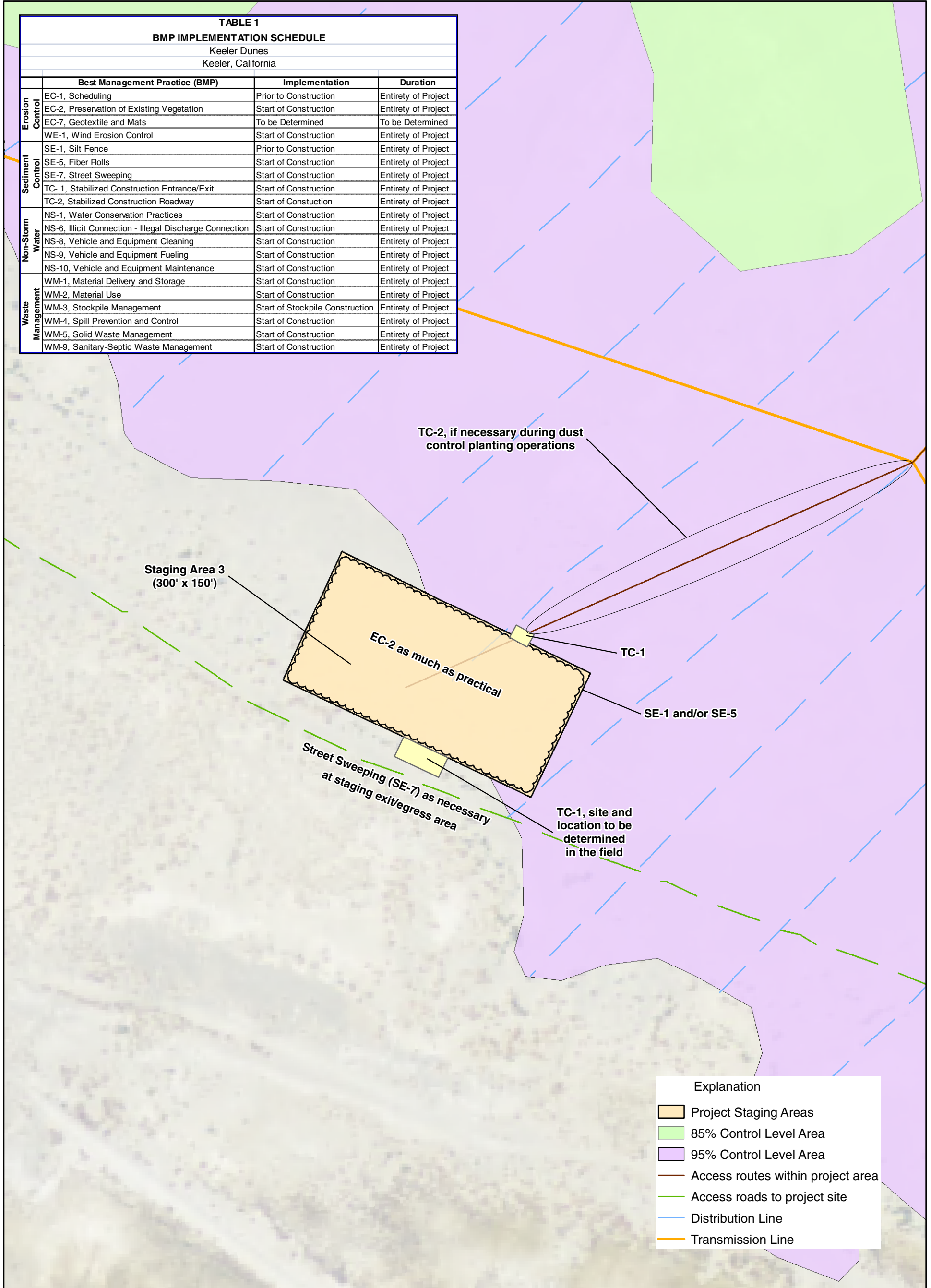
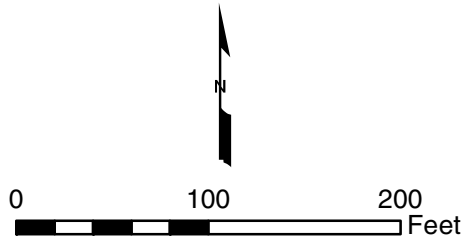


TABLE 1 BMP IMPLEMENTATION SCHEDULE Keeler Dunes Keeler, California			
	Best Management Practice (BMP)	Implementation	Duration
Erosion Control	EC-1, Scheduling	Prior to Construction	Entirety of Project
	EC-2, Preservation of Existing Vegetation	Start of Construction	Entirety of Project
	EC-7, Geotextile and Mats	To be Determined	To be Determined
Sediment Control	WE-1, Wind Erosion Control	Start of Construction	Entirety of Project
	SE-1, Silt Fence	Prior to Construction	Entirety of Project
	SE-5, Fiber Rolls	Start of Construction	Entirety of Project
	SE-7, Street Sweeping	Start of Construction	Entirety of Project
Non-Storm Water	TC- 1, Stabilized Construction Entrance/Exit	Start of Construction	Entirety of Project
	TC-2, Stabilized Construction Roadway	Start of Construction	Entirety of Project
Waste Management	NS-1, Water Conservation Practices	Start of Construction	Entirety of Project
	NS-6, Illicit Connection - Illegal Discharge Connection	Start of Construction	Entirety of Project
	NS-8, Vehicle and Equipment Cleaning	Start of Construction	Entirety of Project
	NS-9, Vehicle and Equipment Fueling	Start of Construction	Entirety of Project
	NS-10, Vehicle and Equipment Maintenance	Start of Construction	Entirety of Project
	WM-1, Material Delivery and Storage	Start of Construction	Entirety of Project
Waste Management	WM-2, Material Use	Start of Construction	Entirety of Project
	WM-3, Stockpile Management	Start of Stockpile Construction	Entirety of Project
	WM-4, Spill Prevention and Control	Start of Construction	Entirety of Project
	WM-5, Solid Waste Management	Start of Construction	Entirety of Project
	WM-9, Sanitary-Septic Waste Management	Start of Construction	Entirety of Project



Explanation	
<span style="display:inline-block; width:15px; height:10px; background-color:orange; border:1px solid black;"></span>	Project Staging Areas
<span style="display:inline-block; width:15px; height:10px; background-color:lightgreen; border:1px solid black;"></span>	85% Control Level Area
<span style="display:inline-block; width:15px; height:10px; background-color:lightpurple; border:1px solid black;"></span>	95% Control Level Area
<span style="display:inline-block; width:15px; border-bottom:1px solid brown;"></span>	Access routes within project area
<span style="display:inline-block; width:15px; border-bottom:1px dashed green;"></span>	Access roads to project site
<span style="display:inline-block; width:15px; border-bottom:1px dashed blue;"></span>	Distribution Line
<span style="display:inline-block; width:15px; border-bottom:1px solid orange;"></span>	Transmission Line



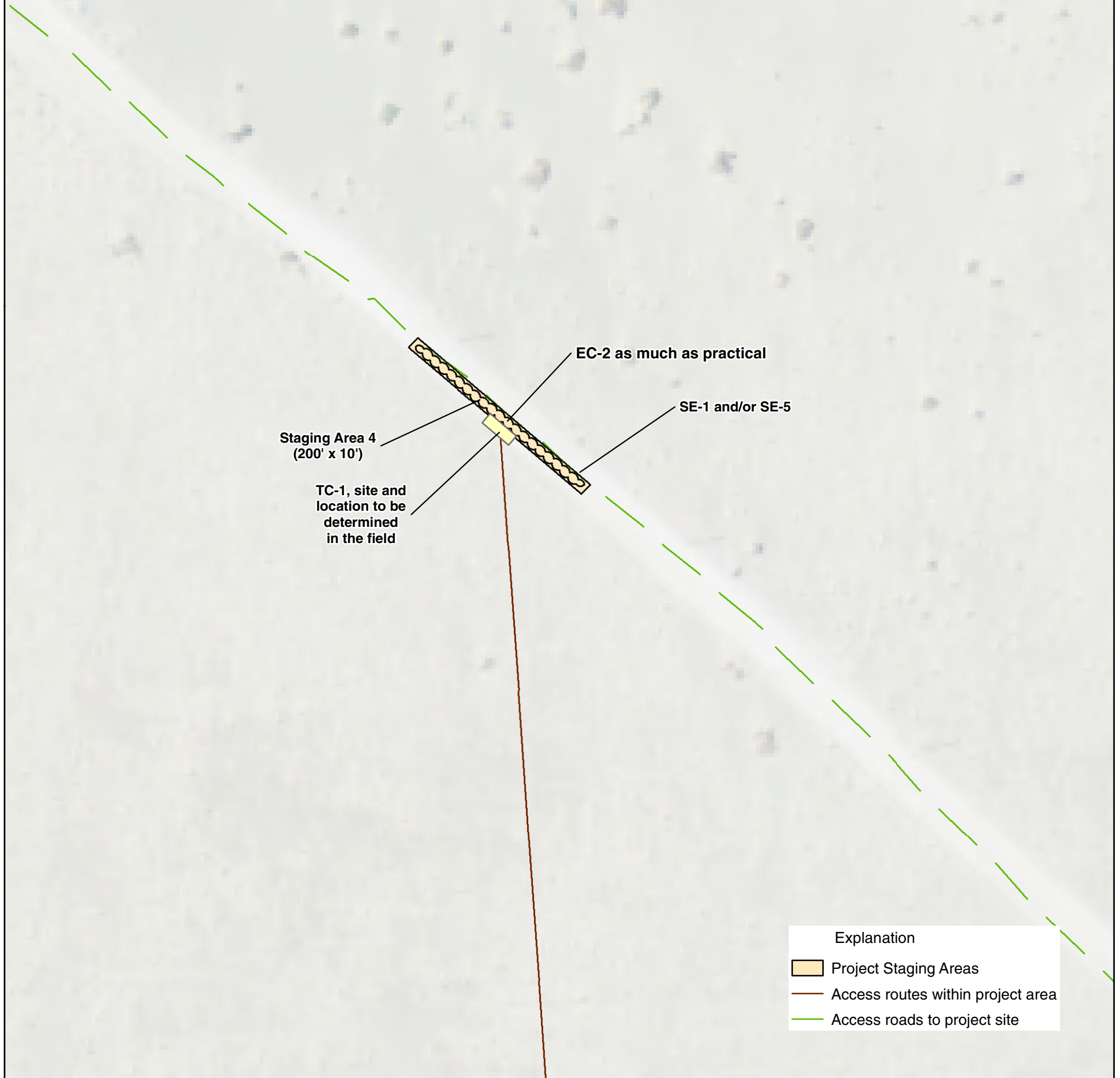
- Notes:
1. All temporary access routes and staging areas shall be restored and revegetated before end of project.
  2. Implement Table 1 BMPs for duration of project.

STAGING AREA 3 BMP IMPLEMENTATION MAP  
Keeler Dunes  
Keeler, California

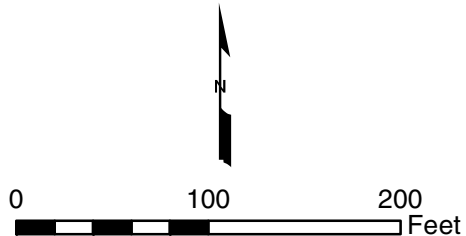
By: JHH      Date: 04/07/2014      Project No. 1355400568.0003



TABLE 1 BMP IMPLEMENTATION SCHEDULE Keeler Dunes Keeler, California			
	Best Management Practice (BMP)	Implementation	Duration
Erosion Control	EC-1, Scheduling	Prior to Construction	Entirety of Project
	EC-2, Preservation of Existing Vegetation	Start of Construction	Entirety of Project
	EC-7, Geotextile and Mats	To be Determined	To be Determined
Sediment Control	WE-1, Wind Erosion Control	Start of Construction	Entirety of Project
	SE-1, Silt Fence	Prior to Construction	Entirety of Project
	SE-5, Fiber Rolls	Start of Construction	Entirety of Project
	SE-7, Street Sweeping	Start of Construction	Entirety of Project
	TC- 1, Stabilized Construction Entrance/Exit	Start of Construction	Entirety of Project
Non-Storm Water	TC-2, Stabilized Construction Roadway	Start of Construction	Entirety of Project
	NS-1, Water Conservation Practices	Start of Construction	Entirety of Project
	NS-6, Illicit Connection - Illegal Discharge Connection	Start of Construction	Entirety of Project
	NS-8, Vehicle and Equipment Cleaning	Start of Construction	Entirety of Project
	NS-9, Vehicle and Equipment Fueling	Start of Construction	Entirety of Project
Waste Management	NS-10, Vehicle and Equipment Maintenance	Start of Construction	Entirety of Project
	WM-1, Material Delivery and Storage	Start of Construction	Entirety of Project
	WM-2, Material Use	Start of Construction	Entirety of Project
	WM-3, Stockpile Management	Start of Stockpile Construction	Entirety of Project
	WM-4, Spill Prevention and Control	Start of Construction	Entirety of Project
	WM-5, Solid Waste Management	Start of Construction	Entirety of Project
	WM-9, Sanitary-Septic Waste Management	Start of Construction	Entirety of Project



Explanation	
	Project Staging Areas
	Access routes within project area
	Access roads to project site



- Notes:
1. Apply TC-1 at junction of gravel haul road and State Highway 136. Perform street sweeping as necessary (SE-7).
  2. All temporary access routes and staging areas shall be restored and revegetated before end of project
  3. Implement Table 1 BMPs for duration of project.

STAGING AREA 4BMP IMPLEMENTATION MAP  
Keeler Dunes  
Keeler, California

By: JHH      Date: 04/07/2014      Project No. 1355400568.0003





**CSMP ATTACHMENTS**

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**ATTACHMENT 1**

Monitoring Records



**ATTACHMENT 2**

---

Weather Reports and Rain Gauge Log





**RAIN GAUGE LOG SHEET**

Construction Site Name: Keeler Dunes

WDID #:

Date (mm/dd/yy)	Time (24-hr)	Initials	Rainfall Depth (Inches)	Notes:

---

**ATTACHMENT 3**

Supplemental Information



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**APPENDIX A**

Stormwater Pollution Prevention Plan Amendment Forms



SWPPP Amendment No. \_\_\_\_\_

Project Name: Keeler Dunes

**Qualified SWPPP Developer's Certification of the  
Storm Water Pollution Prevention Plan Amendment**

"This Storm Water Pollution Prevention Plan amendment was prepared under my direction to meet the requirements of the California Construction General Permit (SWRCB Order No. 2009-009-DWQ as amended by 2010-0014-DWQ). I certify that I am a Qualified SWPPP Developer in good standing as of the date signed below."

_____ QSD's Signature Jim Honniball	_____ Date 00013
_____ QSD Name Senior Scientist, AMEC	_____ QSD Certificate Number 510-663-4108
_____ Title and Affiliation 180 Grand Avenue, Oakland, CA 94612	_____ Telephone Jim.honniball@amec.com
_____ Address	_____ Email

---

**APPENDIX B**

Stormwater Pollution Prevention Plan Certifications



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**APPENDIX C**

Notice of Non-Compliance Form



**NOTICE OF NON-COMPLIANCE**

To: Name of [City/Agency Engineer]/Regional Water Board Staff Date: Insert Date

Subject: Notice of Non-Compliance

Project Name: Keeler Dunes

Project Number/Location: Project number

In accordance with the NPDES Statewide Permit for Storm Water Discharges Associated with Construction Activity, the following instance of non-compliance (discharge violation) is noted:

**Date, time, and location of discharge**

Insert description and date of event

**Nature of the operation that caused the discharge**

insert description of operation

**Initial assessment of any impact cause by the discharge**

insert assessment

**Existing BMP(s) in place prior to discharge event**

list BMPs in place

**Date of deployment and type of BMPs deployed after the discharge.**

BMPs deployed after the discharge (with dates)

**Steps taken or planned to reduce, eliminate and/or prevent recurrence of the discharge**

insert steps taken to prevent recurrence

**Implementation and maintenance schedule for any affected BMPs**

insert implementation and maintenance schedule

If further information or a modification to the above schedule is required, notify the contact person below.

\_\_\_\_\_  
Name of Contact Person

\_\_\_\_\_  
Title

\_\_\_\_\_  
Company

\_\_\_\_\_  
Telephone Number

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date



---

**APPENDIX D**

Completed Notice of Non-Compliance Forms



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**APPENDIX E**

Dust Control Plan

## **PROJECT DESCRIPTION FOR DUST CONTROL PLAN KEELER DUNES DUST CONTROL PROJECT**

### **LOCATION AND DESCRIPTION OF WORK.**

The work to be constructed is located at the Keeler Dunes, located to the northwest of the community of Keeler in Inyo County, California (Figure 1).

The goal of the Project is to temporarily stabilize the surface of a portion of the Keeler Dunes with straw bales; and then, by planting and irrigating native shrubs associated with those bales, to create a permanently stabilized vegetated dune environment that mimics natural environments such as the existing Swansea Dunes (located to the northwest) and other stable shoreline dunes in the region (found both at Owens Lake and Mono Lake).

### **PROJECT AREA**

The Project will be implemented on 194 acres of the Keeler Dunes area. The District designed the Project to minimize environmental impacts by applying two different dust control levels at the project site (Figure 2). A dust control efficiency of 95 percent would be implemented on approximately 177 acres; and 85 percent control will be implemented on approximately 17 acres. Descriptions of each major Project component, specifically straw bales, native vegetation with wire cage protection for certain species, and an irrigation structure are presented below. Approximate numbers of plants, straw bales, and wire cages for plant protection necessary to achieve an estimated 85 and 95 percent dust control efficiency on a total of 194 acres are summarized in Table 1.

TABLE 1

PROPOSED PROJECT / PROPOSED ACTION DUST CONTROL APPLIED TO 194 ACRES

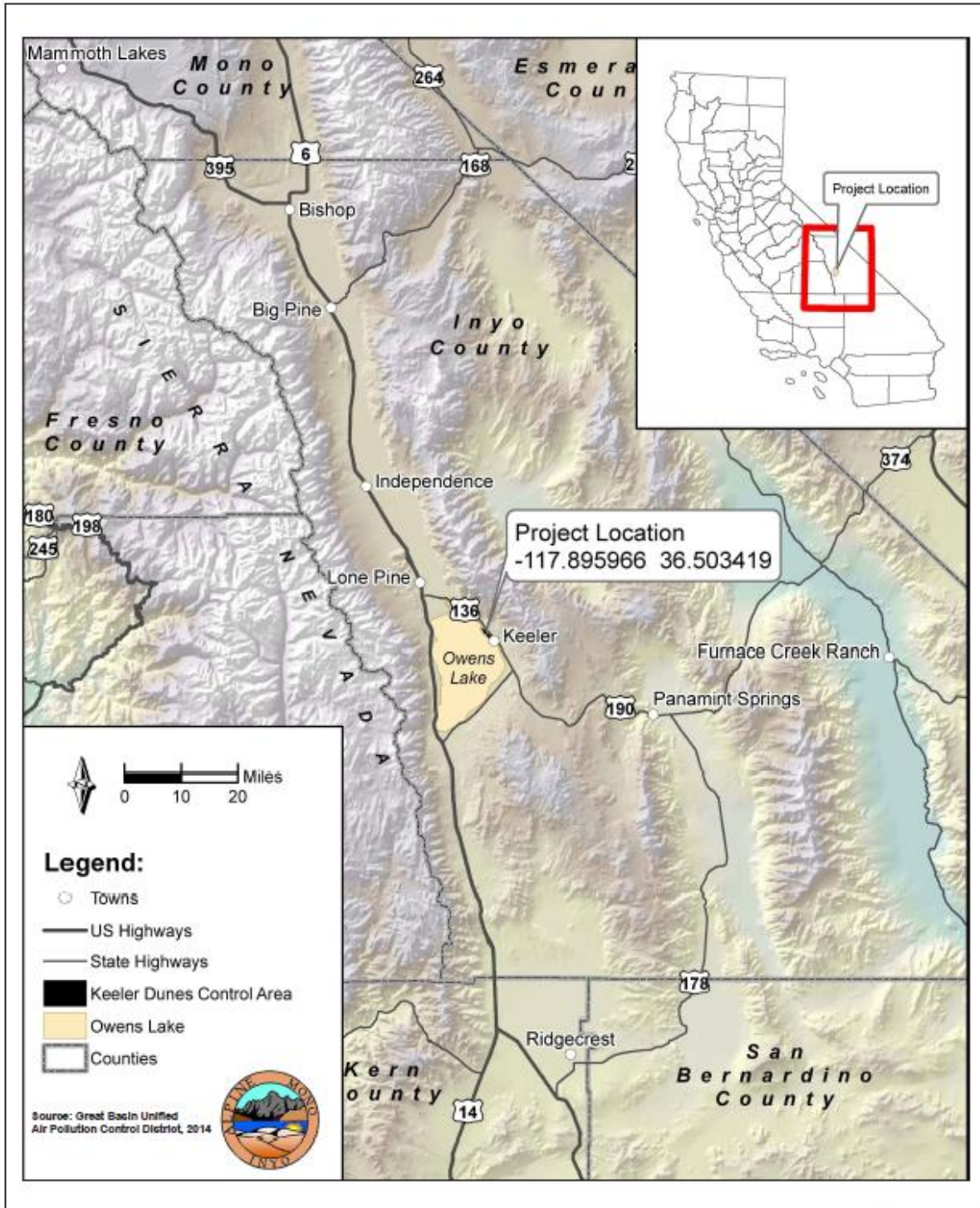
Element	Minimum Control Efficiency (%)	Number of Acres	Number Required per Acre	Total Number Required
Native plants	95	177	1,983	350,991
Native plants	85	17	1,092	18,564
<b>Total plants</b>				<b>369,555</b>
Straw bales*	95	177	661	116,997
Straw bales	85	17	364	6,188
<b>Total straw bales</b>				<b>123,185</b>
Wire cages **	95	177	661	29,246
Wire cages	85	17	364	1,551
<b>Total wire cages</b>				<b>36,900</b>

**Notes**

\* The dimensions of the straw bales are approximately 23 x 15 x 48 inches

\*\* The dimensions of the wire cages are approximately 12 x 36 inches

Figure 1. Regional Location of Project:



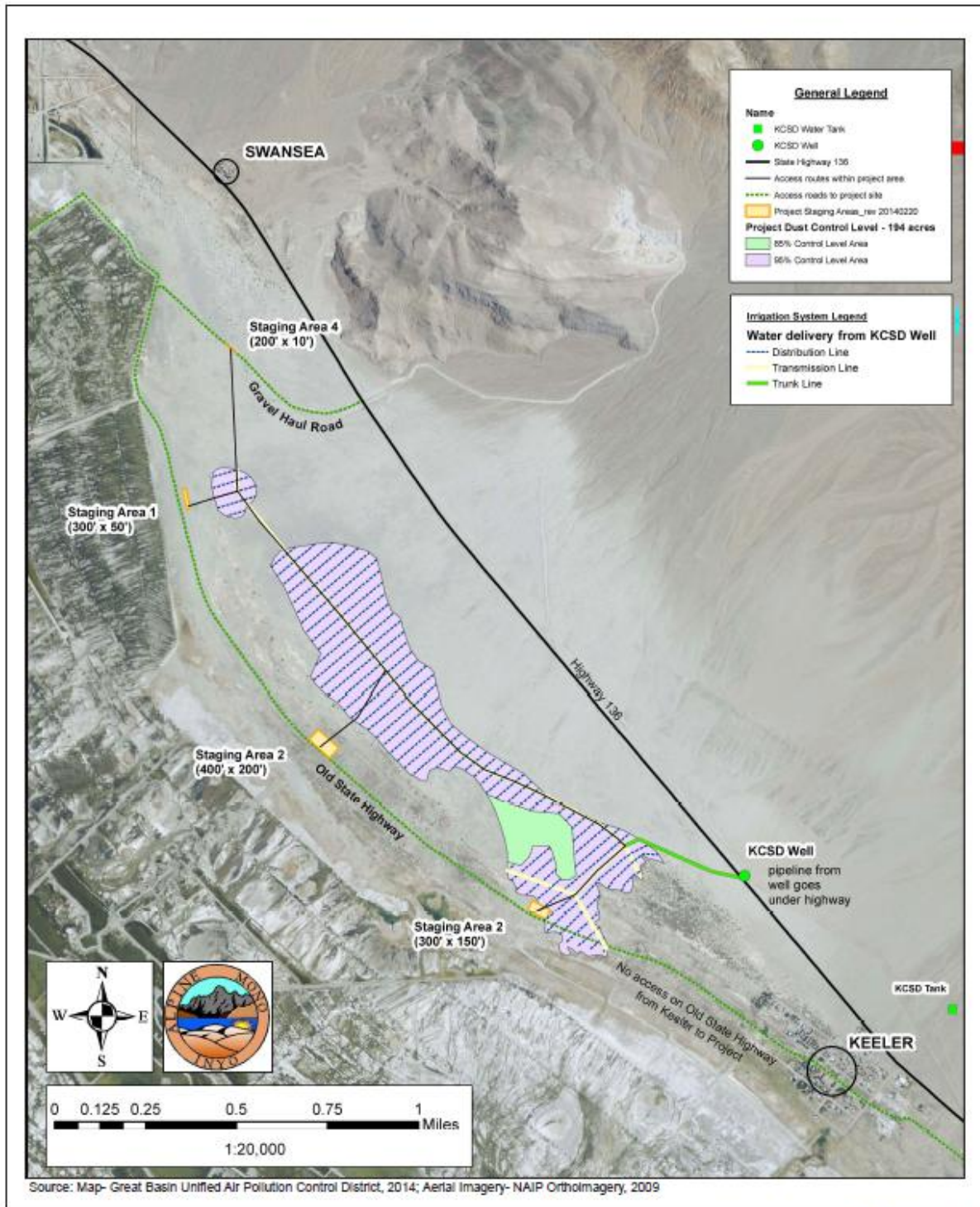
Regional Vicinity Map  
 Keeler Dunes Dust Mitigation Project  
 Great Basin Unified Air Pollution Control District

FIGURE

1



Figure 2. Project Location



Project Overview  
 Keeler Dunes Dust Mitigation Project  
 Great Basin Unified Air Pollution Control District

FIGURE

2

## PROJECT ELEMENTS

Other project elements consist of activities and infrastructure components, including

1. establishment of four temporary staging areas for equipment;
2. development of temporary access routes;
3. water supply infrastructure;
4. water storage tanks.

### 1.0 STAGING AREAS

Four temporary staging areas will be established to provide contractor(s) with storage and placement of equipment and straw bales, native plants, and supplies. The staging areas will be located on land near the project area (locations shown in Figure 2). The areas will be established by brushing the areas to be used; no grading or earthmoving is necessary or permitted. The total area of the proposed staging areas is approximately 3.3 acres. A portion of each staging area will have standard fencing installed to secure materials and equipment as deemed necessary by the Contractor.

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, the staging facility will measure 300 x 50' in area and will be used by the Contractor for the storage of equipment, fuel, all-terrain vehicles (ATVs), native plants, and other supplies. It is also anticipated that the area will serve as an employee parking lot.

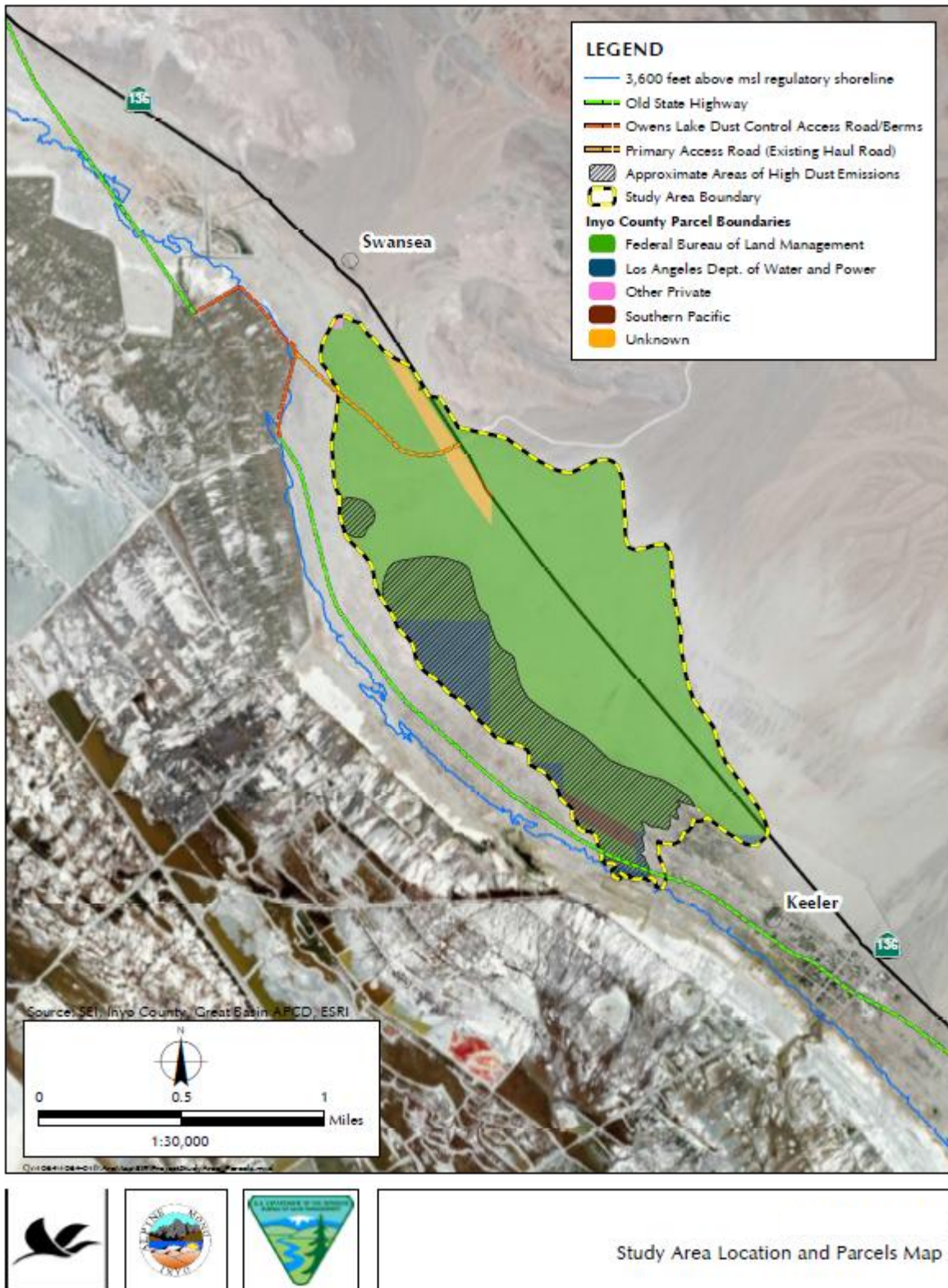
Staging Area 2 and Staging Area 3 will also be established for the Project along the Old State Highway, on land managed by LADWP and BLM respectively (Figure 3). These areas will be used for the temporary storage of equipment and materials needed for the central and southern portions of the Project area. Staging Area 2 is 200 x 400', and Staging Area 3 is 150 x 300'.

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. The area will measure approximately 10 x 300' and will be used primarily for temporary straw bale and plant storage.

The Staging Areas will require the removal of some vegetation (brushing) in order for them to function. No grading will be needed, nor is grading allowed. These Staging Areas will be restored and revegetated by the Contractor after the Project has been completed. The Storm Water Pollution Prevention Plan (SWPPP) for these areas will be prepared by the District. The contractor will be responsible for implementing the required Best Management Practices (BMPs); the District will conduct the required monitoring. The project will begin August 2014 and will be completed December 2017.



Figure 3. Land Ownership for Keeler Dunes Project



## **2.0 ACCESS ROUTES**

Designated temporary access routes 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; no conventional trucks may be used. The temporary access routes have been sited to minimize impacts to existing vegetation and avoid cultural resources. The temporary access routes will be laid out by the Contractor under supervision of District staff or consultants by laying out alignments that avoid vegetation to the maximum extent practicable. 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 for these routes. Following completion of planting and watering activities, the temporary access routes will be restored as necessary utilizing straw bales and native plants (the same method as used for the dust control areas of the Project).

The temporary access routes from all of the staging areas will total approximately 11,355 feet long (2.2 miles) by 10 feet wide following the existing grade. The approximate location of access routes is shown in Figure 2. These access routes will be the only locations where entry and egress from the project will be made. Access to individual laterals will be along the lateral lines only. Ramps will be provided over the 4 inch transmission line at the location of each lateral to allow for access to all portions of the laterals as necessary using ATVs.

## **3.0 WATER SUPPLY, CONVEYANCE, AND DISTRIBUTION**

Irrigation will be required for the plants at the time of planting, and for three years post-planting. The water for plant irrigation will be supplied from the Keeler Community Services District (KCSD) production well, located northeast of Highway 136 northwest of Keeler (Figure 2). A connection will be made at the site of the Keeler Well, and a 3 hp pump will be connected to the power line there to pressurize the irrigation system. A conduit pipe will be inserted under SH 136 using directional drilling, with equipment sites for the drilling established on a 50 x 50' disturbed area adjacent to the well, and an additional 50 x 50' site on the other side of the highway. A PVC trunk line no larger than 6 inches in diameter will be directed through the conduit and will continue on the ground surface to the southeast boundary of the project approximately 1800 feet away. This trunk line will be painted with a color deemed suitable by BLM. The drilling will take about one month; the disturbed sites will be returned to their original condition when the drilling is complete.

Delivery of water from the trunk line to the plants on the Project will be completed via a temporary above ground irrigation system installed to deliver water to the project area where watering would be necessary. The main trunk line from the well would connect to a 4 inch PVC transmission line through the dunes that would connect to 57 smaller 2 inch PVC lateral pipes. These lateral pipes would extend into the project area at a spacing of approximately 150 feet



apart, with hose attachments spaced along each pipe at approximately 150 foot intervals. Hoses conveyed to each attachment using an ATV would be used to hand-deliver water to each individual planting site. A schematic is shown in Figure 2

#### **4.0 STRAW BALES**

The Project will utilize straw bales (23 x 15 x 48 inches or similar size) installed in an irregular pattern across the project area. The bales will have been purchased by the District and will be delivered to the site by the supplier(s) at District cost. Delivery dates will be coordinated by the Contractor with the supplier(s). Placement of the bales will be done using a GIS database that will show the location of each bale required. Straw bales are anticipated to degrade over a period of several years and would provide organic material to the existing soil. The distribution of the bales is irregular, as shown in Figure 4 (District's 1.2 acre test site, on BLM land).

#### **5.0 NATIVE VEGETATION**

This component of the Project involves establishing a mix of native vegetation in association with the straw bale placement. Native vegetation to be planted includes four to five species of native desert shrubs.

Native plants will have been cultivated in nurseries and will be approximately 6 - 7 inches in height prior to planting in the project area. 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 3 native plants along the base of each straw bale, in a configuration that will include a watering access tube. Species that have been determined to be vulnerable to animal damage will be protected with a wire cage.

Schematics for planting, access tube installation, cage installation, and watering are shown in Figure 5.

#### **6.0 SCHEDULE**

Installation of the Project should require approximately 6-8 months to complete, from August 2014 through January -March 2015. Construction of the Project would be divided into the following parts:

1. development of temporary access routes and staging areas;
2. installation of irrigation system, including connection to well, installation of pump, and directional drilling to transfer water to the south side of SH 136;
3. bale placement, planting and watering;
4. project oversight and monitoring; and
5. supplemental watering and planting (project operation and maintenance) for a period of 3 years.



Supporting project activities will include plant delivery, planting, placement of straw bales, water delivery to plants and bales, ongoing monitoring, and transportation of work crews. Site preparation and construction of the Project will be undertaken in accordance with all federal, state, and County of Inyo codes and regulations.

Figure 4. Configuration of bales in test area

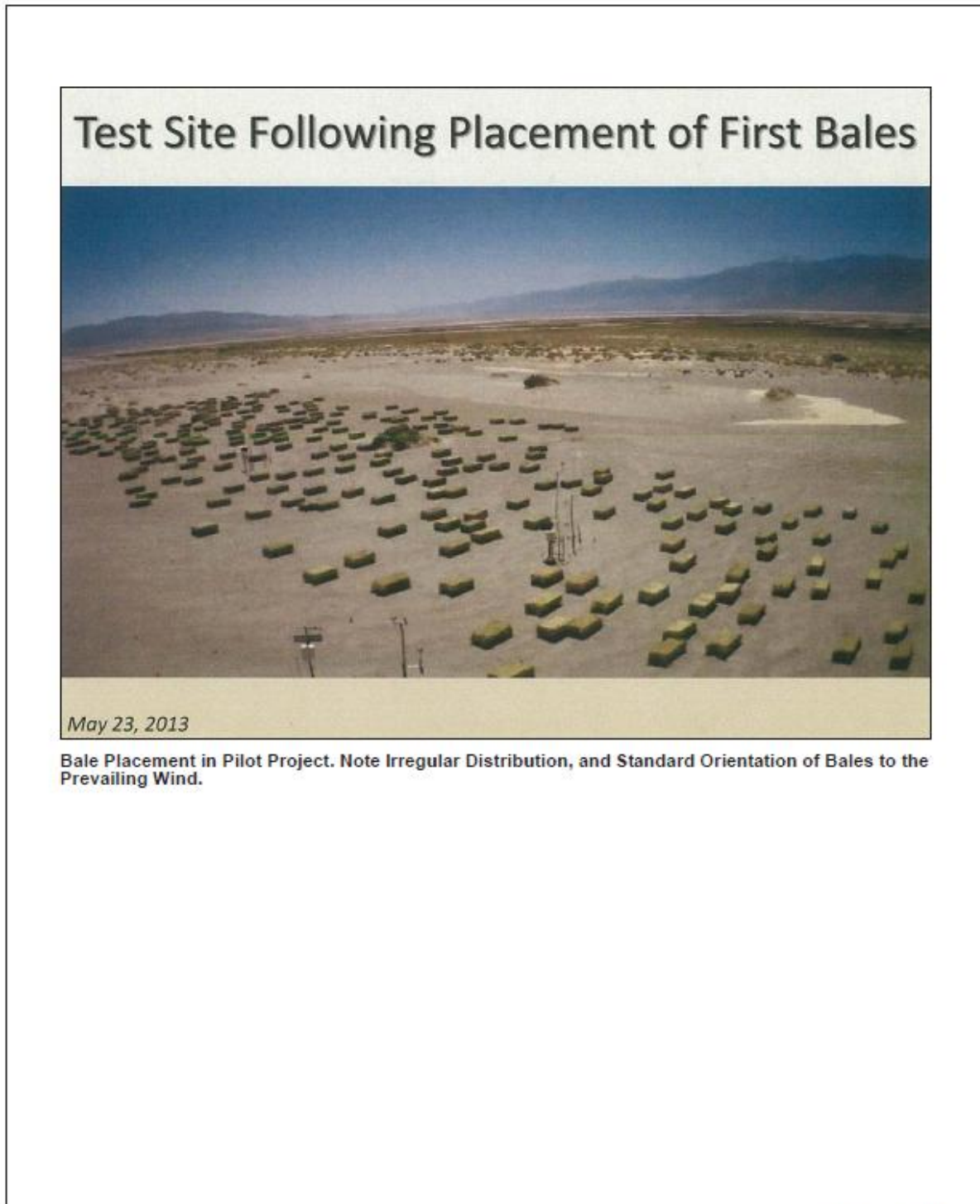
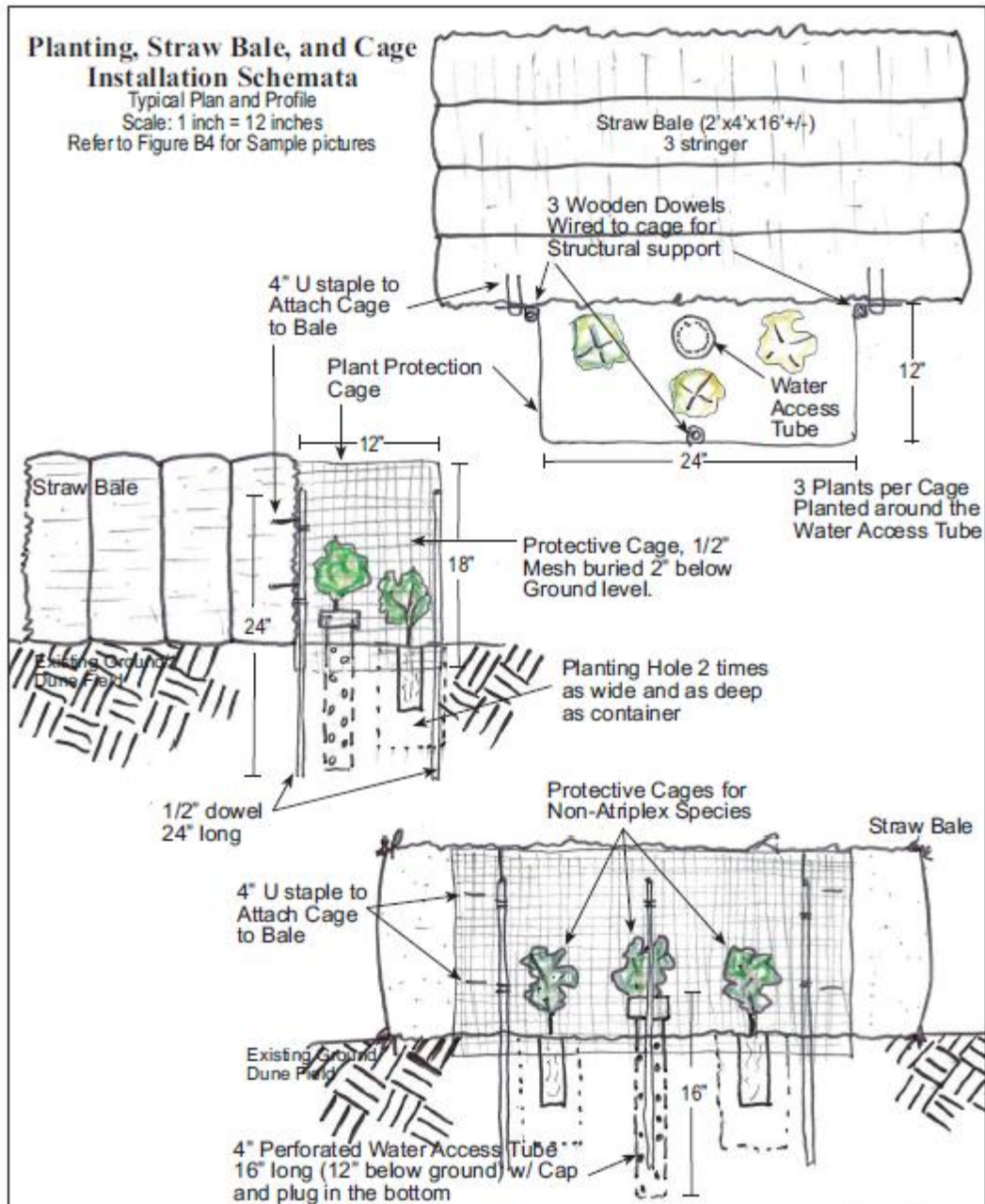


Figure 5. Installation of bales, plants, water access tube, and plant protective cage



Planting, Straw Bale, and Cage Schemata  
Keeler Dunes Dust Mitigation Project  
Great Basin Unified Air Pollution Control District

FIGURE

5

## **Access and Egress**

Site ingress and egress for construction, delivery vehicles, haul routes, and emergency response and evacuation will be from State Route 136 via the existing Gravel Haul Road and the Old State Highway (Figure 2).

Vehicular travel within the project area will be restricted to the designated access routes as much as possible. However, 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 project.

No ATV travel will be permitted in the areas shown as 85% control in Figure 2. Within this area, all material must be transported by hand along approved designated routes.

---

**APPENDIX F**

Risk Level Determination

	A	B	C
1	<b>Sediment Risk Factor Worksheet</b>		<b>Entry</b>
2	<b>A) R Factor</b>		
3	Analyses of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy (E) times the maximum 30-min intensity (I30) (Wischmeier and Smith, 1958). The numerical value of R is the average annual sum of EI30 for storm events during a rainfall record of at least 22 years. "Isoerodent" maps were developed based on R values calculated for more than 1000 locations in the Western U.S. Refer to the link below to determine the R factor for the project site.		
4	<a href="http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm">http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm</a>		
5	R Factor Value		35.51
6	<b>B) K Factor (weighted average, by area, for all site soils)</b>		
7	The soil-erodibility factor K represents: (1) susceptibility of soil or surface material to erosion, (2) transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff even though these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.65. Silt-size particles are easily detached and tend to crust, producing high rates and large volumes of runoff. Use Site-specific data must be submitted.		
8	<a href="#">Site-specific K factor guidance</a>		
9	K Factor Value		0.15
10	<b>C) LS Factor (weighted average, by area, for all slopes)</b>		
11	The effect of topography on erosion is accounted for by the LS factor, which combines the effects of a hillslope-length factor, L, and a hillslope-gradient factor, S. Generally speaking, as hillslope length and/or hillslope gradient increase, soil loss increases. As hillslope length increases, total soil loss and soil loss per unit area increase due to the progressive accumulation of runoff in the downslope direction. As the hillslope gradient increases, the velocity and erosivity of runoff increases. Use the LS table located in separate tab of this spreadsheet to determine LS factors. Estimate the weighted LS for the site prior to construction.		
12	<a href="#">LS Table</a>		
13	LS Factor Value		1.23
14			
15	Watershed Erosion Estimate (=RxKxLS) in tons/acre		6.551595
16	<b>Site Sediment Risk Factor</b>		Low
17	Low Sediment Risk: < 15 tons/acre		
18	Medium Sediment Risk: >=15 and <75 tons/acre		
19	High Sediment Risk: >= 75 tons/acre		
20			

Receiving Water (RW) Risk Factor Worksheet	Entry	Score
<b>A. Watershed Characteristics</b>	yes/no	
A.1. Does the disturbed area discharge (either directly or indirectly) to a <b>303(d)-listed waterbody impaired by sediment</b> (For help with impaired waterbodies please visit the link below) or has a <b>USEPA approved TMDL implementation plan for sediment</b> ?: <a href="http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml">http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml</a>	<b>no</b>	<b>Low</b>
<b>OR</b>		
A.2. Does the disturbed area discharge to a waterbody with designated beneficial uses of SPAWN & COLD & MIGRATORY? (For help please review the appropriate Regional Board Basin Plan) <a href="http://www.waterboards.ca.gov/waterboards_map.shtml">http://www.waterboards.ca.gov/waterboards_map.shtml</a>		
<a href="#">Region 1 Basin Plan</a> <a href="#">Region 2 Basin Plan</a> <a href="#">Region 3 Basin Plan</a> <a href="#">Region 4 Basin Plan</a> <a href="#">Region 5 Basin Plan</a> <a href="#">Region 6 Basin Plan</a> <a href="#">Region 7 Basin Plan</a> <a href="#">Region 8 Basin Plan</a> <a href="#">Region 9 Basin Plan</a>		



		Combined Risk Level Matrix		
		<u>Sediment Risk</u>		
<u>Receiving Water Risk</u>		Low	Medium	High
	Low	Level 1	Level 2	
High	Level 2		Level 3	

Project Sediment Risk: **Low**  
 Project RW Risk: **Low**  
 Project Combined Risk: **Level 1**

---

**APPENDIX G**

Construction Activities, Materials Used, and Associated Pollutants

**APPENDIX G**

**POLLUTANTS ASSOCIATED WITH CONSTRUCTION ACTIVITIES**

Keeler Dunes  
Keeler, California

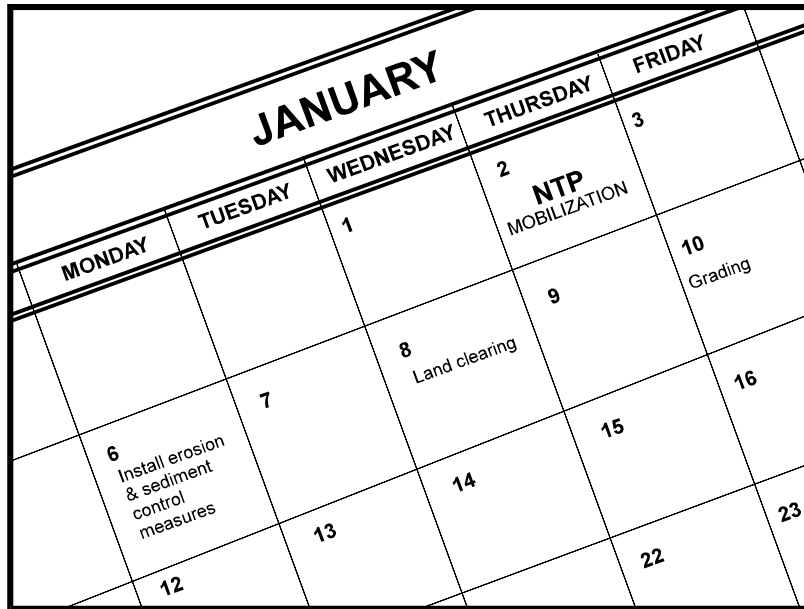
<b>General Work Activity/ Products With Potential Storm Water Pollutants</b>	<b>Specific Work Activity/Products With Potential Storm Water Pollutants</b>	<b>Pollutant Categories</b>
Moving soil for hay bale placement	<ul style="list-style-type: none"> <li>• Wind protection with placement of hay bales/revegetation</li> </ul>	Sediments, dust
Minor clear and grub	<ul style="list-style-type: none"> <li>• Vegetation removal</li> </ul>	Sediments, dust, organic matter
Sanitary waste	<ul style="list-style-type: none"> <li>• Portable toilets</li> </ul>	Nutrients
Solid waste	<ul style="list-style-type: none"> <li>• Litter, trash and debris</li> <li>• Vegetation</li> </ul>	Gross Pollutants
Vehicle and equipment use	<ul style="list-style-type: none"> <li>• Equipment operation</li> <li>• Equipment maintenance</li> <li>• Equipment washing</li> <li>• Equipment fueling</li> </ul>	Oil and Grease
Construction of soil cover	<ul style="list-style-type: none"> <li>• Stockpiling of soil, road activities</li> </ul>	Sediments, dust
Revegetation	<ul style="list-style-type: none"> <li>• Minor excavation, hauling hay bales and plants</li> <li>• Watering activities\</li> </ul>	Sediments, dust
Groundwater well supply, installation horizontal piping network to water vegetation	<ul style="list-style-type: none"> <li>• Equipment operation</li> <li>• Equipment maintenance</li> <li>• Equipment washing</li> <li>• Equipment fueling</li> </ul>	Oil and grease, sediments, dust



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**APPENDIX H**

CASQA Storm water BMP Handbook Portal: Construction Fact Sheets



## Description and Purpose

Scheduling is the development of a written plan that includes sequencing of construction activities and the implementation of BMPs such as erosion control and sediment control while taking local climate (rainfall, wind, etc.) into consideration. The purpose is to reduce the amount and duration of soil exposed to erosion by wind, rain, runoff, and vehicle tracking, and to perform the construction activities and control practices in accordance with the planned schedule.

## Suitable Applications

Proper sequencing of construction activities to reduce erosion potential should be incorporated into the schedule of every construction project especially during rainy season. Use of other, more costly yet less effective, erosion and sediment control BMPs may often be reduced through proper construction sequencing.

## Limitations

- Environmental constraints such as nesting season prohibitions reduce the full capabilities of this BMP.

## Implementation

- Avoid rainy periods. Schedule major grading operations during dry months when practical. Allow enough time before rainfall begins to stabilize the soil with vegetation or physical means or to install sediment trapping devices.
- Plan the project and develop a schedule showing each phase

## Categories

EC	Erosion Control	<input checked="" type="checkbox"/>
SE	Sediment Control	<input checked="" type="checkbox"/>
TC	Tracking Control	<input checked="" type="checkbox"/>
WE	Wind Erosion Control	<input checked="" type="checkbox"/>
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

## Legend:

- Primary Objective
- Secondary Objective

## Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

## Potential Alternatives

None



of construction. Clearly show how the rainy season relates to soil disturbing and re-stabilization activities. Incorporate the construction schedule into the SWPPP.

- Include on the schedule, details on the rainy season implementation and deployment of:
  - Erosion control BMPs
  - Sediment control BMPs
  - Tracking control BMPs
  - Wind erosion control BMPs
  - Non-stormwater BMPs
  - Waste management and materials pollution control BMPs
- Include dates for activities that may require non-stormwater discharges such as dewatering, sawcutting, grinding, drilling, boring, crushing, blasting, painting, hydro-demolition, mortar mixing, pavement cleaning, etc.
- Work out the sequencing and timetable for the start and completion of each item such as site clearing and grubbing, grading, excavation, paving, foundation pouring utilities installation, etc., to minimize the active construction area during the rainy season.
  - Sequence trenching activities so that most open portions are closed before new trenching begins.
  - Incorporate staged seeding and re-vegetation of graded slopes as work progresses.
  - Schedule establishment of permanent vegetation during appropriate planting time for specified vegetation.
- Non-active areas should be stabilized as soon as practical after the cessation of soil disturbing activities or one day prior to the onset of precipitation.
- Monitor the weather forecast for rainfall.
- When rainfall is predicted, adjust the construction schedule to allow the implementation of soil stabilization and sediment treatment controls on all disturbed areas prior to the onset of rain.
- Be prepared year round to deploy erosion control and sediment control BMPs. Erosion may be caused during dry seasons by un-seasonal rainfall, wind, and vehicle tracking. Keep the site stabilized year round, and retain and maintain rainy season sediment trapping devices in operational condition.
- Apply permanent erosion control to areas deemed substantially complete during the project's defined seeding window.

## Costs

Construction scheduling to reduce erosion may increase other construction costs due to reduced economies of scale in performing site grading. The cost effectiveness of scheduling techniques should be compared with the other less effective erosion and sedimentation controls to achieve a cost effective balance.

## Inspection and Maintenance

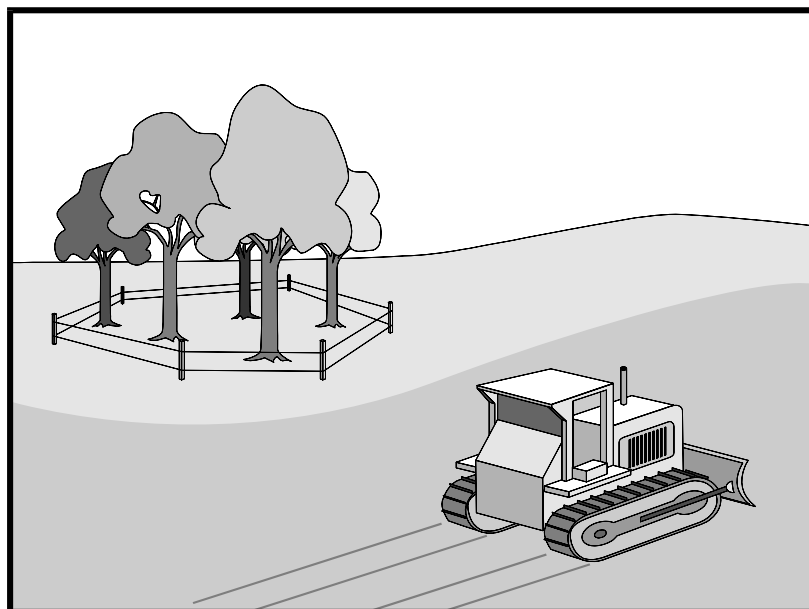
- Verify that work is progressing in accordance with the schedule. If progress deviates, take corrective actions.
- Amend the schedule when changes are warranted.
- Amend the schedule prior to the rainy season to show updated information on the deployment and implementation of construction site BMPs.

## References

Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities Developing Pollution Prevention Plans and Best Management Practices (EPA 832-R-92-005), U.S. Environmental Protection Agency, Office of Water, September 1992.

# Preservation Of Existing Vegetation EC-2



## Description and Purpose

Carefully planned preservation of existing vegetation minimizes the potential of removing or injuring existing trees, vines, shrubs, and grasses that protect soil from erosion.

## Suitable Applications

Preservation of existing vegetation is suitable for use on most projects. Large project sites often provide the greatest opportunity for use of this BMP. Suitable applications include the following:

- Areas within the site where no construction activity occurs, or occurs at a later date. This BMP is especially suitable to multi year projects where grading can be phased.
- Areas where natural vegetation exists and is designated for preservation. Such areas often include steep slopes, watercourse, and building sites in wooded areas.
- Areas where local, state, and federal government require preservation, such as vernal pools, wetlands, marshes, certain oak trees, etc. These areas are usually designated on the plans, or in the specifications, permits, or environmental documents.
- Where vegetation designated for ultimate removal can be temporarily preserved and be utilized for erosion control and sediment control.

## Limitations

- Requires forward planning by the owner/developer,

## Categories

EC	Erosion Control	<input checked="" type="checkbox"/>
SE	Sediment Control	<input type="checkbox"/>
TC	Tracking Control	<input type="checkbox"/>
WE	Wind Erosion Control	<input type="checkbox"/>
NS	Non-Stormwater Management Control	<input type="checkbox"/>
WM	Waste Management and Materials Pollution Control	<input type="checkbox"/>

## Legend:

- Primary Objective
- Secondary Objective

## Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	<input type="checkbox"/>
Trash	<input type="checkbox"/>
Metals	<input type="checkbox"/>
Bacteria	<input type="checkbox"/>
Oil and Grease	<input type="checkbox"/>
Organics	<input type="checkbox"/>

## Potential Alternatives

None





# Preservation Of Existing Vegetation EC-2

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contractor, and design staff.

- Limited opportunities for use when project plans do not incorporate existing vegetation into the site design.
- For sites with diverse topography, it is often difficult and expensive to save existing trees while grading the site satisfactory for the planned development.

## Implementation

The best way to prevent erosion is to not disturb the land. In order to reduce the impacts of new development and redevelopment, projects may be designed to avoid disturbing land in sensitive areas of the site (e.g., natural watercourses, steep slopes), and to incorporate unique or desirable existing vegetation into the site's landscaping plan. Clearly marking and leaving a buffer area around these unique areas during construction will help to preserve these areas as well as take advantage of natural erosion prevention and sediment trapping.

Existing vegetation to be preserved on the site must be protected from mechanical and other injury while the land is being developed. The purpose of protecting existing vegetation is to ensure the survival of desirable vegetation for shade, beautification, and erosion control. Mature vegetation has extensive root systems that help to hold soil in place, thus reducing erosion. In addition, vegetation helps keep soil from drying rapidly and becoming susceptible to erosion. To effectively save existing vegetation, no disturbances of any kind should be allowed within a defined area around the vegetation. For trees, no construction activity should occur within the drip line of the tree.

## *Timing*

- Provide for preservation of existing vegetation prior to the commencement of clearing and grubbing operations or other soil disturbing activities in areas where no construction activity is planned or will occur at a later date.

## *Design and Layout*

- Mark areas to be preserved with temporary fencing. Include sufficient setback to protect roots.
  - Orange colored plastic mesh fencing works well.
  - Use appropriate fence posts and adequate post spacing and depth to completely support the fence in an upright position.
- Locate temporary roadways, stockpiles, and layout areas to avoid stands of trees, shrubs, and grass.
- Consider the impact of grade changes to existing vegetation and the root zone.
- Maintain existing irrigation systems where feasible. Temporary irrigation may be required.
- Instruct employees and subcontractors to honor protective devices. Prohibit heavy equipment, vehicular traffic, or storage of construction materials within the protected area.

# Preservation Of Existing Vegetation EC-2

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## Costs

There is little cost associated with preserving existing vegetation if properly planned during the project design, and these costs may be offset by aesthetic benefits that enhance property values. During construction, the cost for preserving existing vegetation will likely be less than the cost of applying erosion and sediment controls to the disturbed area. Replacing vegetation inadvertently destroyed during construction can be extremely expensive, sometimes in excess of \$10,000 per tree.

## Inspection and Maintenance

During construction, the limits of disturbance should remain clearly marked at all times. Irrigation or maintenance of existing vegetation should be described in the landscaping plan. If damage to protected trees still occurs, maintenance guidelines described below should be followed:

- Verify that protective measures remain in place. Restore damaged protection measures immediately.
- Serious tree injuries shall be attended to by an arborist.
- Damage to the crown, trunk, or root system of a retained tree shall be repaired immediately.
- Trench as far from tree trunks as possible, usually outside of the tree drip line or canopy. Curve trenches around trees to avoid large roots or root concentrations. If roots are encountered, consider tunneling under them. When trenching or tunneling near or under trees to be retained, place tunnels at least 18 in. below the ground surface, and not below the tree center to minimize impact on the roots.
- Do not leave tree roots exposed to air. Cover exposed roots with soil as soon as possible. If soil covering is not practical, protect exposed roots with wet burlap or peat moss until the tunnel or trench is ready for backfill.
- Cleanly remove the ends of damaged roots with a smooth cut.
- Fill trenches and tunnels as soon as possible. Careful filling and tamping will eliminate air spaces in the soil, which can damage roots.
- If bark damage occurs, cut back all loosened bark into the undamaged area, with the cut tapered at the top and bottom and drainage provided at the base of the wood. Limit cutting the undamaged area as much as possible.
- Aerate soil that has been compacted over a trees root zone by punching holes 12 in. deep with an iron bar, and moving the bar back and forth until the soil is loosened. Place holes 18 in. apart throughout the area of compacted soil under the tree crown.
- Fertilization
  - Fertilize stressed or damaged broadleaf trees to aid recovery.
  - Fertilize trees in the late fall or early spring.

# **Preservation Of Existing Vegetation EC-2**

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- Apply fertilizer to the soil over the feeder roots and in accordance with label instructions, but never closer than 3 ft to the trunk. Increase the fertilized area by one-fourth of the crown area for conifers that have extended root systems.
- Retain protective measures until all other construction activity is complete to avoid damage during site cleanup and stabilization.

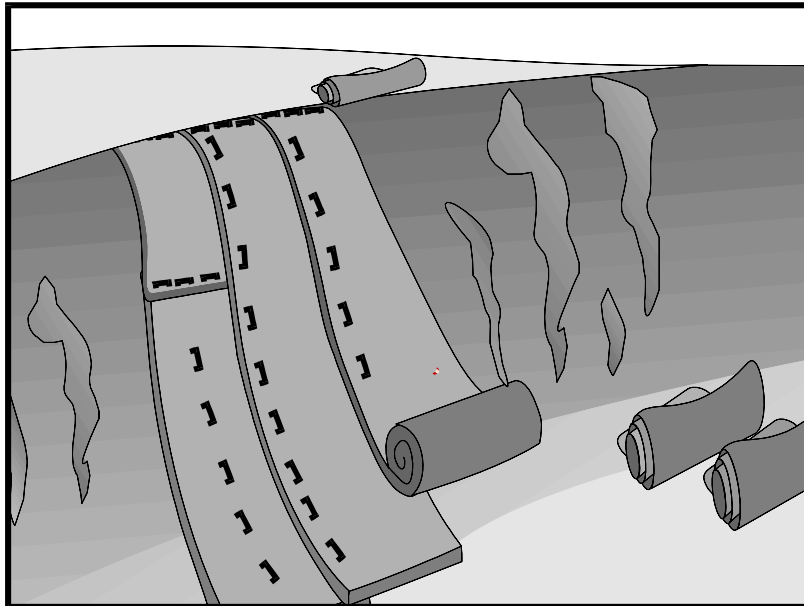
## **References**

County of Sacramento Tree Preservation Ordinance, September 1981.

Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management of the Puget Sound Basin, Technical Manual, Publication #91-75, Washington State Department of Ecology, February 1992.

Water Quality Management Plan for The Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency, November 1988.



## Description and Purpose

Mattings, or Rolled Erosion Control Products (RECPs), can be made of natural or synthetic materials or a combination of the two. RECPs are used to cover the soil surface to reduce erosion from rainfall impact, hold soil in place, and absorb and hold moisture near the soil surface. Additionally, RECPs may be used to stabilize soils until vegetation is established or to reinforce non-woody surface vegetation.

## Suitable Applications

RECPs are typically applied on slopes where erosion hazard is high and vegetation will be slow to establish. Mattings are also used on stream banks, swales and other drainage channels where moving water at velocities between 3 ft/s and 6 ft/s are likely to cause scour and wash out new vegetation, and in areas where the soil surface is disturbed and where existing vegetation has been removed. RECPs may also be used when seeding cannot occur (e.g., late season construction and/or the arrival of an early rain season). RECPs should be considered when the soils are fine grained and potentially erosive. RECPs should be considered in the following situations.

- Steep slopes, generally steeper than 3:1 (H:V)
- Slopes where the erosion potential is high
- Slopes and disturbed soils where mulch must be anchored
- Disturbed areas where plants are slow to develop

## Categories

EC	Erosion Control	<input checked="" type="checkbox"/>
SE	Sediment Control	<input type="checkbox"/>
TC	Tracking Control	<input type="checkbox"/>
WE	Wind Erosion Control	<input checked="" type="checkbox"/>
NS	Non-Stormwater Management Control	<input type="checkbox"/>
WM	Waste Management and Materials Pollution Control	<input type="checkbox"/>

## Legend:

- Primary Category
- Secondary Category

## Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	<input type="checkbox"/>
Trash	<input type="checkbox"/>
Metals	<input type="checkbox"/>
Bacteria	<input type="checkbox"/>
Oil and Grease	<input type="checkbox"/>
Organics	<input type="checkbox"/>

## Potential Alternatives

- EC-3 Hydraulic Mulch
- EC-4 Hydroseeding



- Channels with flows exceeding 3.3 ft/s
- Channels to be vegetated
- Stockpiles
- Slopes adjacent to water bodies

## Limitations

- RECP installed costs are generally higher than other erosion control BMPs, limiting their use to areas where other BMPs are ineffective (e.g. channels, steep slopes).
- RECPs may delay seed germination, due to reduction in soil temperature.
- RECPs are generally not suitable for excessively rocky sites or areas where the final vegetation will be mowed (since staples and netting can catch in mowers). If a staple or pin cannot be driven into the soil because the underlying soil is too hard or rocky, then an alternative BMP should be selected.
- If used for temporary erosion control, RECPs should be removed and disposed of prior to application of permanent soil stabilization measures.
- The use of plastic should be limited to covering stockpiles or very small graded areas for short periods of time (such as through one imminent storm event) until more environmentally friendly measures, such as seeding and mulching, may be installed.
  - Plastic sheeting is easily vandalized, easily torn, photodegradable, and must be disposed of at a landfill.
  - Plastic sheeting results in 100% runoff, which may cause serious erosion problems in the areas receiving the increased flow.
- RECPs may have limitations based on soil type, slope gradient, or channel flow rate; consult the manufacturer for proper selection.
- Not suitable for areas that have foot traffic (tripping hazard) – e.g., pad areas around buildings under construction.
- RECPs that incorporate a plastic netting (e.g. straw blanket typically uses a plastic netting to hold the straw in place) may not be suitable near known wildlife habitat. Wildlife can become trapped in the plastic netting.
- RECPs may have limitations in extremely windy climates. However, when RECPs are properly trenched at the top and bottom and stapled in accordance with the manufacturer's recommendations, problems with wind can be minimized.

## ***Implementation***

### ***Material Selection***

- Natural RECPs have been found to be effective where re-vegetation will be provided by re-seeding. The choice of material should be based on the size of area, side slopes, surface conditions such as hardness, moisture, weed growth, and availability of materials.
- Additional guidance on the comparison and selection of temporary slope stabilization methods is provided in Appendix F of the Handbook.
- The following natural and synthetic RECPs are commonly used:

### ***Geotextiles***

- Material can be a woven or a non-woven polypropylene fabric with minimum thickness of 0.06 in., minimum width of 12 ft and should have minimum tensile strength of 150 lbs (warp), 80 lbs (fill) in conformance with the requirements in ASTM Designation: D 4632. The permittivity of the fabric should be approximately  $0.07 \text{ sec}^{-1}$  in conformance with the requirements in ASTM Designation: D4491. The fabric should have an ultraviolet (UV) stability of 70 percent in conformance with the requirements in ASTM designation: D4355. Geotextile blankets must be secured in place with wire staples or sandbags and by keying into tops of slopes to prevent infiltration of surface waters under geotextile. Staples should be made of minimum 11 gauge steel wire and should be U-shaped with 8 in. legs and 2 in. crown.
- Geotextiles may be reused if they are suitable for the use intended.

### ***Plastic Covers***

- Generally plastic sheeting should only be used as stockpile covering or for very small graded areas for short periods of time (such as through one imminent storm event). If plastic sheeting must be used, choose a plastic that will withstand photo degradation.
- Plastic sheeting should have a minimum thickness of 6 mils, and must be keyed in at the top of slope (when used as a temporary slope protection) and firmly held in place with sandbags or other weights placed no more than 10 ft apart. Seams are typically taped or weighted down their entire length, and there should be at least a 12 in. to 24 in. overlap of all seams. Edges should be embedded a minimum of 6 in. in soil (when used as a temporary slope protection).
- All sheeting must be inspected periodically after installation and after significant rainstorms to check for erosion, undermining, and anchorage failure. Any failures must be repaired immediately. If washout or breakages occur, the material should be re-installed after repairing the damage to the slope.

### ***Erosion Control Blankets/Mats***

- Biodegradable RECPs are typically composed of jute fibers, curled wood fibers, straw, coconut fiber, or a combination of these materials. In order for an RECP to be considered 100% biodegradable, the netting, sewing or adhesive system that holds the biodegradable mulch fibers together must also be biodegradable. See typical installation details at the end of this fact sheet.

- **Jute** is a natural fiber that is made into a yarn that is loosely woven into a biodegradable mesh. The performance of jute as a stand-alone RECP is low. Most other RECPs outperform jute as a temporary erosion control product and therefore jute is not commonly used. It is designed to be used in conjunction with vegetation. The material is supplied in rolled strips, which should be secured to the soil with U-shaped staples or stakes in accordance with manufacturers' recommendations.
- **Excelsior** (curled wood fiber) blanket material should consist of machine produced mats of curled wood excelsior with 80 percent of the fiber 6 in. or longer. The excelsior blanket should be of consistent thickness. The wood fiber must be evenly distributed over the entire area of the blanket. The top surface of the blanket should be covered with a photodegradable extruded plastic mesh. The blanket should be smolder resistant without the use of chemical additives and should be non-toxic and non-injurious to plant and animal life. Excelsior blankets should be furnished in rolled strips, a minimum of 48 in. wide, and should have an average weight of 0.8 lb/yd<sup>2</sup>, ±10 percent, at the time of manufacture. Excelsior blankets must be secured in place with wire staples. Staples should be made of minimum 11 gauge steel wire and should be U-shaped with 8 in. legs and 2 in. crown.
- **Straw blanket** should be machine produced mats of straw with a lightweight biodegradable netting top layer. The straw should be attached to the netting with biodegradable thread or glue strips. The straw blanket should be of consistent thickness. The straw should be evenly distributed over the entire area of the blanket. Straw blanket should be furnished in rolled strips a minimum of 6.5 ft wide, a minimum of 80 ft long and a minimum of 0.5 lb/yd<sup>2</sup>. Straw blankets must be secured in place with wire staples. Staples should be made of minimum 11 gauge steel wire and should be U-shaped with 8 in. legs and 2 in. crown.
- **Wood fiber blanket** is composed of biodegradable fiber mulch with extruded plastic netting held together with adhesives. The material is designed to enhance re-vegetation. The material is furnished in rolled strips, which must be secured to the ground with U-shaped staples or stakes in accordance with manufacturers' recommendations.
- **Coconut fiber blanket** should be a machine produced mat of 100 percent coconut fiber with biodegradable netting on the top and bottom. The coconut fiber should be attached to the netting with biodegradable thread or glue strips. The coconut fiber blanket should be of consistent thickness. The coconut fiber should be evenly distributed over the entire area of the blanket. Coconut fiber blanket should be furnished in rolled strips with a minimum of 6.5 ft wide, a minimum of 80 ft. long and a minimum of 0.5 lb/yd<sup>2</sup>. Coconut fiber blankets must be secured in place with wire staples. Staples should be made of minimum 11 gauge steel wire and should be U-shaped with 8 in. legs and 2 in. crown.
- **Coconut fiber mesh** is a thin permeable membrane made from coconut or corn fiber that is spun into a yarn and woven into a biodegradable mat. It is designed to be used in conjunction with vegetation and typically has longevity of several years. The material is supplied in rolled strips, which must be secured to the soil with U-shaped staples or stakes in accordance with manufacturers' recommendations.

- **Straw coconut fiber blanket** should be machine produced mats of 70 percent straw and 30 percent coconut fiber with a biodegradable netting top layer and a biodegradable bottom net. The straw and coconut fiber should be attached to the netting with biodegradable thread or glue strips. The straw coconut fiber blanket should be of consistent thickness. The straw and coconut fiber should be evenly distributed over the entire area of the blanket. Straw coconut fiber blanket should be furnished in rolled strips a minimum of 6.5 ft wide, a minimum of 80 ft long and a minimum of 0.5 lb/yd<sup>2</sup>. Straw coconut fiber blankets must be secured in place with wire staples. Staples should be made of minimum 11 gauge steel wire and should be U-shaped with 8 in. legs and 2 in. crown.
- Non-biodegradable RECPs are typically composed of polypropylene, polyethylene, nylon or other synthetic fibers. In some cases, a combination of biodegradable and synthetic fibers is used to construct the RECP. Netting used to hold these fibers together is typically non-biodegradable as well.
  - **Plastic netting** is a lightweight biaxially oriented netting designed for securing loose mulches like straw or paper to soil surfaces to establish vegetation. The netting is photodegradable. The netting is supplied in rolled strips, which must be secured with U-shaped staples or stakes in accordance with manufacturers' recommendations.
  - **Plastic mesh** is an open weave geotextile that is composed of an extruded synthetic fiber woven into a mesh with an opening size of less than ¼ in. It is used with re-vegetation or may be used to secure loose fiber such as straw to the ground. The material is supplied in rolled strips, which must be secured to the soil with U-shaped staples or stakes in accordance with manufacturers' recommendations.
  - **Synthetic fiber with netting** is a mat that is composed of durable synthetic fibers treated to resist chemicals and ultraviolet light. The mat is a dense, three dimensional mesh of synthetic (typically polyolefin) fibers stitched between two polypropylene nets. The mats are designed to be re-vegetated and provide a permanent composite system of soil, roots, and geomatrix. The material is furnished in rolled strips, which must be secured with U-shaped staples or stakes in accordance with manufacturers' recommendations.
  - **Bonded synthetic fibers** consist of a three dimensional geomatrix nylon (or other synthetic) matting. Typically it has more than 90 percent open area, which facilitates root growth. It's tough root reinforcing system anchors vegetation and protects against hydraulic lift and shear forces created by high volume discharges. It can be installed over prepared soil, followed by seeding into the mat. Once vegetated, it becomes an invisible composite system of soil, roots, and geomatrix. The material is furnished in rolled strips that must be secured with U-shaped staples or stakes in accordance with manufacturers' recommendations.
  - **Combination synthetic and biodegradable RECPs** consist of biodegradable fibers, such as wood fiber or coconut fiber, with a heavy polypropylene net stitched to the top and a high strength continuous filament geomatrix or net stitched to the bottom. The material is designed to enhance re-vegetation. The material is furnished in rolled strips,



which must be secured with U-shaped staples or stakes in accordance with manufacturers' recommendations.

## ***Site Preparation***

- Proper soil preparation is essential to ensure complete contact of the RECP with the soil. Soil Roughening is not recommended in areas where RECPs will be installed.
- Grade and shape the area of installation.
- Remove all rocks, clods, vegetation or other obstructions so that the installed blankets or mats will have complete, direct contact with the soil.
- Prepare seedbed by loosening 2 to 3 in. of topsoil.

## ***Seeding/Planting***

Seed the area before blanket installation for erosion control and re-vegetation. Seeding after mat installation is often specified for turf reinforcement application. When seeding prior to blanket installation, all areas disturbed during blanket installation must be re-seeded. Where soil filling is specified for turf reinforcement mats (TRMs), seed the matting and the entire disturbed area after installation and prior to filling the mat with soil.

Fertilize and seed in accordance with seeding specifications or other types of landscaping plans. The protective matting can be laid over areas where grass has been planted and the seedlings have emerged. Where vines or other ground covers are to be planted, lay the protective matting first and then plant through matting according to design of planting.

## ***Check Slots***

Check slots shall be installed as required by the manufacturer.

## ***Laying and Securing Matting***

- Before laying the matting, all check slots should be installed and the seedbed should be friable, made free from clods, rocks, and roots. The surface should be compacted and finished according to the requirements of the manufacturer's recommendations.
- Mechanical or manual lay down equipment should be capable of handling full rolls of fabric and laying the fabric smoothly without wrinkles or folds. The equipment should meet the fabric manufacturer's recommendations or equivalent standards.

## ***Anchoring***

- U-shaped wire staples, metal geotextile stake pins, or triangular wooden stakes can be used to anchor mats and blankets to the ground surface.
- Wire staples should be made of minimum 11 gauge steel wire and should be U-shaped with 8 in. legs and 2 in. crown.
- Metal stake pins should be 0.188 in. diameter steel with a 1.5 in. steel washer at the head of the pin, and 8 in. in length.
- Wire staples and metal stakes should be driven flush to the soil surface.

## ***Installation on Slopes***

Installation should be in accordance with the manufacturer's recommendations. In general, these will be as follows:

- Begin at the top of the slope and anchor the blanket in a 6 in. deep by 6 in. wide trench. Backfill trench and tamp earth firmly.
- Unroll blanket down slope in the direction of water flow.
- Overlap the edges of adjacent parallel rolls 2 to 3 in. and staple every 3 ft (or greater, per manufacturer's specifications).
- When blankets must be spliced, place blankets end over end (shingle style) with 6 in. overlap. Staple through overlapped area, approximately 12 in. apart.
- Lay blankets loosely and maintain direct contact with the soil. Do not stretch.
- Staple blankets sufficiently to anchor blanket and maintain contact with the soil. Staples should be placed down the center and staggered with the staples placed along the edges. Steep slopes, 1:1 (H:V) to 2:1 (H:V), require a minimum of 2 staples/yd<sup>2</sup>. Moderate slopes, 2:1 (H:V) to 3:1 (H:V), require a minimum of 1 ½ staples/yd<sup>2</sup>. Check manufacturer's specifications to determine if a higher density staple pattern is required.

## ***Installation in Channels***

Installation should be in accordance with the manufacturer's recommendations. In general, these will be as follows:

- Dig initial anchor trench 12 in. deep and 6 in. wide across the channel at the lower end of the project area.
- Excavate intermittent check slots, 6 in. deep and 6 in. wide across the channel at 25 to 30 ft intervals along the channels.
- Cut longitudinal channel anchor trenches 4 in. deep and 4 in. wide along each side of the installation to bury edges of matting, whenever possible extend matting 2 to 3 in. above the crest of the channel side slopes.
- Beginning at the downstream end and in the center of the channel, place the initial end of the first roll in the anchor trench and secure with fastening devices at 12 in. intervals. Note: matting will initially be upside down in anchor trench.
- In the same manner, position adjacent rolls in anchor trench, overlapping the preceding roll a minimum of 3 in.
- Secure these initial ends of mats with anchors at 12 in. intervals, backfill and compact soil.
- Unroll center strip of matting upstream. Stop at next check slot or terminal anchor trench. Unroll adjacent mats upstream in similar fashion, maintaining a 3 in. overlap.

- Fold and secure all rolls of matting snugly into all transverse check slots. Lay mat in the bottom of the slot then fold back against itself. Anchor through both layers of mat at 12 in. intervals, then backfill and compact soil. Continue rolling all mat widths upstream to the next check slot or terminal anchor trench.
- Alternate method for non-critical installations: Place two rows of anchors on 6 in. centers at 25 to 30 ft. intervals in lieu of excavated check slots.
- Staple shingled lap spliced ends a minimum of 12 in. apart on 12 in. intervals.
- Place edges of outside mats in previously excavated longitudinal slots; anchor using prescribed staple pattern, backfill, and compact soil.
- Anchor, fill, and compact upstream end of mat in a 12 in. by 6 in. terminal trench.
- Secure mat to ground surface using U-shaped wire staples, geotextile pins, or wooden stakes.
- Seed and fill turf reinforcement matting with soil, if specified.

### ***Soil Filling (if specified for turf reinforcement mat (TRM))***

Installation should be in accordance with the manufacturer's recommendations. Typical installation guidelines are as follows:

- After seeding, spread and lightly rake  $\frac{1}{2}$ - $\frac{3}{4}$  inches of fine topsoil into the TRM apertures to completely fill TRM thickness. Use backside of rake or other flat implement.
- Alternatively, if allowed by product specifications, spread topsoil using lightweight loader, backhoe, or other power equipment. Avoid sharp turns with equipment.
- Always consult the manufacturer's recommendations for installation.
- Do not drive tracked or heavy equipment over mat.
- Avoid any traffic over matting if loose or wet soil conditions exist.
- Use shovels, rakes, or brooms for fine grading and touch up.
- Smooth out soil filling just exposing top netting of mat.

### ***Temporary Soil Stabilization Removal***

- Temporary soil stabilization removed from the site of the work must be disposed of if necessary.

### **Costs**

Installed costs can be relatively high compared to other BMPs. Approximate costs for installed materials are shown below:

Rolled Erosion Control Products		Installed Cost per Acre (2000) <sup>1</sup>	Estimated Cost per Acre (2009) <sup>2</sup>
Biodegradable	Jute Mesh	\$6,000-\$7,000	\$6,600-\$7,700
	Curled Wood Fiber	\$8,000-\$10,500	\$8,800-\$11,050
	Straw	\$8,000-\$10,500	\$8,800-\$11,050
	Wood Fiber	\$8,000-\$10,500	\$8,800-\$11,050
	Coconut Fiber	\$13,000-\$14,000	\$14,300-\$15,400
	Coconut Fiber Mesh	\$30,000-\$33,000	\$33,000-\$36,300
	Straw Coconut Fiber	\$10,000-\$12,000	\$11,000-\$13,200
Non-Biodegradable	Plastic Netting	\$2,000-\$2,200	\$2,200-\$2,220
	Plastic Mesh	\$3,000-\$3,500	\$3,300-\$3,850
	Synthetic Fiber with Netting	\$34,000-\$40,000	\$37,400-\$44,000
	Bonded Synthetic Fibers	\$45,000-\$55,000	\$49,500-\$60,500
	Combination with Biodegradable	\$30,000-\$36,000	\$33,000-\$39,600

1. Source: Erosion Control Pilot Study Report, Caltrans, June 2000.

2. 2009 costs reflect a 10% escalation over year 2000 costs. Escalation based on informal survey of industry trends. Note: Expected cost increase is offset by competitive economic conditions.

## ***Inspection and Maintenance***

- RECPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Areas where erosion is evident shall be repaired and BMPs reapplied as soon as possible. Care should be exercised to minimize the damage to protected areas while making repairs, as any area damaged will require reapplication of BMPs.
- If washout or breakage occurs, re-install the material after repairing the damage to the slope or channel.
- Make sure matting is uniformly in contact with the soil.
- Check that all the lap joints are secure.
- Check that staples are flush with the ground.

## **References**

Erosion and Sediment Control Manual, Oregon Department of Environmental Quality, February 2005

Erosion Control Pilot Study Report, State of California Department of Transportation (Caltrans), June 2000.

Guides for Erosion and Sediment Controls in California, USDA Soils Conservation Service, January 1991.

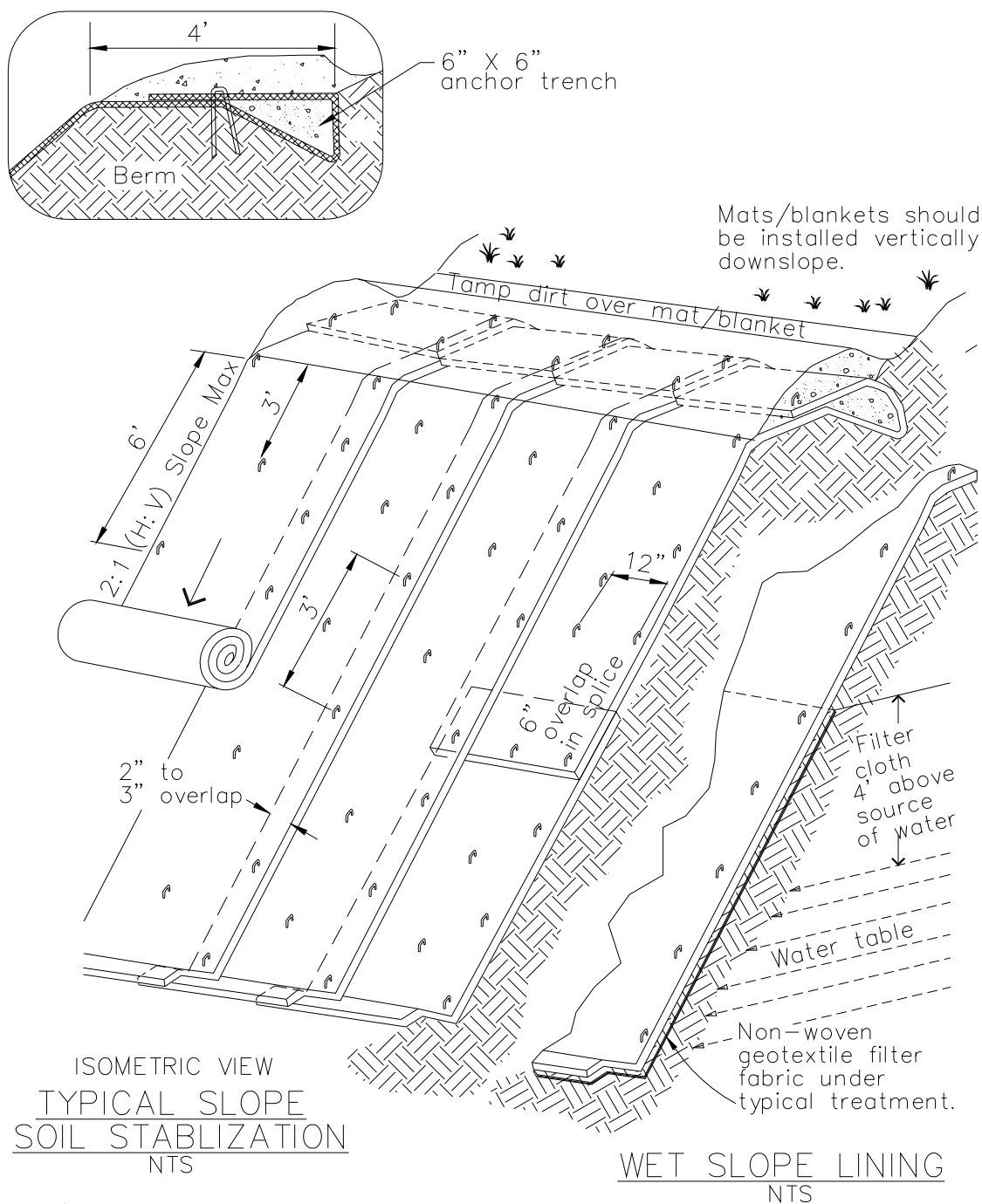
National Management Measures to Control Nonpoint Source Pollution from Urban Areas, United States Environmental Protection Agency, 2002.

Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.

Guidance Document: Soil Stabilization for Temporary Slopes, State of California Department of Transportation (Caltrans), November 1999.

Stormwater Management of the Puget Sound Basin, Technical Manual, Publication #91-75, Washington State Department of Ecology, February 1992.

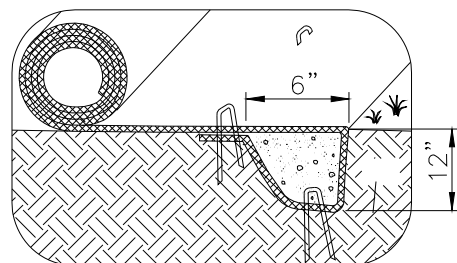
Water Quality Management Plan for The Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency, November 1988.



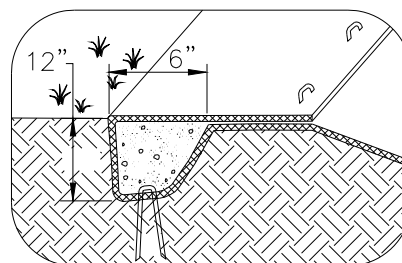
NOTES:

1. Slope surface shall be free of rocks, clods, sticks and grass. Mats/blankets shall have good soil contact.
2. Lay blankets loosely and stake or staple to maintain direct contact with the soil. Do not stretch.
3. Install per manufacturer's recommendations

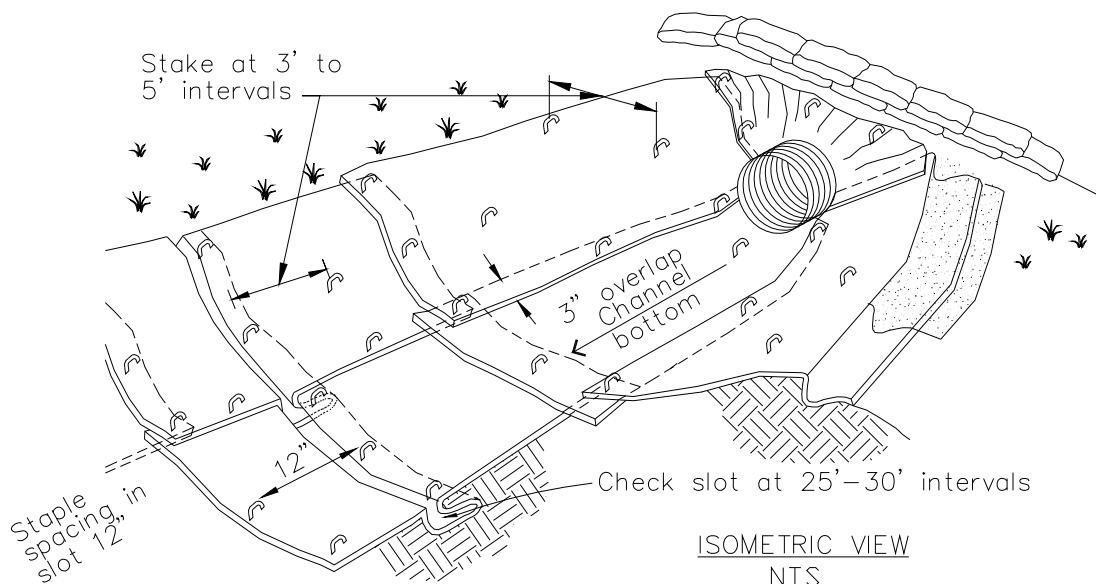
TYPICAL INSTALLATION DETAIL



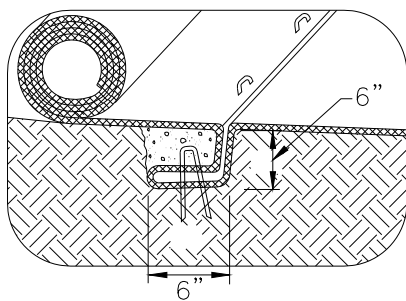
INITIAL CHANNEL ANCHOR TRENCH  
NTS



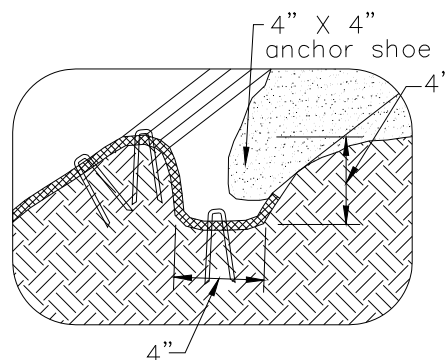
TERMINAL SLOPE AND CHANNEL  
ANCHOR TRENCH  
NTS



ISOMETRIC VIEW  
NTS



INTERMITTENT CHECK SLOT  
NTS



LONGITUDINAL ANCHOR TRENCH  
NTS

NOTES:

1. Check slots to be constructed per manufacturers specifications.
2. Staking or stapling layout per manufacturers specifications.
3. Install per manufacturer's recommendations

## TYPICAL INSTALLATION DETAIL



## Description and Purpose

Non-vegetative stabilization methods are used for temporary or permanent stabilization of areas prone to erosion and should be used only where vegetative options are not feasible; examples include:

- Areas of vehicular or pedestrian traffic such as roads or paths;
- Arid environments where vegetation would not provide timely ground coverage, or would require excessive irrigation;
- Rocky substrate, infertile or droughty soils where vegetation would be difficult to establish; and
- Areas where vegetation will not grow adequately within the construction time frame.

There are several non-vegetative stabilization methods and selection should be based on site-specific conditions.

**Decomposed Granite (DG)** is a permanent erosion protection method that consists of a layer of stabilized decomposed granite placed over an erodible surface.

**Degradable Mulches** of various types (see EC-3, EC-6, EC-8) can be used for temporary non-vegetative stabilization; examples include straw mulch, compost, wood chips or hydraulic mulch.

**Geotextiles and Mats** can be used for temporary non-vegetative stabilization (see EC-7). These BMPs are typically manufactured

## Categories

EC	Erosion Control	<input checked="" type="checkbox"/>
SE	Sediment Control	<input checked="" type="checkbox"/>
TR	Tracking Control	
WE	Wind Erosion Control	<input checked="" type="checkbox"/>
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

## Legend:

- Primary Category
- Secondary Category

## Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

## Potential Alternatives

None





from degradable or synthetic materials and are designed and specified based on their functional longevity, i.e., how long they will persist and provide erosion protection. All geotextiles and mats should be replaced when they exceed their functional longevity or when permanent stabilization methods are instituted.

**Gravel Mulch** is a non-degradable erosion control product that is composed of washed and screened coarse to very coarse gravel, 16 mm to 64 mm (0.6" - 2.5"), similar to an AASHTO No. 3 coarse aggregate.

**Rock Slope Protection** consists of utilizing large rock or rip-rap (4" - 24") to stabilize slopes with a high erosion potential and those subject to scour along waterways.

**Soil Binders** can be used for temporary non-vegetative stabilization (see EC-5). The key to their use is functional longevity. In most cases, the soil binder will need to be routinely monitored and re-applied to maintain an erosion-resistant coverage.

## Suitable Applications

Non-vegetated stabilization methods are suitable for use on disturbed soil areas and on material stockpiles that need to be temporarily or permanently protected from erosion by water and wind. Non-vegetated stabilization should only be utilized when vegetation cannot be established in the required timeframe, due to soil or climactic conditions, or where vegetation may be a potential fire hazard.

**Decomposed Granite (DG) and Gravel Mulch** are suitable for use in areas where vegetation establishment is difficult, on flat surfaces, trails and pathways, and when used in conjunction with a stabilizer or tackifier, on shallow slopes (i.e., 10:1 [H:V]). DG and gravel can also be used on shallow rocky slopes where vegetation cannot be established for permanent erosion control.

**Degradable Mulches** can be used to cover and protect soil surfaces from erosion both in temporary and permanent applications. In many cases, the use of mulches by themselves requires routine inspection and re-application. See EC-3 Hydraulic Mulch, EC-6 Straw Mulch, EC-8 Wood Mulch, or EC-14 Compost Blankets for more information.

**Geotextiles and Mats** can be used as a temporary stand-alone soil stabilization method. Depending on material selection, geotextiles and mats can be a short-term (3 mos – 1 year) or long-term (1-2 years) temporary stabilization method. For more information on geotextiles and mats see EC-7 Geotextiles and Mats.

**Rock Slope Protection** can be used when the slopes are subject to scour or have a high erosion potential, such as slopes adjacent to flowing waterways or slopes subject to overflow from detention facilities (spillways).

**Soil Binders** can be used for temporary stabilization of stockpiles and disturbed areas not subject to heavy traffic. See EC-5 Soil Binders for more information.

## Limitations

### **General**

- Refer to EC-3, EC-6, EC-8, and EC-14 for limitations on use of mulches. Refer to EC-7 for limitations on use of geotextiles and mats. Refer to EC-5 for limitations on use of Soil Binders.

### **Decomposed Granite**

- Not available in some geographic regions.
- If not tackified, material may be susceptible to erosion even on slight slopes (e.g., 30:1 [H:V]).
- Installed costs may be more expensive than vegetative stabilization methods.

### **Gravel Mulch**

- Availability is limited in some geographic regions.
- If not properly screened and washed, can contain fine material that can erode and/or create dust problems.
- If inadequately sized, material may be susceptible to erosion on sloped areas.
- Pore spaces fill with dirt and debris over time; may provide a growing medium for weeds.

### **Rock Slope Protection**

- Installation is labor intensive.
- Installed costs can be significantly higher than vegetative stabilization methods.
- Rounded stones may not be used on slopes greater than 2:1 [H:V].

## Implementation

### **General**

Non-vegetated stabilization should be used in accordance with the following general guidance:

- Should be used in conjunction with other BMPs, including drainage, erosion controls and sediment controls.
- Refer to EC-3, EC-6, EC-8, and EC-14 for implementation details for mulches. Refer to EC-7 for implementation details for geotextiles and mats. Refer to EC-5 for implementation details for soil binders.
- Non-vegetated stabilization measures should be implemented as soon as the disturbance in the areas they are intended to protect has ceased.
- Additional guidance on the comparison and selection of temporary slope stabilization methods is provided in Appendix F of the Handbook.

### **Decomposed Granite Stabilization**

- If used for a road or path should be installed on a prepared base.

- Should be mixed with a stabilizer if used for roads or pathways, or on slope applications.
- Though porous it is recommended to prevent standing water on or next to a decomposed granite road or pathway.

## ***Gravel Mulch***

- Should be sized based on slope, rainfall, and upgradient run-on conditions. Stone size should be increased as potential for erosion increases (steeper slopes, high intensity rainfall).
- If permanent, a weed control fabric should be placed prior to installation.
- Should be installed at a minimum 2" depth.
- Should completely cover all exposed surfaces.

## ***Rock Slope Protection***

- Rock slope protection installation should follow Caltrans Standard Specification 72-2: Rock Slope Protection. Refer to the specification for rock conformity requirements and installation methods.
- When using rock slope protection, rock size and installation method should be specified by an Engineer.
- A geotextile fabric should be placed prior to installation.

## **Costs**

- Costs are highly variable depending not only on technique chosen, but also on materials chosen within specific techniques. In addition, availability of certain materials will vary by region/location, which will also affect the cost. Costs of mulches, geotextiles and mats, and soil binders are presented in their respective fact sheets. Costs for decomposed granite, gravel mulch stabilization and rock slope protection may be higher depending on location and availability of materials. Caltrans has provided an estimate for gravel mulch of \$10 - \$15/yd<sup>2</sup> in flat areas and \$11 - \$23/yd<sup>2</sup> on side slopes.

## **Inspection and Maintenance**

### ***General***

- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- For permanent installation, require inspection periodically and after major storm events to look for signs of erosion or damage to the stabilization.
- All damage should be repaired immediately.
- Refer to EC-3, EC-6, EC-8, and EC-14 for inspection and maintenance requirements for mulches. Refer to EC-7 for inspection and maintenance requirements for geotextiles and mats. Refer to EC-5 for inspection and maintenance requirements for soil binders.

## ***Decomposed Granite and Gravel Mulch Stabilization***

- Rake out and add decomposed granite or gravel as needed to areas subject to rill erosion. Inspect upgradient drainage controls and repair/modify as necessary.
- Should remain stable under loose surface material. Any significant problem areas should be repaired to restore uniformity to the installation.

## **References**

Arid Zone Forestry: A Guide for Field Technicians. Food and Agriculture Organization of the United Nations, 1989.

Design of Roadside Channels with Flexible Linings, Hydraulic Engineering Circular Number 15, Third Edition, Federal Highway Administration, 2007.

Design Standards for Urban Infrastructure - Soft Landscape Design, Department of Territory and Municipal Services - Australian Capital Territory [http://www.tams.act.gov.au/work/standards\\_and\\_procedures/design\\_standards\\_for\\_urban\\_infrastructure](http://www.tams.act.gov.au/work/standards_and_procedures/design_standards_for_urban_infrastructure)

Erosion and Sediment Control Handbook: A Guide for Protection of State Waters through the use of Best Management Practices during Land Disturbing Activities, Tennessee Department of Environment and Conservation, 2002.

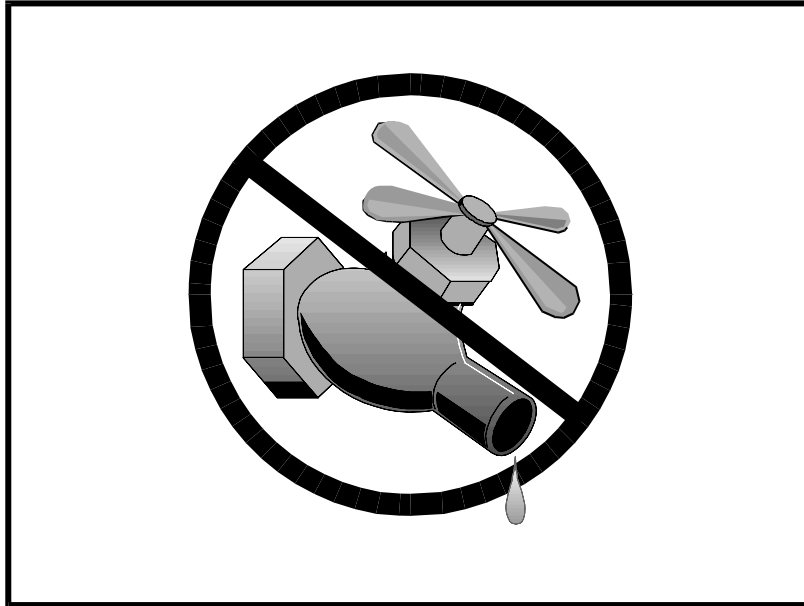
Gravel Mulch, Landscape Architecture Non-Standard Specification 10-2, California Department of Transportation (Caltrans), <http://www.dot.ca.gov/hq/LandArch/roadside/detail-gm.htm>

Maine Erosion and Sediment Control BMPs, DEPLW0588, Maine Department of Environmental Protection: Bureau of Land and Water Quality, 2003.

National Menu of Best Management Practices, US Environmental Protection Agency, 2006.

Standard Specification 72-2: Rock Slope Protection. California Department of Transportation, 2006.

Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.



## Description and Purpose

Water conservation practices are activities that use water during the construction of a project in a manner that avoids causing erosion and the transport of pollutants offsite. These practices can reduce or eliminate non-stormwater discharges.

## Suitable Applications

Water conservation practices are suitable for all construction sites where water is used, including piped water, metered water, trucked water, and water from a reservoir.

## Limitations

- None identified.

## Implementation

- Keep water equipment in good working condition.
- Stabilize water truck filling area.
- Repair water leaks promptly.
- Washing of vehicles and equipment on the construction site is discouraged.
- Avoid using water to clean construction areas. If water must be used for cleaning or surface preparation, surface should be swept and vacuumed first to remove dirt. This will minimize amount of water required.
- Direct construction water runoff to areas where it can soak

## Categories

EC	Erosion Control	<input checked="" type="checkbox"/>
SE	Sediment Control	<input checked="" type="checkbox"/>
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	<input checked="" type="checkbox"/>
WM	Waste Management and Materials Pollution Control	

## Legend:

- Primary Objective
- Secondary Objective

## Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

## Potential Alternatives

None



into the ground or be collected and reused.

- Authorized non-stormwater discharges to the storm drain system, channels, or receiving waters are acceptable with the implementation of appropriate BMPs.
- Lock water tank valves to prevent unauthorized use.

## Costs

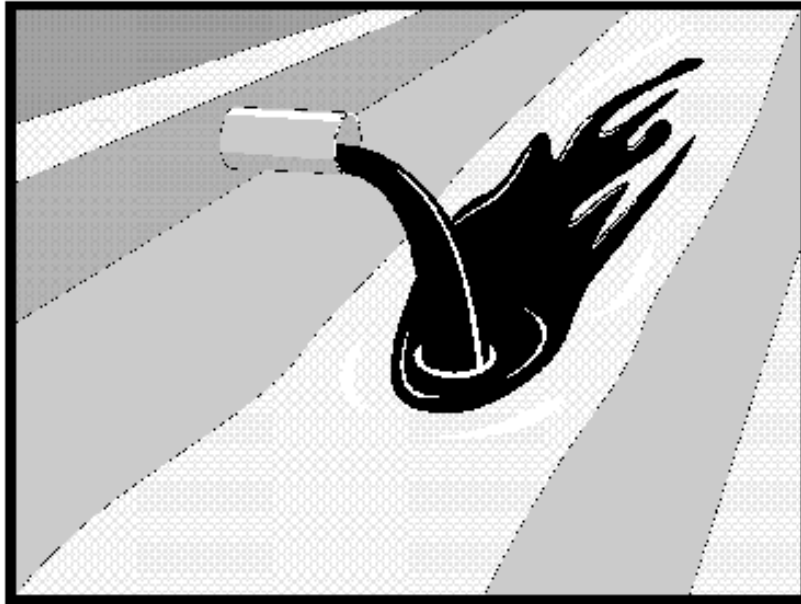
The cost is small to none compared to the benefits of conserving water.

## Inspection and Maintenance

- Inspect and verify that activity based BMPs are in place prior to the commencement of authorized non-stormwater discharges.
- Inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges are occurring.
- Repair water equipment as needed to prevent unintended discharges.
  - Water trucks
  - Water reservoirs (water buffalos)
  - Irrigation systems
  - Hydrant connections

## References

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.



### Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
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### Legend:

- Primary Objective
- Secondary Objective

### Targeted Constituents

Sediment	
Nutrients	<input checked="" type="checkbox"/>
Trash	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>
Bacteria	<input checked="" type="checkbox"/>
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>

### Potential Alternatives

None

### Description and Purpose

Procedures and practices designed for construction contractors to recognize illicit connections or illegally dumped or discharged materials on a construction site and report incidents.

### Suitable Applications

This best management practice (BMP) applies to all construction projects. Illicit connection/discharge and reporting is applicable anytime an illicit connection or discharge is discovered or illegally dumped material is found on the construction site.

### Limitations

Illicit connections and illegal discharges or dumping, for the purposes of this BMP, refer to discharges and dumping caused by parties other than the contractor. If pre-existing hazardous materials or wastes are known to exist onsite, they should be identified in the SWPPP and handled as set forth in the SWPPP.

### Implementation

#### Planning

- Review the SWPPP. Pre-existing areas of contamination should be identified and documented in the SWPPP.
- Inspect site before beginning the job for evidence of illicit connections, illegal dumping or discharges. Document any pre-existing conditions and notify the owner.
- Inspect site regularly during project execution for evidence



of illicit connections, illegal dumping or discharges.

- Observe site perimeter for evidence for potential of illicitly discharged or illegally dumped material, which may enter the job site.

### ***Identification of Illicit Connections and Illegal Dumping or Discharges***

- **General** – unlabeled and unidentifiable material should be treated as hazardous.
- **Solids** - Look for debris, or rubbish piles. Solid waste dumping often occurs on roadways with light traffic loads or in areas not easily visible from the traveled way.
- **Liquids** - signs of illegal liquid dumping or discharge can include:
  - Visible signs of staining or unusual colors to the pavement or surrounding adjacent soils
  - Pungent odors coming from the drainage systems
  - Discoloration or oily substances in the water or stains and residues detained within ditches, channels or drain boxes
  - Abnormal water flow during the dry weather season
- **Urban Areas** - Evidence of illicit connections or illegal discharges is typically detected at storm drain outfall locations or at manholes. Signs of an illicit connection or illegal discharge can include:
  - Abnormal water flow during the dry weather season
  - Unusual flows in sub drain systems used for dewatering
  - Pungent odors coming from the drainage systems
  - Discoloration or oily substances in the water or stains and residues detained within ditches, channels or drain boxes
  - Excessive sediment deposits, particularly adjacent to or near active offsite construction projects
- **Rural Areas** - Illicit connections or illegal discharges involving irrigation drainage ditches are detected by visual inspections. Signs of an illicit discharge can include:
  - Abnormal water flow during the non-irrigation season
  - Non-standard junction structures
  - Broken concrete or other disturbances at or near junction structures

### ***Reporting***

Notify the owner of any illicit connections and illegal dumping or discharge incidents at the time of discovery. For illicit connections or discharges to the storm drain system, notify the local stormwater management agency. For illegal dumping, notify the local law enforcement agency.

### ***Cleanup and Removal***

The responsibility for cleanup and removal of illicit or illegal dumping or discharges will vary by location. Contact the local stormwater management agency for further information.



## Costs

Costs to look for and report illicit connections and illegal discharges and dumping are low. The best way to avoid costs associated with illicit connections and illegal discharges and dumping is to keep the project perimeters secure to prevent access to the site, to observe the site for vehicles that should not be there, and to document any waste or hazardous materials that exist onsite before taking possession of the site.

## Inspection and Maintenance

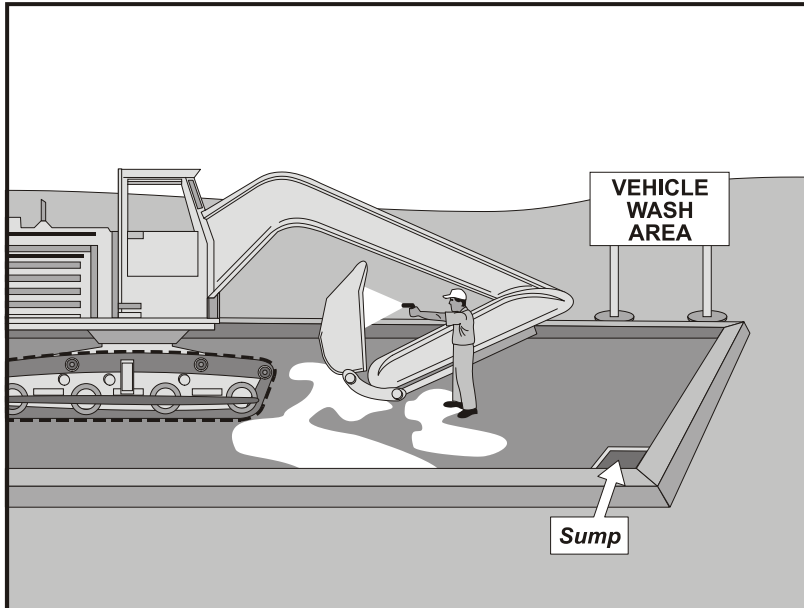
- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Inspect the site regularly to check for any illegal dumping or discharge.
- Prohibit employees and subcontractors from disposing of non-job related debris or materials at the construction site.
- Notify the owner of any illicit connections and illegal dumping or discharge incidents at the time of discovery.

## References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.



## Description and Purpose

Vehicle and equipment cleaning procedures and practices eliminate or reduce the discharge of pollutants to stormwater from vehicle and equipment cleaning operations. Procedures and practices include but are not limited to: using offsite facilities; washing in designated, contained areas only; eliminating discharges to the storm drain by infiltrating the wash water; and training employees and subcontractors in proper cleaning procedures.

## Suitable Applications

These procedures are suitable on all construction sites where vehicle and equipment cleaning is performed.

## Limitations

Even phosphate-free, biodegradable soaps have been shown to be toxic to fish before the soap degrades. Sending vehicles/equipment offsite should be done in conjunction with TC-1, Stabilized Construction Entrance/Exit.

## Implementation

Other options to washing equipment onsite include contracting with either an offsite or mobile commercial washing business. These businesses may be better equipped to handle and dispose of the wash waters properly. Performing this work offsite can also be economical by eliminating the need for a separate washing operation onsite.

If washing operations are to take place onsite, then:

## Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	<input checked="" type="checkbox"/>
WM	Waste Management and Materials Pollution Control	

## Legend:

- Primary Objective
- Secondary Objective

## Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	<input checked="" type="checkbox"/>
Trash	
Metals	
Bacteria	
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>

## Potential Alternatives

None



- Use phosphate-free, biodegradable soaps.
- Educate employees and subcontractors on pollution prevention measures.
- Do not permit steam cleaning onsite. Steam cleaning can generate significant pollutant concentrates.
- Cleaning of vehicles and equipment with soap, solvents or steam should not occur on the project site unless resulting wastes are fully contained and disposed of. Resulting wastes should not be discharged or buried, and must be captured and recycled or disposed according to the requirements of WM-10, Liquid Waste Management or WM-6, Hazardous Waste Management, depending on the waste characteristics. Minimize use of solvents. Use of diesel for vehicle and equipment cleaning is prohibited.
- All vehicles and equipment that regularly enter and leave the construction site must be cleaned offsite.
- When vehicle and equipment washing and cleaning must occur onsite, and the operation cannot be located within a structure or building equipped with appropriate disposal facilities, the outside cleaning area should have the following characteristics:
  - Located away from storm drain inlets, drainage facilities, or watercourses
  - Paved with concrete or asphalt and bermed to contain wash waters and to prevent runoff
  - Configured with a sump to allow collection and disposal of wash water
  - No discharge of wash waters to storm drains or watercourses
  - Used only when necessary
- When cleaning vehicles and equipment with water:
  - Use as little water as possible. High-pressure sprayers may use less water than a hose and should be considered
  - Use positive shutoff valve to minimize water usage
  - Facility wash racks should discharge to a sanitary sewer, recycle system or other approved discharge system and must not discharge to the storm drainage system, watercourses, or to groundwater

## Costs

Cleaning vehicles and equipment at an offsite facility may reduce overall costs for vehicle and equipment cleaning by eliminating the need to provide similar services onsite. When onsite cleaning is needed, the cost to establish appropriate facilities is relatively low on larger, long-duration projects, and moderate to high on small, short-duration projects.

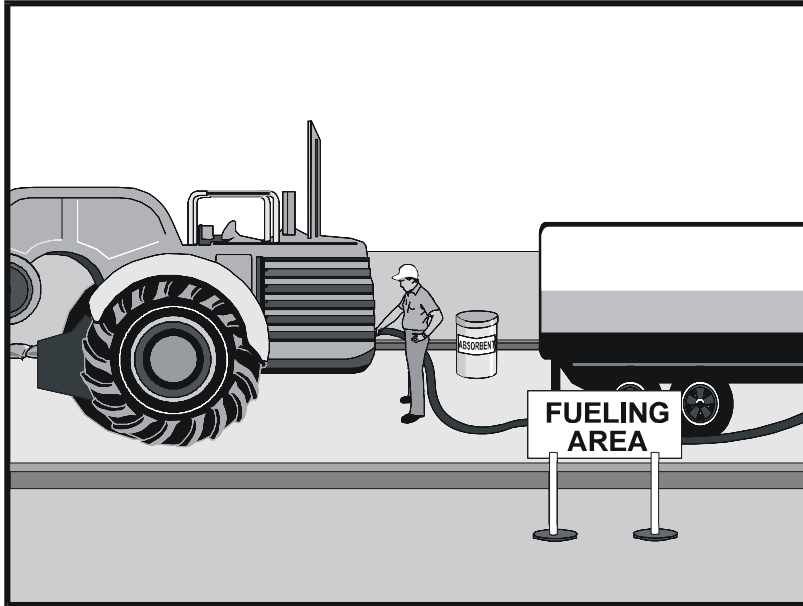
## Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges occur.
- Inspection and maintenance is minimal, although some berm repair may be necessary.
- Monitor employees and subcontractors throughout the duration of the construction project to ensure appropriate practices are being implemented.
- Inspect sump regularly and remove liquids and sediment as needed.
- Prohibit employees and subcontractors from washing personal vehicles and equipment on the construction site.

## References

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Swisher, R.D. Surfactant Biodegradation, Marcel Decker Corporation, 1987.



### Description and Purpose

Vehicle equipment fueling procedures and practices are designed to prevent fuel spills and leaks, and reduce or eliminate contamination of stormwater. This can be accomplished by using offsite facilities, fueling in designated areas only, enclosing or covering stored fuel, implementing spill controls, and training employees and subcontractors in proper fueling procedures.

### Suitable Applications

These procedures are suitable on all construction sites where vehicle and equipment fueling takes place.

### Limitations

Onsite vehicle and equipment fueling should only be used where it is impractical to send vehicles and equipment offsite for fueling. Sending vehicles and equipment offsite should be done in conjunction with TC-1, Stabilized Construction Entrance/ Exit.

### Implementation

- Use offsite fueling stations as much as possible. These businesses are better equipped to handle fuel and spills properly. Performing this work offsite can also be economical by eliminating the need for a separate fueling area at a site.
- Discourage “topping-off” of fuel tanks.
- Absorbent spill cleanup materials and spill kits should be available in fueling areas and on fueling trucks, and should

### Categories

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### Legend:

- Primary Objective
- Secondary Objective

### Targeted Constituents

Sediment	
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	<input checked="" type="checkbox"/>
Organics	

### Potential Alternatives

None



be disposed of properly after use.

- Drip pans or absorbent pads should be used during vehicle and equipment fueling, unless the fueling is performed over an impermeable surface in a dedicated fueling area.
- Use absorbent materials on small spills. Do not hose down or bury the spill. Remove the adsorbent materials promptly and dispose of properly.
- Avoid mobile fueling of mobile construction equipment around the site; rather, transport the equipment to designated fueling areas. With the exception of tracked equipment such as bulldozers and large excavators, most vehicles should be able to travel to a designated area with little lost time.
- Train employees and subcontractors in proper fueling and cleanup procedures.
- When fueling must take place onsite, designate an area away from drainage courses to be used. Fueling areas should be identified in the SWPPP.
- Dedicated fueling areas should be protected from stormwater runoff and should be located at least 50 ft away from downstream drainage facilities and watercourses. Fueling must be performed on level-grade areas.
- Protect fueling areas with berms and dikes to prevent runoff, and to contain spills.
- Nozzles used in vehicle and equipment fueling should be equipped with an automatic shutoff to control drips. Fueling operations should not be left unattended.
- Use vapor recovery nozzles to help control drips as well as air pollution where required by Air Quality Management Districts (AQMD).
- Federal, state, and local requirements should be observed for any stationary above ground storage tanks.

## Costs

- All of the above measures are low cost except for the capital costs of above ground tanks that meet all local environmental, zoning, and fire codes.

## Inspection and Maintenance

- Inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Vehicles and equipment should be inspected each day of use for leaks. Leaks should be repaired immediately or problem vehicles or equipment should be removed from the project site.
- Keep ample supplies of spill cleanup materials onsite.

- Immediately clean up spills and properly dispose of contaminated soil and cleanup materials.

## References

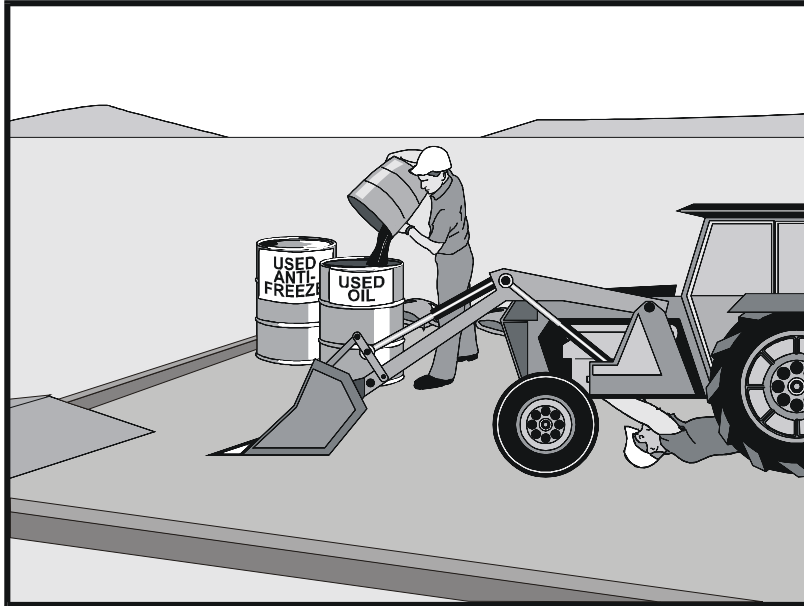
Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance, Working Group Working Paper; USEPA, April 1992.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

# Vehicle & Equipment Maintenance NS-10



## Description and Purpose

Prevent or reduce the contamination of stormwater resulting from vehicle and equipment maintenance by running a “dry and clean site”. The best option would be to perform maintenance activities at an offsite facility. If this option is not available then work should be performed in designated areas only, while providing cover for materials stored outside, checking for leaks and spills, and containing and cleaning up spills immediately. Employees and subcontractors must be trained in proper procedures.

## Suitable Applications

These procedures are suitable on all construction projects where an onsite yard area is necessary for storage and maintenance of heavy equipment and vehicles.

## Limitations

Onsite vehicle and equipment maintenance should only be used where it is impractical to send vehicles and equipment offsite for maintenance and repair. Sending vehicles/equipment offsite should be done in conjunction with TC-1, Stabilized Construction Entrance/Exit.

Outdoor vehicle or equipment maintenance is a potentially significant source of stormwater pollution. Activities that can contaminate stormwater include engine repair and service, changing or replacement of fluids, and outdoor equipment storage and parking (engine fluid leaks). For further information on vehicle or equipment servicing, see NS-8, Vehicle and Equipment Cleaning, and NS-9, Vehicle and

## Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	<input checked="" type="checkbox"/>
WM	Waste Management and Materials Pollution Control	

## Legend:

- Primary Objective
- Secondary Objective

## Targeted Constituents

Sediment	
Nutrients	<input checked="" type="checkbox"/>
Trash	<input checked="" type="checkbox"/>
Metals	
Bacteria	
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>

## Potential Alternatives

None





# Vehicle & Equipment Maintenance NS-10

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## Equipment Fueling.

### Implementation

- Use offsite repair shops as much as possible. These businesses are better equipped to handle vehicle fluids and spills properly. Performing this work offsite can also be economical by eliminating the need for a separate maintenance area.
- If maintenance must occur onsite, use designated areas, located away from drainage courses. Dedicated maintenance areas should be protected from stormwater runoff and runoff, and should be located at least 50 ft from downstream drainage facilities and watercourses.
- Drip pans or absorbent pads should be used during vehicle and equipment maintenance work that involves fluids, unless the maintenance work is performed over an impermeable surface in a dedicated maintenance area.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- All fueling trucks and fueling areas are required to have spill kits and/or use other spill protection devices.
- Use adsorbent materials on small spills. Remove the absorbent materials promptly and dispose of properly.
- Inspect onsite vehicles and equipment daily at startup for leaks, and repair immediately.
- Keep vehicles and equipment clean; do not allow excessive build-up of oil and grease.
- Segregate and recycle wastes, such as greases, used oil or oil filters, antifreeze, cleaning solutions, automotive batteries, hydraulic and transmission fluids. Provide secondary containment and covers for these materials if stored onsite.
- Train employees and subcontractors in proper maintenance and spill cleanup procedures.
- Drip pans or plastic sheeting should be placed under all vehicles and equipment placed on docks, barges, or other structures over water bodies when the vehicle or equipment is planned to be idle for more than 1 hour.
- For long-term projects, consider using portable tents or covers over maintenance areas if maintenance cannot be performed offsite.
- Consider use of new, alternative greases and lubricants, such as adhesive greases, for chassis lubrication and fifth-wheel lubrication.
- Properly dispose of used oils, fluids, lubricants, and spill cleanup materials.
- Do not place used oil in a dumpster or pour into a storm drain or watercourse.
- Properly dispose of or recycle used batteries.
- Do not bury used tires.

# Vehicle & Equipment Maintenance NS-10

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- Repair leaks of fluids and oil immediately.

Listed below is further information if you must perform vehicle or equipment maintenance onsite.

## ***Safer Alternative Products***

- Consider products that are less toxic or hazardous than regular products. These products are often sold under an “environmentally friendly” label.
- Consider use of grease substitutes for lubrication of truck fifth-wheels. Follow manufacturers label for details on specific uses.
- Consider use of plastic friction plates on truck fifth-wheels in lieu of grease. Follow manufacturers label for details on specific uses.

## ***Waste Reduction***

Parts are often cleaned using solvents such as trichloroethylene, trichloroethane, or methylene chloride. Many of these cleaners are listed in California Toxic Rule as priority pollutants. These materials are harmful and must not contaminate stormwater. They must be disposed of as a hazardous waste. Reducing the number of solvents makes recycling easier and reduces hazardous waste management costs. Often, one solvent can perform a job as well as two different solvents. Also, if possible, eliminate or reduce the amount of hazardous materials and waste by substituting non-hazardous or less hazardous materials. For example, replace chlorinated organic solvents with non-chlorinated solvents. Non-chlorinated solvents like kerosene or mineral spirits are less toxic and less expensive to dispose of properly. Check the list of active ingredients to see whether it contains chlorinated solvents. The “chlor” term indicates that the solvent is chlorinated. Also, try substituting a wire brush for solvents to clean parts.

## ***Recycling and Disposal***

Separating wastes allows for easier recycling and may reduce disposal costs. Keep hazardous wastes separate, do not mix used oil solvents, and keep chlorinated solvents (like, -trichloroethane) separate from non-chlorinated solvents (like kerosene and mineral spirits). Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around. Provide cover and secondary containment until these materials can be removed from the site.

Oil filters can be recycled. Ask your oil supplier or recycler about recycling oil filters.

Do not dispose of extra paints and coatings by dumping liquid onto the ground or throwing it into dumpsters. Allow coatings to dry or harden before disposal into covered dumpsters.

Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries, even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

## **Costs**

All of the above are low cost measures. Higher costs are incurred to setup and maintain onsite maintenance areas.

# Vehicle & Equipment Maintenance NS-10

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## Inspection and Maintenance

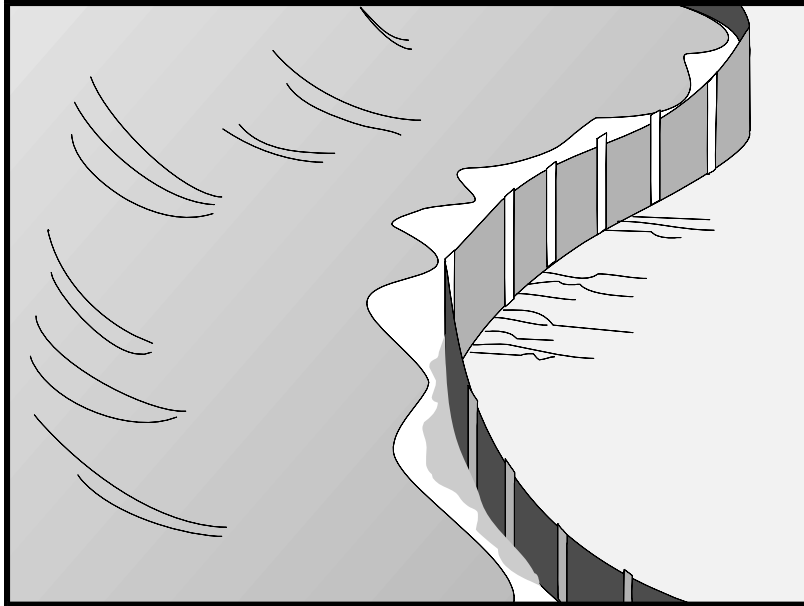
- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges occur.
- Keep ample supplies of spill cleanup materials onsite.
- Maintain waste fluid containers in leak proof condition.
- Vehicles and equipment should be inspected on each day of use. Leaks should be repaired immediately or the problem vehicle(s) or equipment should be removed from the project site.
- Inspect equipment for damaged hoses and leaky gaskets routinely. Repair or replace as needed.

## References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Coastal Nonpoint Pollution Control Program; Program Development and Approval Guidance, Working Group, Working Paper; USEPA, April 1992.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.



## Description and Purpose

A silt fence is made of a woven geotextile that has been entrenched, attached to supporting poles, and sometimes backed by a plastic or wire mesh for support. The silt fence detains sediment-laden water, promoting sedimentation behind the fence.

## Suitable Applications

Silt fences are suitable for perimeter control, placed below areas where sheet flows discharge from the site. They could also be used as interior controls below disturbed areas where runoff may occur in the form of sheet and rill erosion and around inlets within disturbed areas (SE-10). Silt fences are generally ineffective in locations where the flow is concentrated and are only applicable for sheet or overland flows. Silt fences are most effective when used in combination with erosion controls. Suitable applications include:

- Along the perimeter of a project.
- Below the toe or down slope of exposed and erodible slopes.
- Along streams and channels.
- Around temporary spoil areas and stockpiles.
- Around inlets.
- Below other small cleared areas.

## Categories

EC	Erosion Control	
SE	Sediment Control	<input checked="" type="checkbox"/>
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

## Legend:

- Primary Category
- Secondary Category

## Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

## Potential Alternatives

- SE-5 Fiber Rolls
- SE-6 Gravel Bag Berm
- SE-8 Sandbag Barrier
- SE-10 Storm Drain Inlet Protection
- SE-14 Biofilter Bags



## Limitations

- Do not use in streams, channels, drain inlets, or anywhere flow is concentrated.
- Do not use in locations where ponded water may cause a flooding hazard. Runoff typically ponds temporarily on the upstream side of silt fence.
- Do not use silt fence to divert water flows or place across any contour line. Fences not constructed on a level contour, or fences used to divert flow will concentrate flows resulting in additional erosion and possibly overtopping or failure of the silt fence.
- Improperly installed fences are subject to failure from undercutting, overtopping, or collapsing.
- Not effective unless trenched and keyed in.
- Not intended for use as mid-slope protection on slopes greater than 4:1 (H:V).
- Do not use on slopes subject to creeping, slumping, or landslides.

## Implementation

### ***General***

A silt fence is a temporary sediment barrier consisting of woven geotextile stretched across and attached to supporting posts, trenched-in, and, depending upon the strength of fabric used, supported with plastic or wire mesh fence. Silt fences trap sediment by intercepting and detaining small amounts of sediment-laden runoff from disturbed areas in order to promote sedimentation behind the fence.

The following layout and installation guidance can improve performance and should be followed:

- Use principally in areas where sheet flow occurs.
- Install along a level contour, so water does not pond more than 1.5 ft at any point along the silt fence.
- The maximum length of slope draining to any point along the silt fence should be 200 ft or less.
- The maximum slope perpendicular to the fence line should be 1:1.
- Provide sufficient room for runoff to pond behind the fence and to allow sediment removal equipment to pass between the silt fence and toes of slopes or other obstructions. About 1200 ft<sup>2</sup> of ponding area should be provided for every acre draining to the fence.
- Turn the ends of the filter fence uphill to prevent stormwater from flowing around the fence.
- Leave an undisturbed or stabilized area immediately down slope from the fence where feasible.

- Silt fences should remain in place until the disturbed area is permanently stabilized, after which, the silt fence should be removed and properly disposed.
- Silt fence should be used in combination with erosion source controls up slope in order to provide the most effective sediment control.
- Be aware of local regulations regarding the type and installation requirements of silt fence, which may differ from those presented in this fact sheet.

## ***Design and Layout***

The fence should be supported by a plastic or wire mesh if the fabric selected does not have sufficient strength and bursting strength characteristics for the planned application (as recommended by the fabric manufacturer). Woven geotextile material should contain ultraviolet inhibitors and stabilizers to provide a minimum of six months of expected usable construction life at a temperature range of 0 °F to 120 °F.

- Layout in accordance with attached figures.
- For slopes steeper than 2:1 (H:V) and that contain a high number of rocks or large dirt clods that tend to dislodge, it may be necessary to install additional protection immediately adjacent to the bottom of the slope, prior to installing silt fence. Additional protection may be a chain link fence or a cable fence.
- For slopes adjacent to sensitive receiving waters or Environmentally Sensitive Areas (ESAs), silt fence should be used in conjunction with erosion control BMPs.

## ***Standard vs. Heavy Duty Silt Fence***

### *Standard Silt Fence*

- Generally applicable in cases where the slope of area draining to the silt fence is 4:1 (H:V) or less.
- Used for shorter durations, typically 5 months or less
- Area draining to fence produces moderate sediment loads.

### *Heavy Duty Silt Fence*

- Use is generally limited to 8 months or less.
- Area draining to fence produces moderate sediment loads.
- Heavy duty silt fence usually has 1 or more of the following characteristics, not possessed by standard silt fence.
  - Fence fabric has higher tensile strength.
  - Fabric is reinforced with wire backing or additional support.
  - Posts are spaced closer than pre-manufactured, standard silt fence products.
  - Posts are metal (steel or aluminum)

## ***Materials***

### **Standard Silt Fence**

- Silt fence material should be woven geotextile with a minimum width of 36 in. and a minimum tensile strength of 100 lb force. The fabric should conform to the requirements in ASTM designation D4632 and should have an integral reinforcement layer. The

reinforcement layer should be a polypropylene, or equivalent, net provided by the manufacturer. The permittivity of the fabric should be between  $0.1 \text{ sec}^{-1}$  and  $0.15 \text{ sec}^{-1}$  in conformance with the requirements in ASTM designation D4491.

- Wood stakes should be commercial quality lumber of the size and shape shown on the plans. Each stake should be free from decay, splits or cracks longer than the thickness of the stake or other defects that would weaken the stakes and cause the stakes to be structurally unsuitable.
- Staples used to fasten the fence fabric to the stakes should be not less than 1.75 in. long and should be fabricated from 15 gauge or heavier wire. The wire used to fasten the tops of the stakes together when joining two sections of fence should be 9 gauge or heavier wire. Galvanizing of the fastening wire will not be required.

### Heavy-Duty Silt Fence

- Some silt fence has a wire backing to provide additional support, and there are products that may use prefabricated plastic holders for the silt fence and use metal posts or bar reinforcement instead of wood stakes. If bar reinforcement is used in lieu of wood stakes, use number four or greater bar. Provide end protection for any exposed bar reinforcement for health and safety purposes.

### ***Installation Guidelines – Traditional Method***

Silt fences are to be constructed on a level contour. Sufficient area should exist behind the fence for ponding to occur without flooding or overtopping the fence.

- A trench should be excavated approximately 6 in. wide and 6 in. deep along the line of the proposed silt fence (trenches should not be excavated wider or deeper than necessary for proper silt fence installation).
- Bottom of the silt fence should be keyed-in a minimum of 12 in.
- Posts should be spaced a maximum of 6 ft apart and driven securely into the ground a minimum of 18 in. or 12 in. below the bottom of the trench.
- When standard strength geotextile is used, a plastic or wire mesh support fence should be fastened securely to the upslope side of posts using heavy-duty wire staples at least 1 in. long. The mesh should extend into the trench.
- When extra-strength geotextile and closer post spacing are used, the mesh support fence may be eliminated.
- Woven geotextile should be purchased in a long roll, then cut to the length of the barrier. When joints are necessary, geotextile should be spliced together only at a support post, with a minimum 6 in. overlap and both ends securely fastened to the post.
- The trench should be backfilled with native material and compacted.
- Construct silt fences with a setback of at least 3 ft from the toe of a slope. Where, due to specific site conditions, a 3 ft setback is not available, the silt fence may be constructed at the

toe of the slope, but should be constructed as far from the toe of the slope as practicable. Silt fences close to the toe of the slope will be less effective and more difficult to maintain.

- Construct the length of each reach so that the change in base elevation along the reach does not exceed 1/3 the height of the barrier; in no case should the reach exceed 500 ft.
- Cross barriers should be a minimum of 1/3 and a maximum of 1/2 the height of the linear barrier.
- See typical installation details at the end of this fact sheet.

### ***Installation Guidelines - Static Slicing Method***

- Static Slicing is defined as insertion of a narrow blade pulled behind a tractor, similar to a plow blade, at least 10 inches into the soil while at the same time pulling silt geotextile fabric into the ground through the opening created by the blade to the depth of the blade. Once the geotextile is installed, the soil is compacted using tractor tires.
- This method will not work with pre-fabricated, wire backed silt fence.
- Benefits:
  - Ease of installation (most often done with a 2 person crew). In addition, installation using static slicing has been found to be more efficient on slopes, in rocky soils, and in saturated soils.
  - Minimal soil disturbance.
  - Greater level of compaction along fence, leading to higher performance (i.e. greater sediment retention).
  - Uniform installation.
  - Less susceptible to undercutting/undermining.

### **Costs**

- It should be noted that costs vary greatly across regions due to available supplies and labor costs.
- Average annual cost for installation using the traditional silt fence installation method (assumes 6 month useful life) is \$7 per linear foot based on vendor research. Range of cost is \$3.50 - \$9.10 per linear foot.
- In tests, the slicing method required 0.33 man hours per 100 linear feet, while the trenched based systems required as much as 1.01 man hours per linear foot.

### **Inspection and Maintenance**

- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Repair undercut silt fences.



- Repair or replace split, torn, slumping, or weathered fabric. The lifespan of silt fence fabric is generally 5 to 8 months.
- Silt fences that are damaged and become unsuitable for the intended purpose should be removed from the site of work, disposed, and replaced with new silt fence barriers.
- Sediment that accumulates in the BMP should be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches one-third of the barrier height.
- Silt fences should be left in place until the upstream area is permanently stabilized. Until then, the silt fence should be inspected and maintained regularly.
- Remove silt fence when upgradient areas are stabilized. Fill and compact post holes and anchor trench, remove sediment accumulation, grade fence alignment to blend with adjacent ground, and stabilize disturbed area.

## References

Manual of Standards of Erosion and Sediment Control Measures, Association of Bay Area Governments, May 1995.

National Management Measures to Control Nonpoint Source Pollution from Urban Areas, United States Environmental Protection Agency, 2002.

Proposed Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, Work Group-Working Paper, USEPA, April 1992.

Sedimentation and Erosion Control Practices, and Inventory of Current Practices (Draft), UESPA, 1990.

Southeastern Wisconsin Regional Planning Commission (SWRPC). Costs of Urban Nonpoint Source Water Pollution Control Measures. Technical Report No. 31. Southeastern Wisconsin Regional Planning Commission, Waukesha, WI. 1991

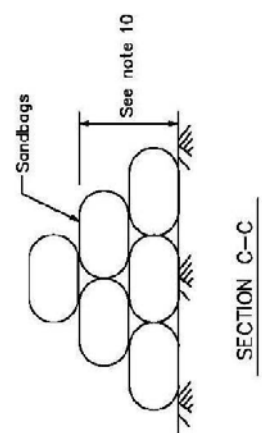
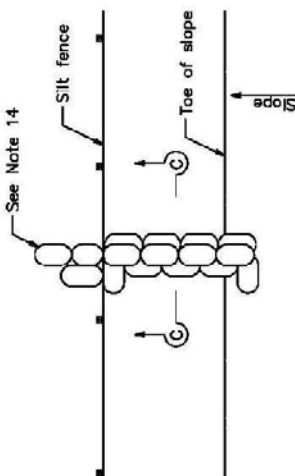
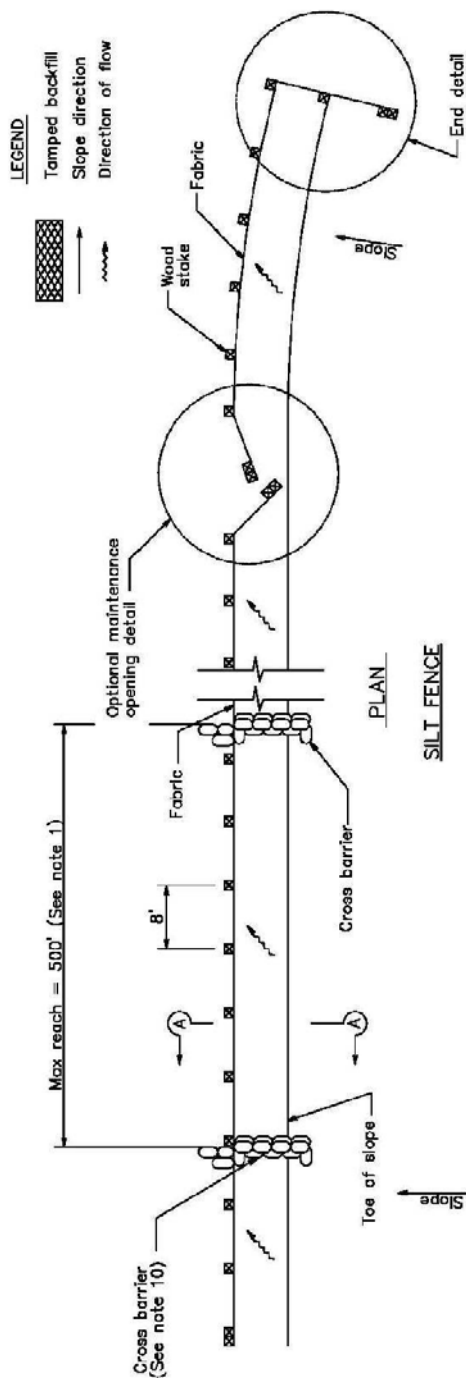
Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.

Stormwater Management Manual for The Puget Sound Basin, Washington State Department of Ecology, Public Review Draft, 1991.

U.S. Environmental Protection Agency (USEPA). Stormwater Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices. U.S. Environmental Protection Agency, Office of Water, Washington, DC, 1992.

Water Quality Management Plan for the Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency, November 1988. Soil Stabilization BMP Research for Erosion and Sediment Controls: Cost Survey Technical Memorandum, State of California Department of Transportation (Caltrans), July 2007.

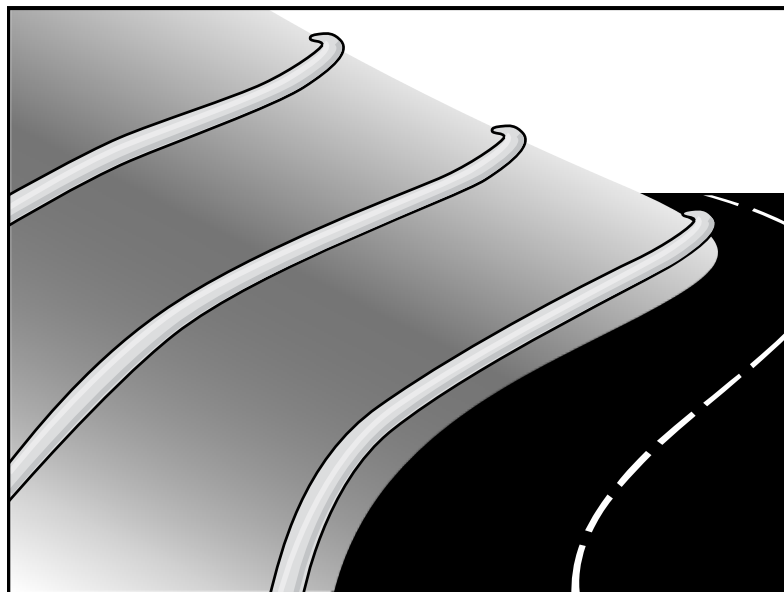
Erosion and Sediment Control Manual, Oregon Department of Environmental Quality, February 2005.



**NOTES**

1. Construct the length of each reach so that the change in base elevation along the reach does not exceed 1/3 the height of the linear barrier. In no case shall the reach length exceed 500'.
2. The last 8'-0" of fence shall be turned up slope.
3. Stake dimensions are nominal.
4. Dimension may vary to fit field condition.
5. Stakes shall be spaced at 8'-0" maximum and shall be positioned on downstream side of fence.
6. Stakes to overlap and fence fabric to fold around each stake one full turn. Secure fabric to stake with 4 staples.
7. Stakes shall be driven tightly together to prevent potential flow-through of sediment at joint. The tops of the stakes shall be secured with wire.
8. For end stake, fence fabric shall be folded around two stakes one full turn and secured with 4 staples.
9. Minimum 4 staples per stake. Dimensions shown are typical.
10. Cross barriers shall be a minimum of 1/3 and a maximum of 1/2 the height of the linear barrier.
11. Maintenance openings shall be constructed in a manner to ensure sediment remains behind silt fence.
12. Joining sections shall not be placed at sump locations.
13. Sandbag rows and layers shall be offset to eliminate gaps.
14. Add 3-4 bags to cross barrier on downgradient side of silt fence as needed to prevent bypass or undermining and as allowable based on site limits of disturbance.





## Description and Purpose

A fiber roll consists of straw, coir, or other biodegradable materials bound into a tight tubular roll wrapped by netting, which can be photodegradable or natural. Additionally, gravel core fiber rolls are available, which contain an imbedded ballast material such as gravel or sand for additional weight when staking the rolls are not feasible (such as use as inlet protection). When fiber rolls are placed at the toe and on the face of slopes along the contours, they intercept runoff, reduce its flow velocity, release the runoff as sheet flow, and provide removal of sediment from the runoff (through sedimentation). By interrupting the length of a slope, fiber rolls can also reduce sheet and rill erosion until vegetation is established.

## Suitable Applications

Fiber rolls may be suitable:

- Along the toe, top, face, and at grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow.
- At the end of a downward slope where it transitions to a steeper slope.
- Along the perimeter of a project.
- As check dams in unlined ditches with minimal grade.
- Down-slope of exposed soil areas.
- At operational storm drains as a form of inlet protection.

## Categories

EC	Erosion Control	<input checked="" type="checkbox"/>
SE	Sediment Control	<input checked="" type="checkbox"/>
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

## Legend:

- Primary Category
- Secondary Category

## Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

## Potential Alternatives

- SE-1 Silt Fence
- SE-6 Gravel Bag Berm
- SE-8 Sandbag Barrier
- SE-14 Biofilter Bags



- Around temporary stockpiles.

## Limitations

- Fiber rolls are not effective unless trenched in and staked.
- Not intended for use in high flow situations.
- Difficult to move once saturated.
- If not properly staked and trenched in, fiber rolls could be transported by high flows.
- Fiber rolls have a very limited sediment capture zone.
- Fiber rolls should not be used on slopes subject to creep, slumping, or landslide.
- Rolls typically function for 12-24 months depending upon local conditions.

## Implementation

### ***Fiber Roll Materials***

- Fiber rolls should be prefabricated.
- Fiber rolls may come manufactured containing polyacrylamide (PAM), a flocculating agent within the roll. Fiber rolls impregnated with PAM provide additional sediment removal capabilities and should be used in areas with fine, clayey or silty soils to provide additional sediment removal capabilities. Monitoring may be required for these installations.
- Fiber rolls are made from weed free rice straw, flax, or a similar agricultural material bound into a tight tubular roll by netting.
- Typical fiber rolls vary in diameter from 9 in. to 20 in. Larger diameter rolls are available as well.

### ***Installation***

- Locate fiber rolls on level contours spaced as follows:
  - Slope inclination of 4:1 (H:V) or flatter: Fiber rolls should be placed at a maximum interval of 20 ft.
  - Slope inclination between 4:1 and 2:1 (H:V): Fiber Rolls should be placed at a maximum interval of 15 ft. (a closer spacing is more effective).
  - Slope inclination 2:1 (H:V) or greater: Fiber Rolls should be placed at a maximum interval of 10 ft. (a closer spacing is more effective).
- Prepare the slope before beginning installation.
- Dig small trenches across the slope on the contour. The trench depth should be  $\frac{1}{4}$  to  $\frac{1}{3}$  of the thickness of the roll, and the width should equal the roll diameter, in order to provide area to backfill the trench.

- It is critical that rolls are installed perpendicular to water movement, and parallel to the slope contour.
- Start building trenches and installing rolls from the bottom of the slope and work up.
- It is recommended that pilot holes be driven through the fiber roll. Use a straight bar to drive holes through the roll and into the soil for the wooden stakes.
- Turn the ends of the fiber roll up slope to prevent runoff from going around the roll.
- Stake fiber rolls into the trench.
  - Drive stakes at the end of each fiber roll and spaced 4 ft maximum on center.
  - Use wood stakes with a nominal classification of 0.75 by 0.75 in. and minimum length of 24 in.
- If more than one fiber roll is placed in a row, the rolls should be overlapped, not abutted.
- See typical fiber roll installation details at the end of this fact sheet.

## ***Removal***

- Fiber rolls can be left in place or removed depending on the type of fiber roll and application (temporary vs. permanent installation). Typically, fiber rolls encased with plastic netting are used for a temporary application because the netting does not biodegrade. Fiber rolls used in a permanent application are typically encased with a biodegradable material and are left in place. Removal of a fiber roll used in a permanent application can result in greater disturbance.
- Temporary installations should only be removed when up gradient areas are stabilized per General Permit requirements, and/or pollutant sources no longer present a hazard. But, they should also be removed before vegetation becomes too mature so that the removal process does not disturb more soil and vegetation than is necessary.

## **Costs**

Material costs for regular fiber rolls range from \$20 - \$30 per 25 ft roll.

Material costs for PAM impregnated fiber rolls range between 7.00-\$9.00 per linear foot, based upon vendor research.

## **Inspection and Maintenance**

- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Repair or replace split, torn, unraveling, or slumping fiber rolls.
- If the fiber roll is used as a sediment capture device, or as an erosion control device to maintain sheet flows, sediment that accumulates in the BMP should be periodically removed

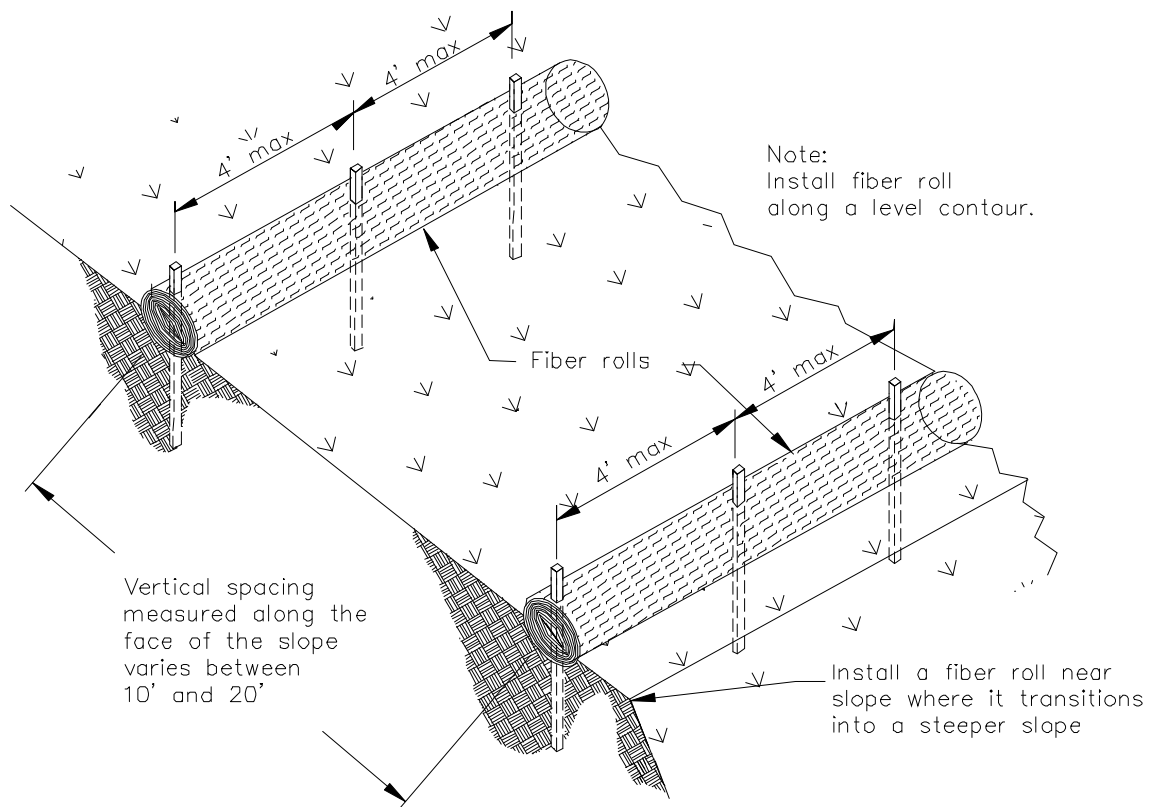
in order to maintain BMP effectiveness. Sediment should be removed when sediment accumulation reaches one-third the designated sediment storage depth.

- If fiber rolls are used for erosion control, such as in a check dam, sediment removal should not be required as long as the system continues to control the grade. Sediment control BMPs will likely be required in conjunction with this type of application.
- Repair any rills or gullies promptly.

## References

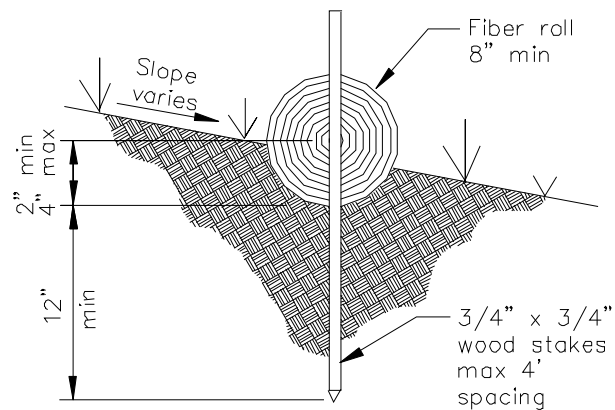
Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.

Erosion and Sediment Control Manual, Oregon Department of Environmental Quality, February 2005.



TYPICAL FIBER ROLL INSTALLATION

N.T.S.



ENTRENCHMENT DETAIL

N.T.S.





## Description and Purpose

Street sweeping and vacuuming includes use of self-propelled and walk-behind equipment to remove sediment from streets and roadways, and to clean paved surfaces in preparation for final paving. Sweeping and vacuuming prevents sediment from the project site from entering storm drains or receiving waters.

## Suitable Applications

Sweeping and vacuuming are suitable anywhere sediment is tracked from the project site onto public or private paved streets and roads, typically at points of egress. Sweeping and vacuuming are also applicable during preparation of paved surfaces for final paving.

## Limitations

Sweeping and vacuuming may not be effective when sediment is wet or when tracked soil is caked (caked soil may need to be scraped loose).

## Implementation

- Controlling the number of points where vehicles can leave the site will allow sweeping and vacuuming efforts to be focused, and perhaps save money.
- Inspect potential sediment tracking locations daily.
- Visible sediment tracking should be swept or vacuumed on a daily basis.
- Do not use kick brooms or sweeper attachments. These tend to spread the dirt rather than remove it.

## Categories

EC	Erosion Control	
SE	Sediment Control	<input checked="" type="checkbox"/>
TC	Tracking Control	<input checked="" type="checkbox"/>
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

## Legend:

- Primary Objective
- Secondary Objective

## Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	
Trash	<input checked="" type="checkbox"/>
Metals	
Bacteria	
Oil and Grease	<input checked="" type="checkbox"/>
Organics	

## Potential Alternatives

None



- If not mixed with debris or trash, consider incorporating the removed sediment back into the project

## Costs

Rental rates for self-propelled sweepers vary depending on hopper size and duration of rental. Expect rental rates from \$58/hour (3 yd<sup>3</sup> hopper) to \$88/hour (9 yd<sup>3</sup> hopper), plus operator costs. Hourly production rates vary with the amount of area to be swept and amount of sediment. Match the hopper size to the area and expect sediment load to minimize time spent dumping.

## Inspection and Maintenance

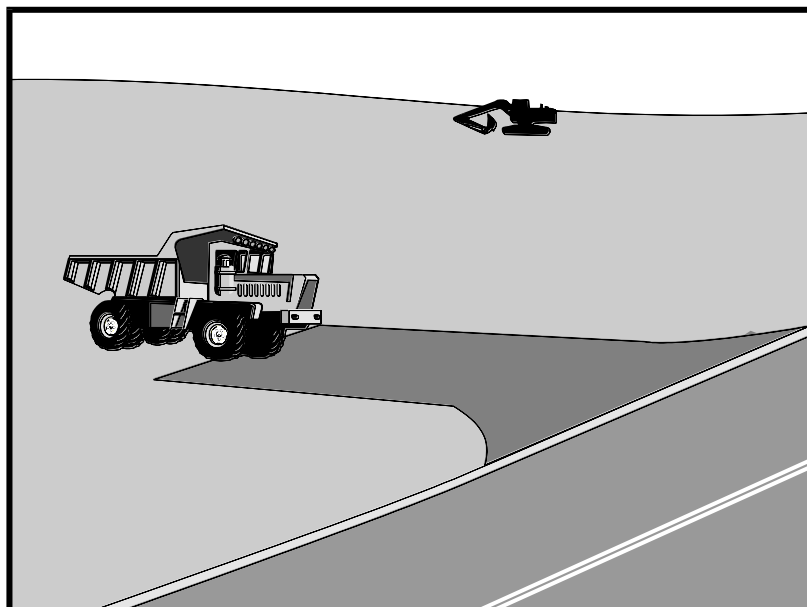
- Inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- When actively in use, points of ingress and egress must be inspected daily.
- When tracked or spilled sediment is observed outside the construction limits, it must be removed at least daily. More frequent removal, even continuous removal, may be required in some jurisdictions.
- Be careful not to sweep up any unknown substance or any object that may be potentially hazardous.
- Adjust brooms frequently; maximize efficiency of sweeping operations.
- After sweeping is finished, properly dispose of sweeper wastes at an approved dumpsite.

## References

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Labor Surcharge and Equipment Rental Rates, State of California Department of Transportation (Caltrans), April 1, 2002 – March 31, 2003.

# Stabilized Construction Entrance/Exit TC-1



## Description and Purpose

A stabilized construction access is defined by a point of entrance/exit to a construction site that is stabilized to reduce the tracking of mud and dirt onto public roads by construction vehicles.

## Suitable Applications

Use at construction sites:

- Where dirt or mud can be tracked onto public roads.
- Adjacent to water bodies.
- Where poor soils are encountered.
- Where dust is a problem during dry weather conditions.

## Limitations

- Entrances and exits require periodic top dressing with additional stones.
- This BMP should be used in conjunction with street sweeping on adjacent public right of way.
- Entrances and exits should be constructed on level ground only.
- Stabilized construction entrances are rather expensive to construct and when a wash rack is included, a sediment trap of some kind must also be provided to collect wash water runoff.

## Categories

EC	Erosion Control	<input checked="" type="checkbox"/>
SE	Sediment Control	<input checked="" type="checkbox"/>
TC	Tracking Control	<input checked="" type="checkbox"/>
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

## Legend:

- Primary Objective
- Secondary Objective

## Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

## Potential Alternatives

None



# Stabilized Construction Entrance/Exit TC-1

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## Implementation

### *General*

A stabilized construction entrance is a pad of aggregate underlain with filter cloth located at any point where traffic will be entering or leaving a construction site to or from a public right of way, street, alley, sidewalk, or parking area. The purpose of a stabilized construction entrance is to reduce or eliminate the tracking of sediment onto public rights of way or streets. Reducing tracking of sediments and other pollutants onto paved roads helps prevent deposition of sediments into local storm drains and production of airborne dust.

Where traffic will be entering or leaving the construction site, a stabilized construction entrance should be used. NPDES permits require that appropriate measures be implemented to prevent tracking of sediments onto paved roadways, where a significant source of sediments is derived from mud and dirt carried out from unpaved roads and construction sites.

Stabilized construction entrances are moderately effective in removing sediment from equipment leaving a construction site. The entrance should be built on level ground. Advantages of the Stabilized Construction Entrance/Exit is that it does remove some sediment from equipment and serves to channel construction traffic in and out of the site at specified locations. Efficiency is greatly increased when a washing rack is included as part of a stabilized construction entrance/exit.

### *Design and Layout*

- Construct on level ground where possible.
- Select 3 to 6 in. diameter stones.
- Use minimum depth of stones of 12 in. or as recommended by soils engineer.
- Construct length of 50 ft or maximum site will allow, and 10 ft minimum width or to accommodate traffic.
- Rumble racks constructed of steel panels with ridges and installed in the stabilized entrance/exit will help remove additional sediment and to keep adjacent streets clean.
- Provide ample turning radii as part of the entrance.
- Limit the points of entrance/exit to the construction site.
- Limit speed of vehicles to control dust.
- Properly grade each construction entrance/exit to prevent runoff from leaving the construction site.
- Route runoff from stabilized entrances/exits through a sediment trapping device before discharge.
- Design stabilized entrance/exit to support heaviest vehicles and equipment that will use it.

# **Stabilized Construction Entrance/Exit TC-1**

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- Select construction access stabilization (aggregate, asphaltic concrete, concrete) based on longevity, required performance, and site conditions. Do not use asphalt concrete (AC) grindings for stabilized construction access/roadway.
- If aggregate is selected, place crushed aggregate over geotextile fabric to at least 12 in. depth, or place aggregate to a depth recommended by a geotechnical engineer. A crushed aggregate greater than 3 in. but smaller than 6 in. should be used.
- Designate combination or single purpose entrances and exits to the construction site.
- Require that all employees, subcontractors, and suppliers utilize the stabilized construction access.
- Implement SE-7, Street Sweeping and Vacuuming, as needed.
- All exit locations intended to be used for more than a two-week period should have stabilized construction entrance/exit BMPs.

## **Inspection and Maintenance**

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMPs are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Inspect local roads adjacent to the site daily. Sweep or vacuum to remove visible accumulated sediment.
- Remove aggregate, separate and dispose of sediment if construction entrance/exit is clogged with sediment.
- Keep all temporary roadway ditches clear.
- Check for damage and repair as needed.
- Replace gravel material when surface voids are visible.
- Remove all sediment deposited on paved roadways within 24 hours.
- Remove gravel and filter fabric at completion of construction

## **Costs**

Average annual cost for installation and maintenance may vary from \$1,200 to \$4,800 each, averaging \$2,400 per entrance. Costs will increase with addition of washing rack, and sediment trap. With wash rack, costs range from \$1,200 - \$6,000 each, averaging \$3,600 per entrance.

## **References**

Manual of Standards of Erosion and Sediment Control Measures, Association of Bay Area Governments, May 1995.

# **Stabilized Construction Entrance/Exit TC-1**

National Management Measures to Control Nonpoint Source Pollution from Urban Areas, USEPA Agency, 2002.

Proposed Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, Work Group Working Paper, USEPA, April 1992.

Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

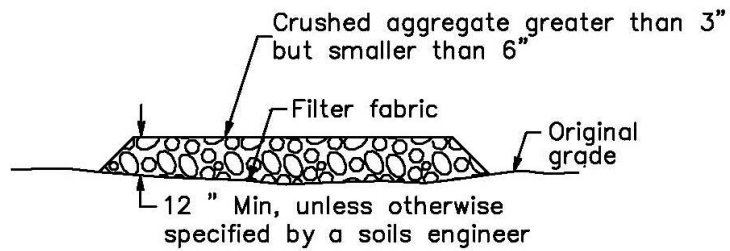
Stormwater Management of the Puget Sound Basin, Technical Manual, Publication #91-75, Washington State Department of Ecology, February 1992.

Virginia Erosion and Sedimentation Control Handbook, Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation, 1991.

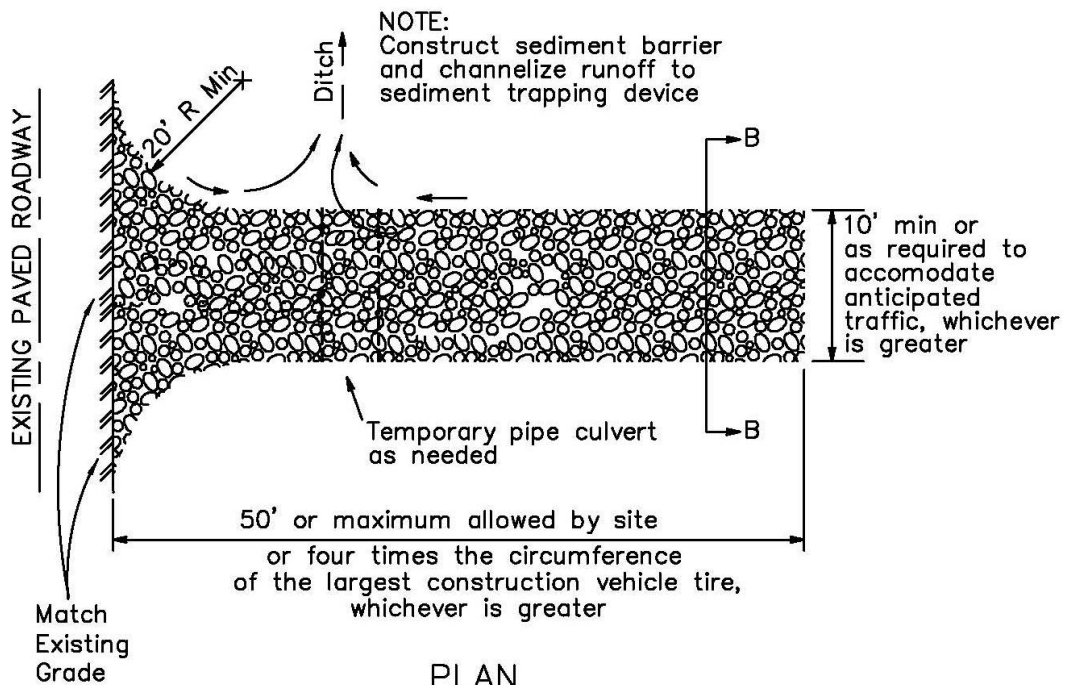
Guidance Specifying Management Measures for Nonpoint Pollution in Coastal Waters, EPA 840-B-9-002, USEPA, Office of Water, Washington, DC, 1993.

Water Quality Management Plan for the Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency, November 1988.

# Stabilized Construction Entrance/Exit TC-1

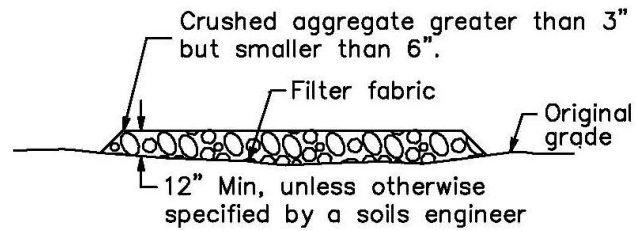


SECTION B-B  
NTS

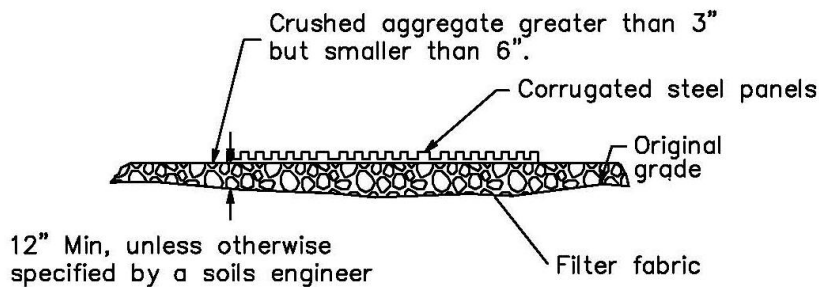


PLAN  
NTS

# Stabilized Construction Entrance/Exit TC-1

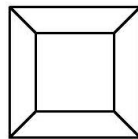


SECTION B-B  
NTS

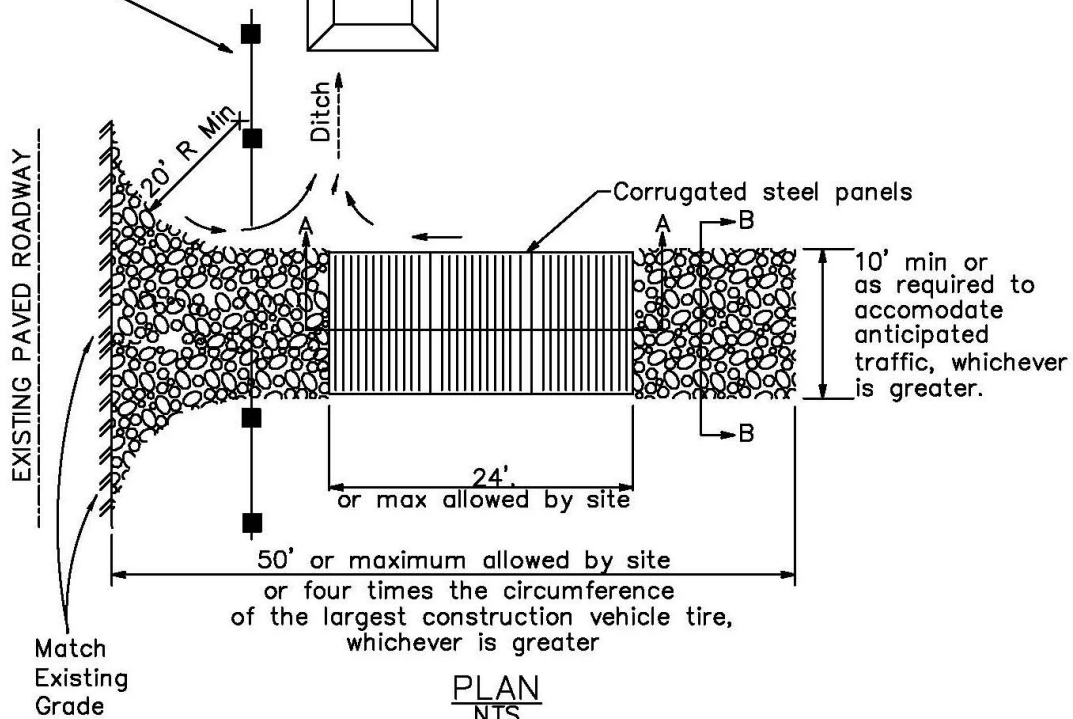


SECTION A-A  
NOT TO SCALE

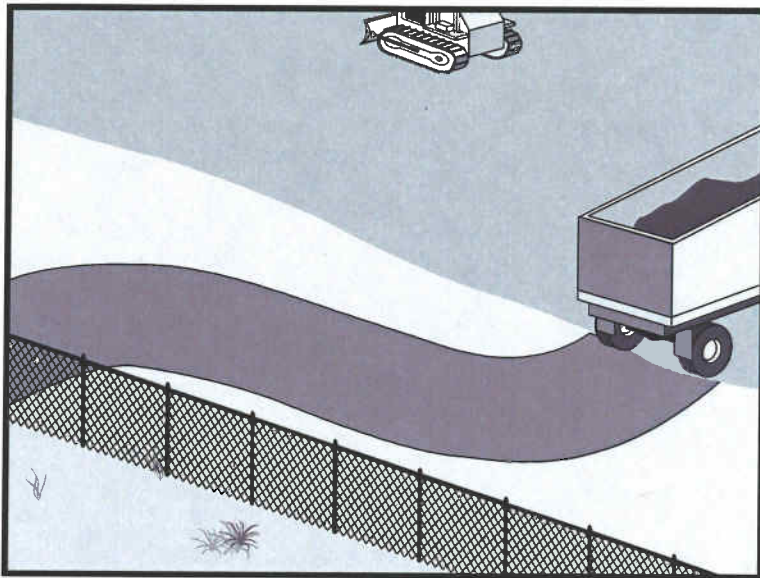
NOTE:  
Construct sediment barrier and channelize runoff to sediment trapping device



Sediment trapping device







## Description and Purpose

Access roads, subdivision roads, parking areas, and other onsite vehicle transportation routes should be stabilized immediately after grading, and frequently maintained to prevent erosion and control dust.

## Suitable Applications

This BMP should be applied for the following conditions:

- Temporary Construction Traffic:
  - Phased construction projects and offsite road access
  - Construction during wet weather
- Construction roadways and detour roads:
  - Where mud tracking is a problem during wet weather
  - Where dust is a problem during dry weather
  - Adjacent to water bodies
  - Where poor soils are encountered

## Limitations

- The roadway must be removed or paved when construction is complete.
- Certain chemical stabilization methods may cause stormwater or soil pollution and should not be used. See WE-1, Wind Erosion Control.

## Categories

<b>EC</b>	Erosion Control	<input checked="" type="checkbox"/>
<b>SE</b>	Sediment Control	<input checked="" type="checkbox"/>
<b>TC</b>	Tracking Control	<input checked="" type="checkbox"/>
<b>WE</b>	Wind Erosion Control	
<b>NS</b>	Non-Stormwater Management Control	
<b>WM</b>	Waste Management and Materials Pollution Control	

## Legend:

- Primary Objective
- Secondary Objective

## Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

## Potential Alternatives

None



# Stabilized Construction Roadway TC-2

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- Management of construction traffic is subject to air quality control measures. Contact the local air quality management agency.
- Materials will likely need to be removed prior to final project grading and stabilization.
- Use of this BMP may not be applicable to very short duration projects.

## Implementation

### *General*

Areas that are graded for construction vehicle transport and parking purposes are especially susceptible to erosion and dust. The exposed soil surface is continually disturbed, leaving no opportunity for vegetative stabilization. Such areas also tend to collect and transport runoff waters along their surfaces. During wet weather, they often become muddy quagmires that generate significant quantities of sediment that may pollute nearby streams or be transported offsite on the wheels of construction vehicles. Dirt roads can become so unstable during wet weather that they are virtually unusable.

Efficient construction road stabilization not only reduces onsite erosion but also can significantly speed onsite work, avoid instances of immobilized machinery and delivery vehicles, and generally improve site efficiency and working conditions during adverse weather

### *Installation/Application Criteria*

Permanent roads and parking areas should be paved as soon as possible after grading. As an alternative where construction will be phased, the early application of gravel or chemical stabilization may solve potential erosion and stability problems. Temporary gravel roadway should be considered during the rainy season and on slopes greater than 5%.

Temporary roads should follow the contour of the natural terrain to the maximum extent possible. Slope should not exceed 15%. Roadways should be carefully graded to drain transversely. Provide drainage swales on each side of the roadway in the case of a crowned section or one side in the case of a super elevated section. Simple gravel berms without a trench can also be used.

Installed inlets should be protected to prevent sediment laden water from entering the storm sewer system (SE-10, Storm Drain Inlet Protection). In addition, the following criteria should be considered.

- Road should follow topographic contours to reduce erosion of the roadway.
- The roadway slope should not exceed 15%.
- Chemical stabilizers or water are usually required on gravel or dirt roads to prevent dust (WE-1, Wind Erosion Control).
- Properly grade roadway to prevent runoff from leaving the construction site.
- Design stabilized access to support heaviest vehicles and equipment that will use it.

# Stabilized Construction Roadway TC-2

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- Stabilize roadway using aggregate, asphalt concrete, or concrete based on longevity, required performance, and site conditions. The use of cold mix asphalt or asphalt concrete (AC) grindings for stabilized construction roadway is not allowed.
- Coordinate materials with those used for stabilized construction entrance/exit points.
- If aggregate is selected, place crushed aggregate over geotextile fabric to at least 12 in. depth. A crushed aggregate greater than 3 in. but smaller than 6 in. should be used.

## Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Keep all temporary roadway ditches clear.
- When no longer required, remove stabilized construction roadway and re-grade and repair slopes.
- Periodically apply additional aggregate on gravel roads.
- Active dirt construction roads are commonly watered three or more times per day during the dry season.

## Costs

Gravel construction roads are moderately expensive, but cost is often balanced by reductions in construction delay. No additional costs for dust control on construction roads should be required above that needed to meet local air quality requirements.

## References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Coastal Nonpoint Pollution Control Program; Program Development and Approval Guidance, Working Group, Working Paper; USEPA, April 1992.

Manual of Standards of Erosion and Sediment Control Measures, Association of Bay Area Governments, May 1995.

Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

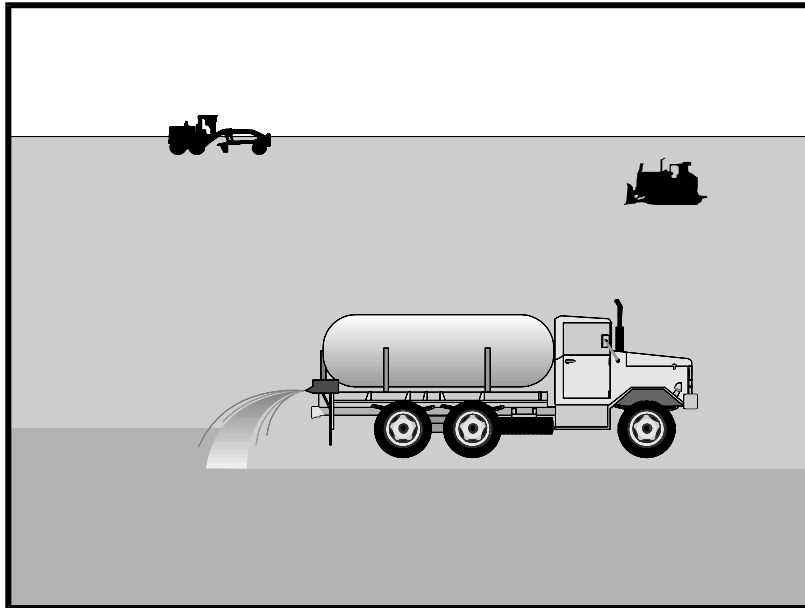
Stormwater Management of the Puget Sound Basin, Technical Manual, Publication #91-75, Washington State Department of Ecology, February 1992.

# **Stabilized Construction Roadway** **TC-2**

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Virginia Erosion and Sedimentation Control Handbook, Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation, 1991.

Water Quality Management Plan for the Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency, November 1988.



## Description and Purpose

Wind erosion or dust control consists of applying water or other chemical dust suppressants as necessary to prevent or alleviate dust nuisance generated by construction activities. Covering small stockpiles or areas is an alternative to applying water or other dust palliatives.

California’s Mediterranean climate, with a short “wet” season and a typically long, hot “dry” season, allows the soils to thoroughly dry out. During the dry season, construction activities are at their peak, and disturbed and exposed areas are increasingly subject to wind erosion, sediment tracking and dust generated by construction equipment. Site conditions and climate can make dust control more of an erosion problem than water based erosion. Additionally, many local agencies, including Air Quality Management Districts, require dust control and/or dust control permits in order to comply with local nuisance laws, opacity laws (visibility impairment) and the requirements of the Clean Air Act. Wind erosion control is required to be implemented at all construction sites greater than 1 acre by the General Permit.

## Suitable Applications

Most BMPs that provide protection against water-based erosion will also protect against wind-based erosion and dust control requirements required by other agencies will generally meet wind erosion control requirements for water quality protection. Wind erosion control BMPs are suitable during the following construction activities:

### Categories

EC	Erosion Control	
SE	Sediment Control	<input checked="" type="checkbox"/>
TC	Tracking Control	
WE	Wind Erosion Control	<input checked="" type="checkbox"/>
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

### Legend:

- Primary Category
- Secondary Category

### Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

### Potential Alternatives

EC-5 Soil Binders



- Construction vehicle traffic on unpaved roads
- Drilling and blasting activities
- Soils and debris storage piles
- Batch drop from front-end loaders
- Areas with unstabilized soil
- Final grading/site stabilization

## Limitations

- Watering prevents dust only for a short period (generally less than a few hours) and should be applied daily (or more often) to be effective.
- Over watering may cause erosion and track-out.
- Oil or oil-treated subgrade should not be used for dust control because the oil may migrate into drainageways and/or seep into the soil.
- Chemical dust suppression agents may have potential environmental impacts. Selected chemical dust control agents should be environmentally benign.
- Effectiveness of controls depends on soil, temperature, humidity, wind velocity and traffic.
- Chemical dust suppression agents should not be used within 100 feet of wetlands or water bodies.
- Chemically treated subgrades may make the soil water repellent, interfering with long-term infiltration and the vegetation/re-vegetation of the site. Some chemical dust suppressants may be subject to freezing and may contain solvents and should be handled properly.
- In compacted areas, watering and other liquid dust control measures may wash sediment or other constituents into the drainage system.
- If the soil surface has minimal natural moisture, the affected area may need to be pre-wetted so that chemical dust control agents can uniformly penetrate the soil surface.

## Implementation

### ***Dust Control Practices***

Dust control BMPs generally stabilize exposed surfaces and minimize activities that suspend or track dust particles. The following table presents dust control practices that can be applied to varying site conditions that could potentially cause dust. For heavily traveled and disturbed areas, wet suppression (watering), chemical dust suppression, gravel asphalt surfacing, temporary gravel construction entrances, equipment wash-out areas, and haul truck covers can be employed as dust control applications. Permanent or temporary vegetation and mulching can be employed for areas of occasional or no construction traffic. Preventive measures include minimizing surface areas to be disturbed, limiting onsite vehicle traffic to 15 mph or less, and controlling the number and activity of vehicles on a site at any given time.

Chemical dust suppressants include: mulch and fiber based dust palliatives (e.g. paper mulch with gypsum binder), salts and brines (e.g. calcium chloride, magnesium chloride), non-petroleum based organics (e.g. vegetable oil, lignosulfonate), petroleum based organics (e.g. asphalt emulsion, dust oils, petroleum resins), synthetic polymers (e.g. polyvinyl acetate, vinyls, acrylic), clay additives (e.g. bentonite, montmorillonite) and electrochemical products (e.g. enzymes, ionic products).

Site Condition	Dust Control Practices							
	Permanent Vegetation	Mulching	Wet Suppression (Watering)	Chemical Dust Suppression	Gravel or Asphalt	Temporary Gravel Construction Entrances/Equipment Wash Down	Synthetic Covers	Minimize Extent of Disturbed Area
Disturbed Areas not Subject to Traffic	X	X	X	X	X			X
Disturbed Areas Subject to Traffic			X	X	X	X		X
Material Stockpiles		X	X	X			X	X
Demolition			X			X	X	
Clearing/Excavation			X	X				X
Truck Traffic on Unpaved Roads			X	X	X	X	X	
Tracking					X	X		

Additional preventive measures include:

- Schedule construction activities to minimize exposed area (see EC-1, Scheduling).
- Quickly treat exposed soils using water, mulching, chemical dust suppressants, or stone/gravel layering.
- Identify and stabilize key access points prior to commencement of construction.
- Minimize the impact of dust by anticipating the direction of prevailing winds.
- Restrict construction traffic to stabilized roadways within the project site, as practicable.
- Water should be applied by means of pressure-type distributors or pipelines equipped with a spray system or hoses and nozzles that will ensure even distribution.
- All distribution equipment should be equipped with a positive means of shutoff.
- Unless water is applied by means of pipelines, at least one mobile unit should be available at all times to apply water or dust palliative to the project.
- If reclaimed waste water is used, the sources and discharge must meet California Department of Health Services water reclamation criteria and the Regional Water Quality

Control Board (RWQCB) requirements. Non-potable water should not be conveyed in tanks or drain pipes that will be used to convey potable water and there should be no connection between potable and non-potable supplies. Non-potable tanks, pipes, and other conveyances should be marked, "NON-POTABLE WATER - DO NOT DRINK."

- Pave or chemically stabilize access points where unpaved traffic surfaces adjoin paved roads.
- Provide covers for haul trucks transporting materials that contribute to dust.
- Provide for rapid clean up of sediments deposited on paved roads. Furnish stabilized construction road entrances and wheel wash areas.
- Stabilize inactive areas of construction sites using temporary vegetation or chemical stabilization methods.

For chemical stabilization, there are many products available for chemically stabilizing gravel roadways and stockpiles. If chemical stabilization is used, the chemicals should not create any adverse effects on stormwater, plant life, or groundwater and should meet all applicable regulatory requirements.

## Costs

Installation costs for water and chemical dust suppression vary based on the method used and the length of effectiveness. Annual costs may be high since some of these measures are effective for only a few hours to a few days.

## Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities.
- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Check areas protected to ensure coverage.
- Most water-based dust control measures require frequent application, often daily or even multiple times per day. Obtain vendor or independent information on longevity of chemical dust suppressants.

## References

Best Management Practices and Erosion Control Manual for Construction Sites, Flood Control District of Maricopa County, Arizona, September 1992.

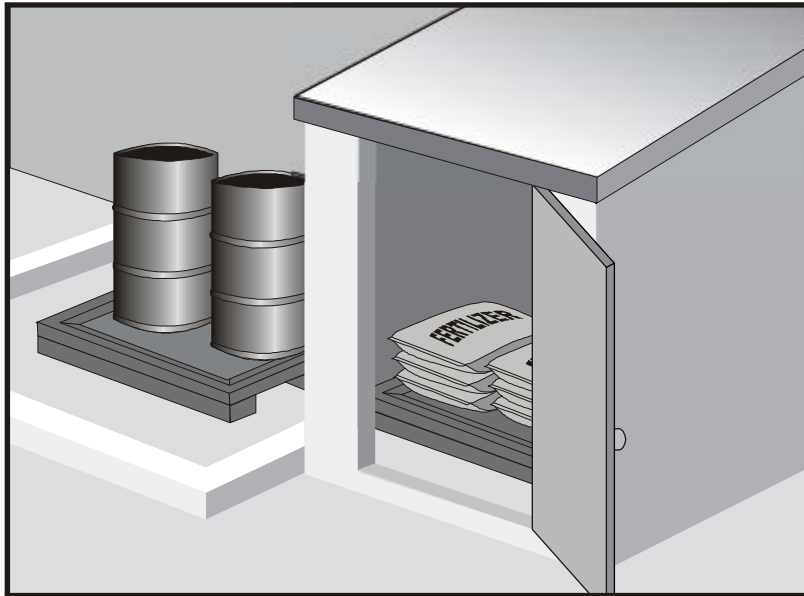
California Air Pollution Control Laws, California Air Resources Board, updated annually.

Construction Manual, Chapter 4, Section 10, "Dust Control"; Section 17, "Watering"; and Section 18, "Dust Palliative", California Department of Transportation (Caltrans), July 2001.



Prospects for Attaining the State Ambient Air Quality Standards for Suspended Particulate Matter (PM10), Visibility Reducing Particles, Sulfates, Lead, and Hydrogen Sulfide, California Air Resources Board, April 1991.

Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.



### Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	<input checked="" type="checkbox"/>

### Legend:

- Primary Category
- Secondary Category

### Description and Purpose

Prevent, reduce, or eliminate the discharge of pollutants from material delivery and storage to the stormwater system or watercourses by minimizing the storage of hazardous materials onsite, storing materials in watertight containers and/or a completely enclosed designated area, installing secondary containment, conducting regular inspections, and training employees and subcontractors.

This best management practice covers only material delivery and storage. For other information on materials, see WM-2, Material Use, or WM-4, Spill Prevention and Control. For information on wastes, see the waste management BMPs in this section.

### Suitable Applications

These procedures are suitable for use at all construction sites with delivery and storage of the following materials:

- Soil stabilizers and binders
- Pesticides and herbicides
- Fertilizers
- Detergents
- Plaster
- Petroleum products such as fuel, oil, and grease

### Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	<input checked="" type="checkbox"/>
Trash	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>
Bacteria	
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>

### Potential Alternatives

None



- Asphalt and concrete components
- Hazardous chemicals such as acids, lime, glues, adhesives, paints, solvents, and curing compounds
- Concrete compounds
- Other materials that may be detrimental if released to the environment

## Limitations

- Space limitation may preclude indoor storage.
- Storage sheds often must meet building and fire code requirements.

## Implementation

The following steps should be taken to minimize risk:

- Chemicals must be stored in water tight containers with appropriate secondary containment or in a storage shed.
- When a material storage area is located on bare soil, the area should be lined and bermed.
- Use containment pallets or other practical and available solutions, such as storing materials within newly constructed buildings or garages, to meet material storage requirements.
- Stack erodible landscape material on pallets and cover when not in use.
- Contain all fertilizers and other landscape materials when not in use.
- Temporary storage areas should be located away from vehicular traffic.
- Material Safety Data Sheets (MSDS) should be available on-site for all materials stored that have the potential to effect water quality.
- Construction site areas should be designated for material delivery and storage.
- Material delivery and storage areas should be located away from waterways, if possible.
  - Avoid transport near drainage paths or waterways.
  - Surround with earth berms or other appropriate containment BMP. See EC-9, Earth Dikes and Drainage Swales.
  - Place in an area that will be paved.
- Storage of reactive, ignitable, or flammable liquids must comply with the fire codes of your area. Contact the local Fire Marshal to review site materials, quantities, and proposed storage area to determine specific requirements. See the Flammable and Combustible Liquid Code, NFPA30.
- An up to date inventory of materials delivered and stored onsite should be kept.

- Hazardous materials storage onsite should be minimized.
- Hazardous materials should be handled as infrequently as possible.
- Keep ample spill cleanup supplies appropriate for the materials being stored. Ensure that cleanup supplies are in a conspicuous, labeled area.
- Employees and subcontractors should be trained on the proper material delivery and storage practices.
- Employees trained in emergency spill cleanup procedures must be present when dangerous materials or liquid chemicals are unloaded.
- If significant residual materials remain on the ground after construction is complete, properly remove and dispose of materials and any contaminated soil. See WM-7, Contaminated Soil Management. If the area is to be paved, pave as soon as materials are removed to stabilize the soil.

## ***Material Storage Areas and Practices***

- Liquids, petroleum products, and substances listed in 40 CFR Parts 110, 117, or 302 should be stored in approved containers and drums and should not be overfilled. Containers and drums should be placed in temporary containment facilities for storage.
- A temporary containment facility should provide for a spill containment volume able to contain precipitation from a 25 year storm event, plus the greater of 10% of the aggregate volume of all containers or 100% of the capacity of the largest container within its boundary, whichever is greater.
- A temporary containment facility should be impervious to the materials stored therein for a minimum contact time of 72 hours.
- A temporary containment facility should be maintained free of accumulated rainwater and spills. In the event of spills or leaks, accumulated rainwater and spills should be collected and placed into drums. These liquids should be handled as a hazardous waste unless testing determines them to be non-hazardous. All collected liquids or non-hazardous liquids should be sent to an approved disposal site.
- Sufficient separation should be provided between stored containers to allow for spill cleanup and emergency response access.
- Incompatible materials, such as chlorine and ammonia, should not be stored in the same temporary containment facility.
- Materials should be covered prior to, and during rain events.
- Materials should be stored in their original containers and the original product labels should be maintained in place in a legible condition. Damaged or otherwise illegible labels should be replaced immediately.

- Bagged and boxed materials should be stored on pallets and should not be allowed to accumulate on the ground. To provide protection from wind and rain throughout the rainy season, bagged and boxed materials should be covered during non-working days and prior to and during rain events.
- Stockpiles should be protected in accordance with WM-3, Stockpile Management.
- Materials should be stored indoors within existing structures or completely enclosed storage sheds when available.
- Proper storage instructions should be posted at all times in an open and conspicuous location.
- An ample supply of appropriate spill clean up material should be kept near storage areas.
- Also see WM-6, Hazardous Waste Management, for storing of hazardous wastes.

### ***Material Delivery Practices***

- Keep an accurate, up-to-date inventory of material delivered and stored onsite.
- Arrange for employees trained in emergency spill cleanup procedures to be present when dangerous materials or liquid chemicals are unloaded.

### ***Spill Cleanup***

- Contain and clean up any spill immediately.
- Properly remove and dispose of any hazardous materials or contaminated soil if significant residual materials remain on the ground after construction is complete. See WM-7, Contaminated Soil Management.
- See WM-4, Spill Prevention and Control, for spills of chemicals and/or hazardous materials.
- If spills or leaks of materials occur that are not contained and could discharge to surface waters, non-visible sampling of site discharge may be required. Refer to the General Permit or to your project specific Construction Site Monitoring Plan to determine if and where sampling is required.

### **Cost**

- The largest cost of implementation may be in the construction of a materials storage area that is covered and provides secondary containment.

### **Inspection and Maintenance**

- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Keep storage areas clean and well organized, including a current list of all materials onsite.
- Inspect labels on containers for legibility and accuracy.

- Repair or replace perimeter controls, containment structures, covers, and liners as needed to maintain proper function.

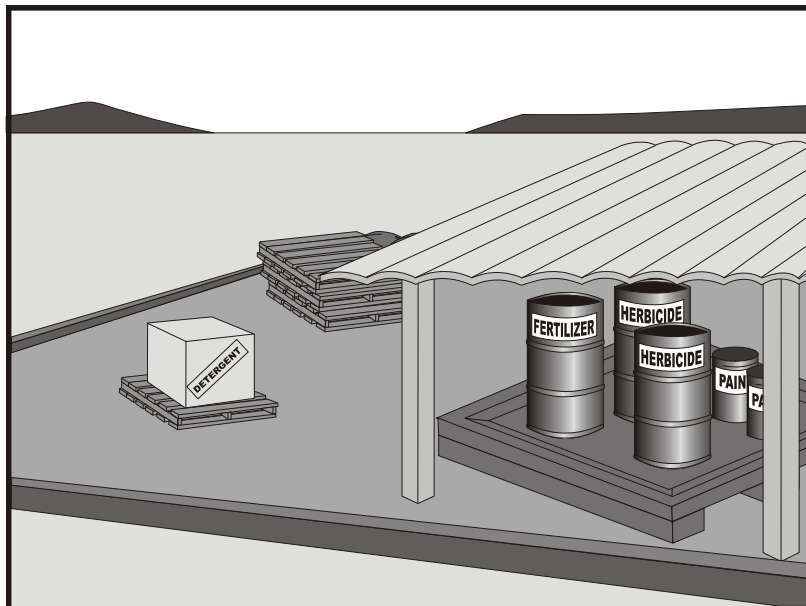
## References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance, Working Group Working Paper; USEPA, April 1992.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.

Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.



## Description and Purpose

Prevent or reduce the discharge of pollutants to the storm drain system or watercourses from material use by using alternative products, minimizing hazardous material use onsite, and training employees and subcontractors.

## Suitable Applications

This BMP is suitable for use at all construction projects. These procedures apply when the following materials are used or prepared onsite:

- Pesticides and herbicides
- Fertilizers
- Detergents
- Petroleum products such as fuel, oil, and grease
- Asphalt and other concrete components
- Other hazardous chemicals such as acids, lime, glues, adhesives, paints, solvents, and curing compounds
- Other materials that may be detrimental if released to the environment

## Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	<input checked="" type="checkbox"/>

## Legend:

- Primary Category
- Secondary Category

## Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	<input checked="" type="checkbox"/>
Trash	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>
Bacteria	
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>

## Potential Alternatives

None



## Limitations

Safer alternative building and construction products may not be available or suitable in every instance.

## Implementation

The following steps should be taken to minimize risk:

- Minimize use of hazardous materials onsite.
- Follow manufacturer instructions regarding uses, protective equipment, ventilation, flammability, and mixing of chemicals.
- Train personnel who use pesticides. The California Department of Pesticide Regulation and county agricultural commissioners license pesticide dealers, certify pesticide applicators, and conduct onsite inspections.
- The preferred method of termiticide application is soil injection near the existing or proposed structure foundation/slab; however, if not feasible, soil drench application of termiticides should follow EPA label guidelines and the following recommendations (most of which are applicable to most pesticide applications):
  - Do not treat soil that is water-saturated or frozen.
  - Application shall not commence within 24-hours of a predicted precipitation event with a 40% or greater probability. Weather tracking must be performed on a daily basis prior to termiticide application and during the period of termiticide application.
  - Do not allow treatment chemicals to runoff from the target area. Apply proper quantity to prevent excess runoff. Provide containment for and divert stormwater from application areas using berms or diversion ditches during application.
  - Dry season: Do not apply within 10 feet of storm drains. Do not apply within 25 feet of aquatic habitats (such as, but not limited to, lakes; reservoirs; rivers; permanent streams; marshes or ponds; estuaries; and commercial fish farm ponds).
  - Wet season: Do not apply within 50 feet of storm drains or aquatic habitats (such as, but not limited to, lakes; reservoirs; rivers; permanent streams; marshes or ponds; estuaries; and commercial fish farm ponds) unless a vegetative buffer is present (if so, refer to dry season requirements).
  - Do not make on-grade applications when sustained wind speeds are above 10 mph (at application site) at nozzle end height.
  - Cover treatment site prior to a rain event in order to prevent run-off of the pesticide into non-target areas. The treated area should be limited to a size that can be backfilled and/or covered by the end of the work shift. Backfilling or covering of the treated area shall be done by the end of the same work shift in which the application is made.
  - The applicator must either cover the soil him/herself or provide written notification of the above requirement to the contractor on site and to the person commissioning the



application (if different than the contractor). If notice is provided to the contractor or the person commissioning the application, then they are responsible under the Federal Insecticide Fungicide, and Rodenticide Act (FIFRA) to ensure that: 1) if the concrete slab cannot be poured over the treated soil within 24 hours of application, the treated soil is covered with a waterproof covering (such as polyethylene sheeting), and 2) the treated soil is covered if precipitation is predicted to occur before the concrete slab is scheduled to be poured.

- Do not over-apply fertilizers, herbicides, and pesticides. Prepare only the amount needed. Follow the recommended usage instructions. Over-application is expensive and environmentally harmful. Unless on steep slopes, till fertilizers into the soil rather than hydraulic application. Apply surface dressings in several smaller applications, as opposed to one large application, to allow time for infiltration and to avoid excess material being carried offsite by runoff. Do not apply these chemicals before predicted rainfall.
- Train employees and subcontractors in proper material use.
- Supply Material Safety Data Sheets (MSDS) for all materials.
- Dispose of latex paint and paint cans, used brushes, rags, absorbent materials, and drop cloths, when thoroughly dry and are no longer hazardous, with other construction debris.
- Do not remove the original product label; it contains important safety and disposal information. Use the entire product before disposing of the container.
- Mix paint indoors or in a containment area. Never clean paintbrushes or rinse paint containers into a street, gutter, storm drain, or watercourse. Dispose of any paint thinners, residue, and sludge(s) that cannot be recycled, as hazardous waste.
- For water-based paint, clean brushes to the extent practicable, and rinse to a drain leading to a sanitary sewer where permitted, or contain for proper disposal off site. For oil-based paints, clean brushes to the extent practicable, and filter and reuse thinners and solvents.
- Use recycled and less hazardous products when practical. Recycle residual paints, solvents, non-treated lumber, and other materials.
- Use materials only where and when needed to complete the construction activity. Use safer alternative materials as much as possible. Reduce or eliminate use of hazardous materials onsite when practical.
- Document the location, time, chemicals applied, and applicator's name and qualifications.
- Keep an ample supply of spill clean up material near use areas. Train employees in spill clean up procedures.
- Avoid exposing applied materials to rainfall and runoff unless sufficient time has been allowed for them to dry.
- Discontinue use of erodible landscape material within 2 days prior to a forecasted rain event and materials should be covered and/or bermed.

- Provide containment for material use areas such as masons' areas or paint mixing/preparation areas to prevent materials/pollutants from entering stormwater.

## Costs

All of the above are low cost measures.

## Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities.
- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Ensure employees and subcontractors throughout the job are using appropriate practices.

## References

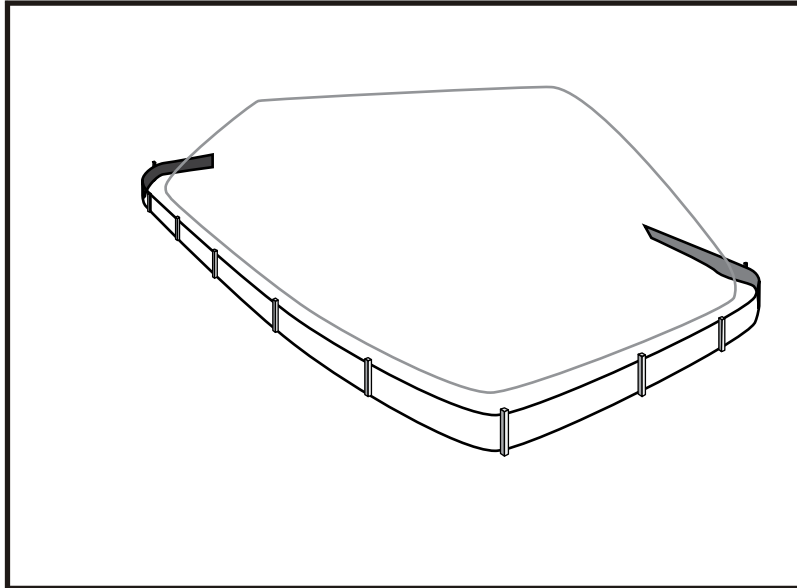
Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance, Working Group Working Paper; USEPA, April 1992.

Comments on Risk Assessments Risk Reduction Options for Cypermethrin: Docket No. OPP-2005-0293; California Stormwater Quality Association (CASQA) letter to USEPA, 2006. Environmental Hazard and General Labeling for Pyrethroid Non-Agricultural Outdoor Products, EPA-HQ-OPP-2008-0331-0021; USEPA, 2008.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.

Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.



## Categories

EC	Erosion Control	
SE	Sediment Control	<input checked="" type="checkbox"/>
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	<input checked="" type="checkbox"/>
WM	Waste Management and Materials Pollution Control	<input checked="" type="checkbox"/>

## Legend:

- Primary Category
- Secondary Category

## Description and Purpose

Stockpile management procedures and practices are designed to reduce or eliminate air and stormwater pollution from stockpiles of soil, soil amendments, sand, paving materials such as portland cement concrete (PCC) rubble, asphalt concrete (AC), asphalt concrete rubble, aggregate base, aggregate sub base or pre-mixed aggregate, asphalt minder (so called “cold mix” asphalt), and pressure treated wood.

## Suitable Applications

Implement in all projects that stockpile soil and other loose materials.

## Limitations

- Plastic sheeting as a stockpile protection is temporary and hard to manage in windy conditions. Where plastic is used, consider use of plastic tarps with nylon reinforcement which may be more durable than standard sheeting.
- Plastic sheeting can increase runoff volume due to lack of infiltration and potentially cause perimeter control failure.
- Plastic sheeting breaks down faster in sunlight.
- The use of plastic materials should be avoided when feasible and photodegradable plastics should not be used.

## Implementation

Protection of stockpiles is a year-round requirement. To properly manage stockpiles:

## Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	<input checked="" type="checkbox"/>
Trash	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>
Bacteria	
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>

## Potential Alternatives

None



- On larger sites, a minimum of 50 ft separation from concentrated flows of stormwater, drainage courses, and inlets is recommended.
- All stockpiles are required to be protected immediately if they are not scheduled to be used within 14 days.
- Protect all stockpiles from stormwater run-on using temporary perimeter sediment barriers such as compost berms (SE-13), temporary silt dikes (SE-12), fiber rolls (SE-5), silt fences (SE-1), sandbags (SE-8), gravel bags (SE-6), or biofilter bags (SE-14). Refer to the individual fact sheet for each of these controls for installation information.
- Implement wind erosion control practices as appropriate on all stockpiled material. For specific information, see WE-1, Wind Erosion Control.
- Manage stockpiles of contaminated soil in accordance with WM-7, Contaminated Soil Management.
- Place bagged materials on pallets and under cover.
- Ensure that stockpile coverings are installed securely to protect from wind and rain.
- Some plastic covers withstand weather and sunlight better than others. Select cover materials or methods based on anticipated duration of use.

## ***Protection of Non-Active Stockpiles***

Non-active stockpiles of the identified materials should be protected further as follows:

### *Soil stockpiles*

- Cover and protect soil stockpiles with soil stabilization measures and a temporary perimeter sediment barrier at all times.
- Consider temporary vegetation for topsoil piles that will be stockpiled for extended periods.

### *Stockpiles of Portland cement concrete rubble, asphalt concrete, asphalt concrete rubble, aggregate base, or aggregate sub base*

- Provide covers and protect these stockpiles with a temporary perimeter sediment barrier at all times.

### *Stockpiles of “cold mix”*

- Cover cold mix stockpiles and place them on plastic sheeting (or comparable material) and surround the stockpiles with a berm all times.

### *Stockpiles of fly ash, stucco, hydrated lime*

- Cover stockpiles of materials that may raise the pH of runoff (i.e., basic materials) with plastic and surround the stockpiles with a berm at all times.

*Stockpiles/Storage of wood (Pressure treated with chromated copper arsenate or ammoniacal copper zinc arsenate)*

- Cover treated wood with plastic sheeting (or comparable material) and surround with a berm at all times.

### **Protection of Active Stockpiles**

Active stockpiles of the identified materials should be protected as follows:

- All stockpiles should be covered and protected with a temporary linear sediment barrier prior to the onset of precipitation.
- Stockpiles of “cold mix” and treated wood, and basic materials should be placed on and covered with plastic sheeting or comparable material and surrounded by a berm prior to the onset of precipitation.
- The downstream perimeter of an active stockpile should be protected with a linear sediment barrier or berm and runoff should be diverted around or away from the stockpile on the upstream perimeter.

### **Costs**

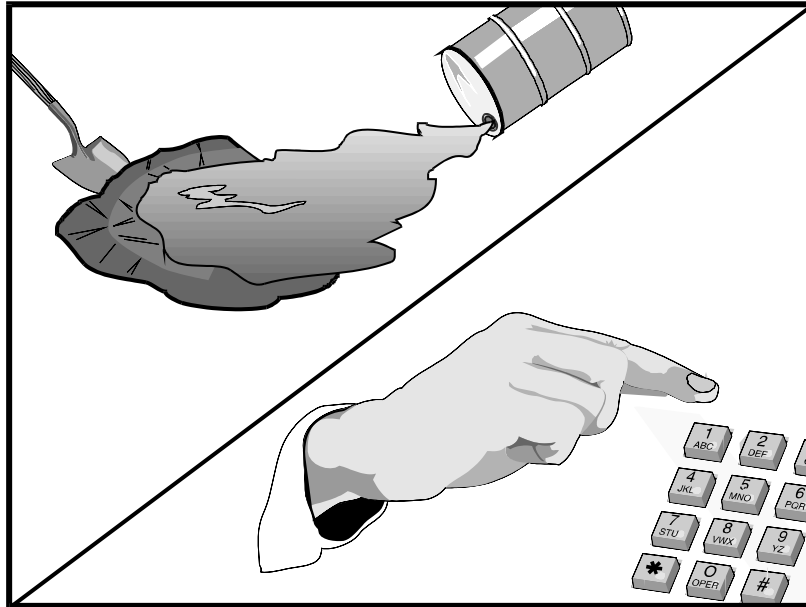
For cost information associated with stockpile protection refer to the individual erosion or sediment control BMP fact sheet considered for implementation (For example, refer to SE-1 Silt Fence for installation of silt fence around the perimeter of a stockpile.)

### **Inspection and Maintenance**

- Stockpiles must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- It may be necessary to inspect stockpiles covered with plastic sheeting more frequently during certain conditions (for example, high winds or extreme heat).
- Repair and/or replace perimeter controls and covers as needed to keep them functioning properly.
- Sediment shall be removed when it reaches one-third of the barrier height.

### **References**

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.



## Description and Purpose

Prevent or reduce the discharge of pollutants to drainage systems or watercourses from leaks and spills by reducing the chance for spills, stopping the source of spills, containing and cleaning up spills, properly disposing of spill materials, and training employees.

This best management practice covers only spill prevention and control. However, WM-1, Materials Delivery and Storage, and WM-2, Material Use, also contain useful information, particularly on spill prevention. For information on wastes, see the waste management BMPs in this section.

## Suitable Applications

This BMP is suitable for all construction projects. Spill control procedures are implemented anytime chemicals or hazardous substances are stored on the construction site, including the following materials:

- Soil stabilizers/binders
- Dust palliatives
- Herbicides
- Growth inhibitors
- Fertilizers
- Deicing/anti-icing chemicals

## Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	<input checked="" type="checkbox"/>

## Legend:

- Primary Objective
- Secondary Objective

## Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	<input checked="" type="checkbox"/>
Trash	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>
Bacteria	
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>

## Potential Alternatives

None



- Fuels
- Lubricants
- Other petroleum distillates

## **Limitations**

- In some cases it may be necessary to use a private spill cleanup company.
- This BMP applies to spills caused by the contractor and subcontractors.
- Procedures and practices presented in this BMP are general. Contractor should identify appropriate practices for the specific materials used or stored onsite

## **Implementation**

The following steps will help reduce the stormwater impacts of leaks and spills:

### ***Education***

- Be aware that different materials pollute in different amounts. Make sure that each employee knows what a “significant spill” is for each material they use, and what is the appropriate response for “significant” and “insignificant” spills.
- Educate employees and subcontractors on potential dangers to humans and the environment from spills and leaks.
- Hold regular meetings to discuss and reinforce appropriate disposal procedures (incorporate into regular safety meetings).
- Establish a continuing education program to indoctrinate new employees.
- Have contractor’s superintendent or representative oversee and enforce proper spill prevention and control measures.

### ***General Measures***

- To the extent that the work can be accomplished safely, spills of oil, petroleum products, substances listed under 40 CFR parts 110,117, and 302, and sanitary and septic wastes should be contained and cleaned up immediately.
- Store hazardous materials and wastes in covered containers and protect from vandalism.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Train employees in spill prevention and cleanup.
- Designate responsible individuals to oversee and enforce control measures.
- Spills should be covered and protected from stormwater runoff during rainfall to the extent that it doesn’t compromise clean up activities.
- Do not bury or wash spills with water.

- Store and dispose of used clean up materials, contaminated materials, and recovered spill material that is no longer suitable for the intended purpose in conformance with the provisions in applicable BMPs.
- Do not allow water used for cleaning and decontamination to enter storm drains or watercourses. Collect and dispose of contaminated water in accordance with WM-10, Liquid Waste Management.
- Contain water overflow or minor water spillage and do not allow it to discharge into drainage facilities or watercourses.
- Place proper storage, cleanup, and spill reporting instructions for hazardous materials stored or used on the project site in an open, conspicuous, and accessible location.
- Keep waste storage areas clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored. Perimeter controls, containment structures, covers, and liners should be repaired or replaced as needed to maintain proper function.

## ***Cleanup***

- Clean up leaks and spills immediately.
- Use a rag for small spills on paved surfaces, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to either a certified laundry (rags) or disposed of as hazardous waste.
- Never hose down or bury dry material spills. Clean up as much of the material as possible and dispose of properly. See the waste management BMPs in this section for specific information.

## ***Minor Spills***

- Minor spills typically involve small quantities of oil, gasoline, paint, etc. which can be controlled by the first responder at the discovery of the spill.
- Use absorbent materials on small spills rather than hosing down or burying the spill.
- Absorbent materials should be promptly removed and disposed of properly.
- Follow the practice below for a minor spill:
  - Contain the spread of the spill.
  - Recover spilled materials.
  - Clean the contaminated area and properly dispose of contaminated materials.

## ***Semi-Significant Spills***

- Semi-significant spills still can be controlled by the first responder along with the aid of other personnel such as laborers and the foreman, etc. This response may require the cessation of all other activities.



- Spills should be cleaned up immediately:
  - Contain spread of the spill.
  - Notify the project foreman immediately.
  - If the spill occurs on paved or impermeable surfaces, clean up using "dry" methods (absorbent materials, cat litter and/or rags). Contain the spill by encircling with absorbent materials and do not let the spill spread widely.
  - If the spill occurs in dirt areas, immediately contain the spill by constructing an earthen dike. Dig up and properly dispose of contaminated soil.
  - If the spill occurs during rain, cover spill with tarps or other material to prevent contaminating runoff.

### ***Significant/Hazardous Spills***

- For significant or hazardous spills that cannot be controlled by personnel in the immediate vicinity, the following steps should be taken:
  - Notify the local emergency response by dialing 911. In addition to 911, the contractor will notify the proper county officials. It is the contractor's responsibility to have all emergency phone numbers at the construction site.
  - Notify the Governor's Office of Emergency Services Warning Center, (916) 845-8911.
  - For spills of federal reportable quantities, in conformance with the requirements in 40 CFR parts 110,119, and 302, the contractor should notify the National Response Center at (800) 424-8802.
  - Notification should first be made by telephone and followed up with a written report.
  - The services of a spills contractor or a Haz-Mat team should be obtained immediately. Construction personnel should not attempt to clean up until the appropriate and qualified staffs have arrived at the job site.
  - Other agencies which may need to be consulted include, but are not limited to, the Fire Department, the Public Works Department, the Coast Guard, the Highway Patrol, the City/County Police Department, Department of Toxic Substances, California Division of Oil and Gas, Cal/OSHA, etc.

### ***Reporting***

- Report significant spills to local agencies, such as the Fire Department; they can assist in cleanup.
- Federal regulations require that any significant oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hours).

Use the following measures related to specific activities:

## ***Vehicle and Equipment Maintenance***

- If maintenance must occur onsite, use a designated area and a secondary containment, located away from drainage courses, to prevent the runoff of stormwater and the runoff of spills.
- Regularly inspect onsite vehicles and equipment for leaks and repair immediately
- Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment onsite.
- Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- Place drip pans or absorbent materials under paving equipment when not in use.
- Use absorbent materials on small spills rather than hosing down or burying the spill. Remove the absorbent materials promptly and dispose of properly.
- Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around
- Oil filters disposed of in trashcans or dumpsters can leak oil and pollute stormwater. Place the oil filter in a funnel over a waste oil-recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask the oil supplier or recycler about recycling oil filters.
- Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

## ***Vehicle and Equipment Fueling***

- If fueling must occur onsite, use designate areas, located away from drainage courses, to prevent the runoff of stormwater and the runoff of spills.
- Discourage "topping off" of fuel tanks.
- Always use secondary containment, such as a drain pan, when fueling to catch spills/ leaks.

## **Costs**

Prevention of leaks and spills is inexpensive. Treatment and/ or disposal of contaminated soil or water can be quite expensive.

## **Inspection and Maintenance**

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.

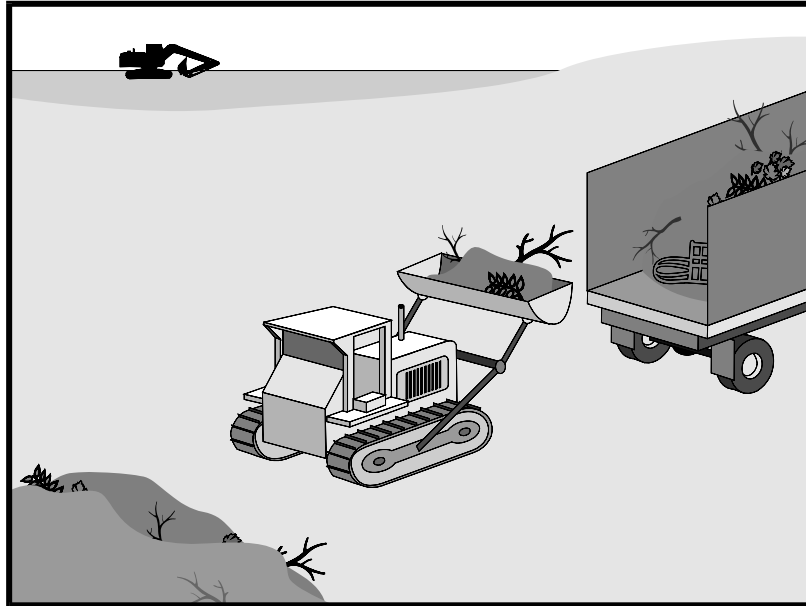
- Inspect BMPs subject to non-stormwater discharge daily while non-stormwater discharges occur.
- Keep ample supplies of spill control and cleanup materials onsite, near storage, unloading, and maintenance areas.
- Update your spill prevention and control plan and stock cleanup materials as changes occur in the types of chemicals onsite.

## References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.



## Description and Purpose

Solid waste management procedures and practices are designed to prevent or reduce the discharge of pollutants to stormwater from solid or construction waste by providing designated waste collection areas and containers, arranging for regular disposal, and training employees and subcontractors.

## Suitable Applications

This BMP is suitable for construction sites where the following wastes are generated or stored:

- Solid waste generated from trees and shrubs removed during land clearing, demolition of existing structures (rubble), and building construction
- Packaging materials including wood, paper, and plastic
- Scrap or surplus building materials including scrap metals, rubber, plastic, glass pieces, and masonry products
- Domestic wastes including food containers such as beverage cans, coffee cups, paper bags, plastic wrappers, and cigarettes
- Construction wastes including brick, mortar, timber, steel and metal scraps, pipe and electrical cuttings, non-hazardous equipment parts, styrofoam and other materials used to transport and package construction materials
- Highway planting wastes, including vegetative material,

## Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
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WM	Waste Management and Materials Pollution Control	<input checked="" type="checkbox"/>

## Legend:

- Primary Objective
- Secondary Objective

## Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	<input checked="" type="checkbox"/>
Trash	<input checked="" type="checkbox"/>
Metals	<input checked="" type="checkbox"/>
Bacteria	
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>

## Potential Alternatives

None



plant containers, and packaging materials

## Limitations

Temporary stockpiling of certain construction wastes may not necessitate stringent drainage related controls during the non-rainy season or in desert areas with low rainfall.

## Implementation

The following steps will help keep a clean site and reduce stormwater pollution:

- Select designated waste collection areas onsite.
- Inform trash-hauling contractors that you will accept only watertight dumpsters for onsite use. Inspect dumpsters for leaks and repair any dumpster that is not watertight.
- Locate containers in a covered area or in a secondary containment.
- Provide an adequate number of containers with lids or covers that can be placed over the container to keep rain out or to prevent loss of wastes when it is windy.
- Cover waste containers at the end of each work day and when it is raining.
- Plan for additional containers and more frequent pickup during the demolition phase of construction.
- Collect site trash daily, especially during rainy and windy conditions.
- Remove this solid waste promptly since erosion and sediment control devices tend to collect litter.
- Make sure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids, pesticides, additives, curing compounds) are not disposed of in dumpsters designated for construction debris.
- Do not hose out dumpsters on the construction site. Leave dumpster cleaning to the trash hauling contractor.
- Arrange for regular waste collection before containers overflow.
- Clean up immediately if a container does spill.
- Make sure that construction waste is collected, removed, and disposed of only at authorized disposal areas.

## Education

- Have the contractor's superintendent or representative oversee and enforce proper solid waste management procedures and practices.
- Instruct employees and subcontractors on identification of solid waste and hazardous waste.
- Educate employees and subcontractors on solid waste storage and disposal procedures.

- Hold regular meetings to discuss and reinforce disposal procedures (incorporate into regular safety meetings).
- Require that employees and subcontractors follow solid waste handling and storage procedures.
- Prohibit littering by employees, subcontractors, and visitors.
- Minimize production of solid waste materials wherever possible.

### ***Collection, Storage, and Disposal***

- Littering on the project site should be prohibited.
- To prevent clogging of the storm drainage system, litter and debris removal from drainage grates, trash racks, and ditch lines should be a priority.
- Trash receptacles should be provided in the contractor's yard, field trailer areas, and at locations where workers congregate for lunch and break periods.
- Litter from work areas within the construction limits of the project site should be collected and placed in watertight dumpsters at least weekly, regardless of whether the litter was generated by the contractor, the public, or others. Collected litter and debris should not be placed in or next to drain inlets, stormwater drainage systems, or watercourses.
- Dumpsters of sufficient size and number should be provided to contain the solid waste generated by the project.
- Full dumpsters should be removed from the project site and the contents should be disposed of by the trash hauling contractor.
- Construction debris and waste should be removed from the site biweekly or more frequently as needed.
- Construction material visible to the public should be stored or stacked in an orderly manner.
- Stormwater runoff should be prevented from contacting stored solid waste through the use of berms, dikes, or other temporary diversion structures or through the use of measures to elevate waste from site surfaces.
- Solid waste storage areas should be located at least 50 ft from drainage facilities and watercourses and should not be located in areas prone to flooding or ponding.
- Except during fair weather, construction and highway planting waste not stored in watertight dumpsters should be securely covered from wind and rain by covering the waste with tarps or plastic.
- Segregate potentially hazardous waste from non-hazardous construction site waste.
- Make sure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids, pesticides, additives, curing compounds) are not disposed of in dumpsters designated for construction debris.

- For disposal of hazardous waste, see WM-6, Hazardous Waste Management. Have hazardous waste hauled to an appropriate disposal and/or recycling facility.
- Salvage or recycle useful vegetation debris, packaging and surplus building materials when practical. For example, trees and shrubs from land clearing can be used as a brush barrier, or converted into wood chips, then used as mulch on graded areas. Wood pallets, cardboard boxes, and construction scraps can also be recycled.

## Costs

All of the above are low cost measures.

## Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect BMPs in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Inspect BMPs subject to non-stormwater discharge daily while non-stormwater discharges occur
- Inspect construction waste area regularly.
- Arrange for regular waste collection.

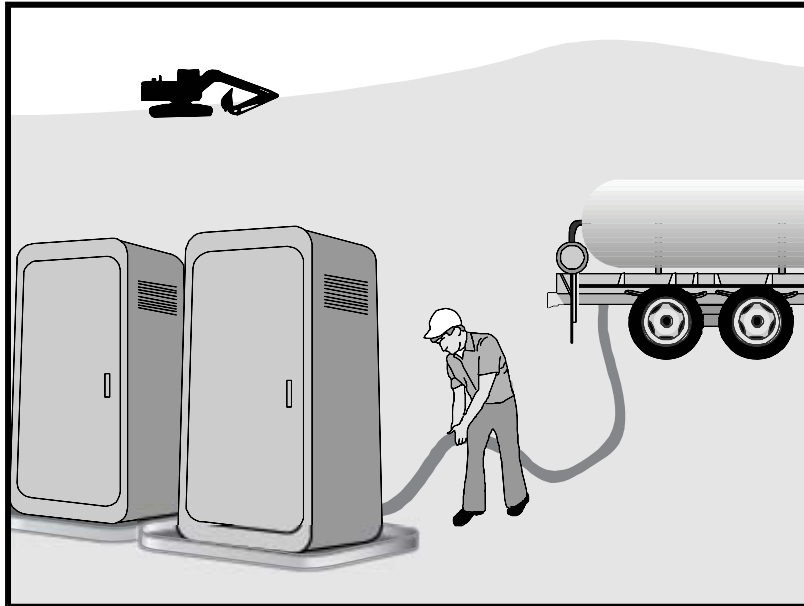
## References

Processes, Procedures and Methods to Control Pollution Resulting from All Construction Activity, 430/9-73-007, USEPA, 1973.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.

# Sanitary/Septic Waste Management WM-9



## Description and Purpose

Proper sanitary and septic waste management prevent the discharge of pollutants to stormwater from sanitary and septic waste by providing convenient, well-maintained facilities, and arranging for regular service and disposal.

## Suitable Applications

Sanitary septic waste management practices are suitable for use at all construction sites that use temporary or portable sanitary and septic waste systems.

## Limitations

None identified.

## Implementation

Sanitary or septic wastes should be treated or disposed of in accordance with state and local requirements. In many cases, one contract with a local facility supplier will be all that it takes to make sure sanitary wastes are properly disposed.

## Storage and Disposal Procedures

- Temporary sanitary facilities should be located away from drainage facilities, watercourses, and from traffic circulation. If site conditions allow, place portable facilities a minimum of 50 feet from drainage conveyances and traffic areas. When subjected to high winds or risk of high winds, temporary sanitary facilities should be secured to prevent overturning.

## Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	<input checked="" type="checkbox"/>

## Legend:

- Primary Category
- Secondary Category

## Targeted Constituents

Sediment	
Nutrients	<input checked="" type="checkbox"/>
Trash	<input checked="" type="checkbox"/>
Metals	
Bacteria	<input checked="" type="checkbox"/>
Oil and Grease	
Organics	<input checked="" type="checkbox"/>

## Potential Alternatives

None





# Sanitary/Septic Waste Management WM-9

---

- Temporary sanitary facilities must be equipped with containment to prevent discharge of pollutants to the stormwater drainage system of the receiving water.
- Consider safety as well as environmental implications before placing temporary sanitary facilities.
- Wastewater should not be discharged or buried within the project site.
- Sanitary and septic systems that discharge directly into sanitary sewer systems, where permissible, should comply with the local health agency, city, county, and sewer district requirements.
- Only reputable, licensed sanitary and septic waste haulers should be used.
- Sanitary facilities should be located in a convenient location.
- Temporary septic systems should treat wastes to appropriate levels before discharging.
- If using an onsite disposal system (OSDS), such as a septic system, local health agency requirements must be followed.
- Temporary sanitary facilities that discharge to the sanitary sewer system should be properly connected to avoid illicit discharges.
- Sanitary and septic facilities should be maintained in good working order by a licensed service.
- Regular waste collection by a licensed hauler should be arranged before facilities overflow.
- If a spill does occur from a temporary sanitary facility, follow federal, state and local regulations for containment and clean-up.

## ***Education***

- Educate employees, subcontractors, and suppliers on sanitary and septic waste storage and disposal procedures.
- Educate employees, subcontractors, and suppliers of potential dangers to humans and the environment from sanitary and septic wastes.
- Instruct employees, subcontractors, and suppliers in identification of sanitary and septic waste.
- Hold regular meetings to discuss and reinforce the use of sanitary facilities (incorporate into regular safety meetings).
- Establish a continuing education program to indoctrinate new employees.

## **Costs**

All of the above are low cost measures.

# **Sanitary/Septic Waste Management WM-9**

---

## **Inspection and Maintenance**

- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Arrange for regular waste collection.
- If high winds are expected, portable sanitary facilities must be secured with spikes or weighed down to prevent over turning.
- If spills or leaks from sanitary or septic facilities occur that are not contained and discharge from the site, non-visible sampling of site discharge may be required. Refer to the General Permit or to your project specific Construction Site Monitoring Plan to determine if and where sampling is required.

## **References**

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.

Stormwater Management for Construction Activities; Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92005; USEPA, April 1992.



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**APPENDIX I**

BMP Inspection Form



## BMP INSPECTION REPORT

Date and Time of Inspection:		Date Report Written:		
Inspection Type: (Circle one)	Weekly <i>Complete Parts I, II, III and VII</i>	Pre-Storm <i>Complete Parts I, II, III, IV and VII</i>	During Rain Event <i>Complete Parts I, II, III, V, and VII</i>	Post-Storm <i>Complete Parts I, II, III, VI and VII</i>
<b>Part I. General Information</b>				
<b>Site Information</b>				
Construction Site Name: Keeler Dunes Risk Level 1				
Construction stage and completed activities:			Approximate area of site that is exposed:	
Photos Taken: (Circle one)	Yes	No	Photo Reference IDs:	
<b>Weather</b>				
Estimate storm beginning: (date and time)		Estimate storm duration: (hours)		
Estimate time since last storm: (days or hours)		Rain gauge reading and location: (in)		
Is a "Qualifying Event" predicted or did one occur (i.e., 0.5" rain with 48-hrs or greater between events)? (Y/N) If yes, summarize forecast:				
Exemption Documentation (explanation required if inspection could not be conducted). Visual inspections are not required outside of business hours or during dangerous weather conditions such as flooding or electrical storms.				
<b>Inspector Information</b>				
Inspector Name:			Inspector Title:	
Signature:			Date:	

<b>Part II. BMP Observations. Describe deficiencies in Part III.</b>			
<b>Minimum BMPs for Risk Level 1 Sites</b>	<b>Failures or other short comings (yes, no, N/A)</b>	<b>Action Required (yes/no)</b>	<b>Action Implemented (Date)</b>
<b>Good Housekeeping for Construction Materials</b>			
Inventory of products (excluding materials designed to be outdoors)			
Stockpiled construction materials not actively in use are covered and bermed			
All chemicals are stored in watertight containers with appropriate secondary containment, or in a completely enclosed storage shed			
Construction materials are minimally exposed to precipitation			
BMPs preventing the off-site tracking of materials are implemented and properly effective			
<b>Good Housekeeping for Waste Management</b>			
Wash/rinse water and materials are prevented from being disposed into the storm drain system			
Portable toilets are contained to prevent discharges of waste			
Sanitation facilities are clean and with no apparent for leaks and spills			
Equipment is in place to cover waste disposal containers at the end of business day and during rain events			
Discharges from waste disposal containers are prevented from discharging to the storm drain system / receiving water			
Stockpiled waste material is securely protected from wind and rain if not actively in use			
Procedures are in place for addressing hazardous and non-hazardous spills			
Appropriate spill response personnel are assigned and trained			
Equipment and materials for cleanup of spills is available onsite			
Washout areas (e.g., concrete) are contained appropriately to prevent discharge or infiltration into the underlying soil			
<b>Good Housekeeping for Vehicle Storage and Maintenance</b>			
Measures are in place to prevent oil, grease, or fuel from leaking into the ground, storm drains, or surface waters			
All equipment or vehicles are fueled, maintained, and stored in a designated area with appropriate BMPs			
Vehicle and equipment leaks are cleaned immediately and disposed of properly			

<b>Part II. BMP Observations Continued. Describe deficiencies in Part III.</b>			
<b>Minimum BMPs for Risk Level 1 Sites</b>	Adequately designed, implemented and effective (yes, no, N/A)	Action Required (yes/no)	Action Implemented (Date)
<b>Good Housekeeping for Landscape Materials</b>			
Stockpiled landscape materials such as mulches and topsoil are contained and covered when not actively in use			
Erodible landscape material has not been applied 2 days before a forecasted rain event or during an event			
Erodible landscape materials are applied at quantities and rates in accordance with manufacturer recommendations			
Bagged erodible landscape materials are stored on pallets and covered			
<b>Good Housekeeping for Air Deposition of Site Materials</b>			
Good housekeeping measures are implemented onsite to control the air deposition of site materials and from site operations			
<b>Non-Stormwater Management</b>			
Non-Stormwater discharges are properly controlled			
Vehicles are washed in a manner to prevent non-stormwater discharges to surface waters or drainage systems			
Streets are cleaned in a manner to prevent unauthorized non-stormwater discharges to surface waters or drainage systems.			
<b>Erosion Controls</b>			
Wind erosion controls are effectively implemented			
Effective soil cover is provided for disturbed areas inactive (i.e., not scheduled to be disturbed for 14 days) as well as finished slopes, open space, utility backfill, and completed lots			
The use of plastic materials is limited in cases when a more sustainable, environmentally friendly alternative exists.			
<b>Sediment Controls</b>			
Perimeter controls are established and effective at controlling erosion and sediment discharges from the site			
Entrances and exits are stabilized to control erosion and sediment discharges from the site			
Sediment basins are properly maintained			
<b>Run-On and Run-Off Controls</b>			
Run-on to the site is effectively managed and directed away from all disturbed areas.			

Other			
Are the project SWPPP and BMP plan up to date, available on-site and being properly implemented?			

Part III. Descriptions of BMP Deficiencies		
Deficiency	Repairs Implemented: Note - Repairs must begin within 72 hours of identification and, complete repairs as soon as possible.	
	Start Date	Action
1.		
2.		
3.		
4.		

Part IV. Additional Pre-Storm Observations. Note the presence or absence of floating and suspended materials, sheen, discoloration, turbidity, odors, and source(s) of pollutants(s).	
	Yes, No, N/A
Do stormwater storage and containment areas have adequate freeboard? If no, complete Part III.	
Are drainage areas free of spills, leaks, or uncontrolled pollutant sources? If no, complete Part VII and describe below.	
Notes:	
Are stormwater storage and containment areas free of leaks? If no, complete Parts III and/or VII and describe below.	
Notes:	

<b>Part V. Additional During Storm Observations. If BMPs cannot be inspected during inclement weather, list the results of visual inspections at all relevant outfalls, discharge points, and downstream locations. Note odors or visible sheen on the surface of discharges. Complete Part VII (Corrective Actions) as needed.</b>	
Outfall, Discharge Point, or Other Downstream Location	
Location	Description
Location	Description
Location	Description
Location	Description
Location	Description
Location	Description
Location	Description
Location	Description
Location	Description



<b>Part VI. Additional Post-Storm Observations.</b> Visually observe (inspect) stormwater discharges at all discharge locations within two business days (48 hours) after each qualifying rain event, and observe (inspect) the discharge of stored or contained stormwater that is derived from and discharged subsequent to a qualifying rain event producing precipitation of ½ inch or more at the time of discharge. Complete Part VII (Corrective Actions) as needed.	
Discharge Location, Storage or Containment Area	Visual Observation

<b>Part VII. Additional Corrective Actions Required.</b> Identify additional corrective actions not included with BMP Deficiencies (Part III) above. Note if SWPPP change is required.	
Required Actions	Implementation Date

---

**APPENDIX J**

Project Qualified Storm water Pollution Prevention Plan Practitioner



## IDENTIFICATION OF QSP

Project Name: Keeler Dunes

WDID #: \_\_\_\_\_

The following are QSPs associated with this project

Name of Personnel <sup>(1)</sup>	Company	Date
Jim Honniball QSD/QSP	AMEC	
David Allbut, QSP	AMEC	
Hailey Young, QSP	AMEC	

(1) If additional QSPs are required on the job site add additional lines and include information here



---

**APPENDIX K**

Training Reporting Form



**TRAINED CONTRACTOR PERSONNEL LOG**  
**Storm Water Management Training Log and Documentation**

Project Name: Keeler Dunes

WDID #: \_\_\_\_\_

Storm Water Management Topic: (check as appropriate)

- |   |   |
|---|---|
| <input type="checkbox"/> Erosion Control            | <input type="checkbox"/> Sediment Control                                 |
| <input type="checkbox"/> Wind Erosion Control       | <input type="checkbox"/> Tracking Control                                 |
| <input type="checkbox"/> Non-Storm Water Management | <input type="checkbox"/> Waste Management and Materials Pollution Control |
| <input type="checkbox"/> Storm Water Sampling       |   |

Specific Training Objective: \_\_\_\_\_

Location: \_\_\_\_\_

Date: \_\_\_\_\_

Instructor: \_\_\_\_\_

Telephone: \_\_\_\_\_

Course Length (hours): \_\_\_\_\_

**Attendee Roster (Attach additional forms if necessary)**

Name	Company	Phone

As needed, add proof of external training (e.g., course completion certificates, credentials for QSP, QSD).

---

**APPENDIX L**

Responsible Parties and Approved Signatories



## AUTHORIZATION OF APPROVED SIGNATORIES

Project Name: Keeler Dunes

WDID #: \_\_\_\_\_

Name of Personnel	Project Role	Company	Signature	Date

\_\_\_\_\_  
LRP's Signature

\_\_\_\_\_  
Date

Great Basin Unified Air Pollution Control District

LRP Name and Title

\_\_\_\_\_  
Telephone Number

---

**APPENDIX M**

Contractors and Subcontractors





### CONTRACTORS AND SUBCONTRACTORS

Project Name: Keeler Dunes

<b>Contractor or Subcontractor Company Name</b>	<b>Contact Name</b>	<b>Address</b>	<b>Office Phone Number</b>	<b>Cell Phone Number</b>	<b>Type of Work</b>

---

**APPENDIX N**

Construction General Permit (not applicable sections removed)



Linda S. Adams  
Secretary for  
Environmental Protection

# State Water Resources Control Board



Arnold Schwarzenegger  
Governor

## Division of Water Quality

1001 I Street • Sacramento, California 95814 • (916) 341-5455  
Mailing Address: P.O. Box 100 • Sacramento, California • 95812-0100  
Fax (916) 341-5463 • <http://www.waterboards.ca.gov>

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)  
GENERAL PERMIT FOR  
STORM WATER DISCHARGES  
ASSOCIATED WITH CONSTRUCTION AND LAND DISTURBANCE  
ACTIVITIES

ORDER NO. 2009-0009-DWQ  
NPDES NO. **CAS000002**

This Order was adopted by the State Water Resources Control Board on:	<b>September 2, 2009</b>
This Order shall become effective on:	<b>July 1, 2010</b>
This Order shall expire on:	<b>September 2, 2014</b>

IT IS HEREBY ORDERED, that this Order supersedes Order No. 99-08-DWQ [as amended by Order No. 2010-0014-DWQ] except for enforcement purposes. The Discharger shall comply with the requirements in this Order to meet the provisions contained in Division 7 of the California Water Code (commencing with section 13000) and regulations adopted thereunder, and the provisions of the federal Clean Water Act and regulations and guidelines adopted thereunder.

I, Jeanine Townsend, Clerk to the Board, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the State Water Resources Control Board, on September 2, 2009.

AYE: Vice Chair Frances Spivy-Weber  
Board Member Arthur G. Baggett, Jr.  
Board Member Tam M. Doduc

NAY: Chairman Charles R. Hoppin

ABSENT: None

ABSTAIN: None

Jeanine Townsend  
Clerk to the Board



Linda S. Adams  
Secretary for  
Environmental Protection

# State Water Resources Control Board



Arnold Schwarzenegger  
Governor

## Division of Water Quality

1001 I Street • Sacramento, California 95814 • (916) 341-5455  
Mailing Address: P.O. Box 100 • Sacramento, California • 95812-0100  
Fax (916) 341-5463 • <http://www.waterboards.ca.gov>

### NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION AND LAND DISTURBANCE ACTIVITIES

**ORDER NO. 2010-0014-DWQ  
NPDES NO. CAS000002**

Order No. 2009-0009-DWQ was adopted by the State Water Resources Control Board on:	<b>September 2, 2009</b>
Order No. 2009-0009-DWQ became effective on:	<b>July 1, 2010</b>
Order No. 2009-0009-DWQ shall expire on:	<b>September 2, 2014</b>
This Order, which amends Order No. 2009-0009-DWQ, was adopted by the State Water Resources Control Board on:	<b>November 16, 2010</b>
This Order shall become effective on:	<b>February 14, 2011</b>

IT IS HEREBY ORDERED that this Order amends Order No. 2009-0009-DWQ. Additions to Order No. 2009-0009-DWQ are reflected in [blue-underline](#) text and deletions are reflected in ~~red-strikeout~~ text.

IT IS FURTHER ORDERED that staff are directed to prepare and post a conformed copy of Order No. 2009-0009-DWQ incorporating the revisions made by this Order.

I, Jeanine Townsend, Clerk to the Board, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the State Water Resources Control Board, on **November 16, 2010**.

AYE: Chairman Charles R. Hoppin  
Vice Chair Frances Spivy-Weber  
Board Member Arthur G. Baggett, Jr.  
Board Member Tam M. Doduc

NAY: None

ABSENT: None

ABSTAIN: None

Jeanine Townsend  
Clerk to the Board



State Water Resources Control Board

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
GENERAL PERMIT FOR
STORM WATER DISCHARGES
ASSOCIATED WITH CONSTRUCTION AND LAND DISTURBANCE ACTIVITIES

ORDER NO. 2012-0006-DWQ
NPDES NO. CAS000002

Table with 2 columns: Description of order changes and Effective dates. Rows include adoption of 2009-0009-DWQ, effectiveness of 2009-0009-DWQ, effectiveness of 2010-0014-DWQ, expiration of 2009-0009-DWQ as amended, adoption of the current order, and effectiveness of the current order.

IT IS HEREBY ORDERED that this Order amends Order No. 2009-0009-DWQ. Additions to Order No. 2009-0009-DWQ are reflected in blue-underline text and deletions are reflected in red-strikeout text.

IT IS FURTHER ORDERED that staff are directed to prepare and post a conformed copy of Order No. 2009-000-DWQ incorporating the revisions made by this Order.

I, Jeanine Townsend, Clerk to the Board, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the State Water Resources Control Board, on July 17, 2012.

AYE: Chairman Charles R. Hoppin
Vice Chair Frances Spivy-Weber
Board Member Tam M. Doduc
Board Member Steven Moore
Board Member Felicia Marcus

NAY: None

ABSENT: None

ABSTAIN: None

Handwritten signature of Jeanine Townsend
Jeanine Townsend
Clerk to the Board

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## LIST OF ATTACHMENTS

Attachment A – Linear Underground/Overhead Requirements  
Attachment A.1 – LUP Type Determination  
Attachment A.2 – LUP Permit Registration Documents  
Attachment B – Permit Registration Documents  
Attachment C – Risk Level 1 Requirements  
Attachment D – Risk Level 2 Requirements  
Attachment E – Risk Level 3 Requirements  
Attachment F – Active Treatment System (ATS) Requirements

## LIST OF APPENDICES

Appendix 1 – Risk Determination Worksheet  
Appendix 2 – Post-Construction Water Balance Performance Standard  
Appendix 2.1 – Post-Construction Water Balance Performance Standard Spreadsheet  
Appendix 3 – Bioassessment Monitoring Guidelines  
Appendix 4 – Adopted/Implemented Sediment TMDLs  
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**STATE WATER RESOURCES CONTROL BOARD  
ORDER NO. 2009-0009-DWQ  
[AS AMENDED BY ORDER NO. 2010-0014-DWQ]  
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM  
GENERAL PERMIT NO. CAS000002**

**WASTE DISCHARGE REQUIREMENTS  
FOR  
DISCHARGES OF STORM WATER RUNOFF ASSOCIATED WITH  
CONSTRUCTION AND LAND DISTURBANCE ACTIVITIES**

**I. FINDINGS**

**A. General Findings**

The State Water Resources Control Board (State Water Board) finds that:

1. The federal Clean Water Act (CWA) prohibits certain discharges of storm water containing pollutants except in compliance with a National Pollutant Discharge Elimination System (NPDES) permit (Title 33 United States Code (U.S.C.) §§ 1311 and 1342(p); also referred to as Clean Water Act (CWA) §§ 301 and 402(p)). The U.S. Environmental Protection Agency (U.S. EPA) promulgates federal regulations to implement the CWA's mandate to control pollutants in storm water runoff discharges. (Title 40 Code of Federal Regulations (C.F.R.) Parts 122, 123, and 124). The federal statutes and regulations require discharges to surface waters comprised of storm water associated with construction activity, including demolition, clearing, grading, and excavation, and other land disturbance activities (except operations that result in disturbance of less than one acre of total land area and which are not part of a larger common plan of development or sale), to obtain coverage under an NPDES permit. The NPDES permit must require implementation of Best Available Technology Economically Achievable (BAT) and Best Conventional Pollutant Control Technology (BCT) to reduce or eliminate pollutants in storm water runoff. The NPDES permit must also include additional requirements necessary to implement applicable water quality standards.
2. This General Permit authorizes discharges of storm water associated with construction activity so long as the dischargers comply with all requirements, provisions, limitations and prohibitions in the permit. In addition, this General Permit regulates the discharges of storm water associated with construction activities from all Linear

Underground/Overhead Projects resulting in the disturbance of greater than or equal to one acre (Attachment A).

3. This General Permit regulates discharges of pollutants in storm water associated with construction activity (storm water discharges) to waters of the United States from construction sites that disturb one or more acres of land surface, or that are part of a common plan of development or sale that disturbs more than one acre of land surface.
4. This General Permit does not preempt or supersede the authority of local storm water management agencies to prohibit, restrict, or control storm water discharges to municipal separate storm sewer systems or other watercourses within their jurisdictions.
5. This action to adopt a general NPDES permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code Section 21100, et seq.), pursuant to Section 13389 of the California Water Code.
6. Pursuant to 40 C.F.R. § 131.12 and State Water Board [Resolution No. 68-16](#),<sup>1</sup> which incorporates the requirements of § 131.12 where applicable, the State Water Board finds that discharges in compliance with this General Permit will not result in the lowering of water quality standards, and are therefore consistent with those provisions. Compliance with this General Permit will result in improvements in water quality.
7. This General Permit serves as an NPDES permit in compliance with CWA § 402 and will take effect on July 1, 2010 by the State Water Board provided the Regional Administrator of the U.S. EPA has no objection. If the U.S. EPA Regional Administrator objects to its issuance, the General Permit will not become effective until such objection is withdrawn.
8. Following adoption and upon the effective date of this General Permit, the Regional Water Quality Control Boards (Regional Water Boards) shall enforce the provisions herein.
9. Regional Water Boards establish water quality standards in Basin Plans. The State Water Board establishes water quality standards in various statewide plans, including the California Ocean Plan. U.S. EPA establishes water quality standards in the National Toxic Rule (NTR) and the California Toxic Rule (CTR).

---

<sup>1</sup> Resolution No. 68-16 generally requires that existing water quality be maintained unless degradation is justified based on specific findings.



10. This General Permit does not authorize discharges of fill or dredged material regulated by the U.S. Army Corps of Engineers under CWA § 404 and does not constitute a waiver of water quality certification under CWA § 401.
11. The primary storm water pollutant at construction sites is excess sediment. Excess sediment can cloud the water, which reduces the amount of sunlight reaching aquatic plants, clog fish gills, smother aquatic habitat and spawning areas, and impede navigation in our waterways. Sediment also transports other pollutants such as nutrients, metals, and oils and greases.
12. Construction activities can impact a construction site's runoff sediment supply and transport characteristics. These modifications, which can occur both during and after the construction phase, are a significant cause of degradation of the beneficial uses established for water bodies in California. Dischargers can avoid these effects through better construction site design and activity practices.
13. This General Permit recognizes four distinct phases of construction activities. The phases are Grading and Land Development Phase, Streets and Utilities Phase, Vertical Construction Phase, and Final Landscaping and Site Stabilization Phase. Each phase has activities that can result in different water quality effects from different water quality pollutants. This General Permit also recognizes inactive construction as a category of construction site type.
14. Compliance with any specific limits or requirements contained in this General Permit does not constitute compliance with any other applicable requirements.
15. Following public notice in accordance with State and Federal laws and regulations, the State Water Board heard and considered all comments and testimony in a public hearing on 06/03/2009. The State Water Board has prepared written responses to all significant comments.
16. Construction activities obtaining coverage under the General Permit may have multiple discharges subject to requirements that are specific to general, linear, and/or active treatment system discharge types.
17. The State Water Board may reopen the permit if the U.S. EPA adopts a final effluent limitation guideline for construction activities.

## **B. Activities Covered Under the General Permit**

18. Any construction or demolition activity, including, but not limited to, clearing, grading, grubbing, or excavation, or any other activity that results in a land disturbance of equal to or greater than one acre.
19. Construction activity that results in land surface disturbances of less than one acre if the construction activity is part of a larger common plan of development or the sale of one or more acres of disturbed land surface.
20. Construction activity related to residential, commercial, or industrial development on lands currently used for agriculture including, but not limited to, the construction of buildings related to agriculture that are considered industrial pursuant to U.S. EPA regulations, such as dairy barns or food processing facilities.
21. Construction activity associated with Linear Underground/Overhead Utility Projects (LUPs) including, but not limited to, those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities) and include, but are not limited to, underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/or pavement repair or replacement, and stockpile/borrow locations.
22. Discharges of sediment from construction activities associated with oil and gas exploration, production, processing, or treatment operations or transmission facilities.<sup>2</sup>
23. Storm water discharges from dredge spoil placement that occur outside of U.S. Army Corps of Engineers jurisdiction (upland sites) and that disturb one or more acres of land surface from construction activity are covered by this General Permit. Construction sites that intend to disturb one or more acres of land within the jurisdictional boundaries of

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<sup>2</sup> Pursuant to the Ninth Circuit Court of Appeals' decision in *NRDC v. EPA* (9th Cir. 2008) 526 F.3d 591, and subsequent denial of the U.S. EPA's petition for reconsideration in November 2008, oil and gas construction activities discharging storm water contaminated only with sediment are no longer exempt from the NPDES program.

a CWA § 404 permit should contact the appropriate Regional Water Board to determine whether this permit applies to the site.

**C. Activities Not Covered Under the General Permit**

24. Routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility.
25. Disturbances to land surfaces solely related to agricultural operations such as disking, harrowing, terracing and leveling, and soil preparation.
26. Discharges of storm water from areas on tribal lands; construction on tribal lands is regulated by a federal permit.
27. Construction activity and land disturbance involving discharges of storm water within the Lake Tahoe Hydrologic Unit. The Lahontan Regional Water Board has adopted its own permit to regulate storm water discharges from construction activity in the Lake Tahoe Hydrologic Unit (Regional Water Board 6SLT). Owners of construction sites in this watershed must apply for the Lahontan Regional Water Board permit rather than the statewide Construction General Permit.
28. Construction activity that disturbs less than one acre of land surface, and that is not part of a larger common plan of development or the sale of one or more acres of disturbed land surface.
29. Construction activity covered by an individual NPDES Permit for storm water discharges.
30. Discharges from small (1 to 5 acre) construction activities with an approved Rainfall Erosivity Waiver authorized by U.S. EPA Phase II regulations certifying to the State Board that small construction activity will occur only when the Rainfall Erosivity Factor is less than 5 ("R" in the Revised Universal Soil Loss Equation).
31. Landfill construction activity that is subject to the Industrial General Permit.
32. Construction activity that discharges to Combined Sewer Systems.
33. Conveyances that discharge storm water runoff combined with municipal sewage.
34. Discharges of storm water identified in CWA § 402(l)(2), 33 U.S.C. § 1342(l)(2).

35. Discharges occurring in basins that are not tributary or hydrologically connected to waters of the United States (for more information contact your Regional Water Board).

#### **D. Obtaining and Modifying General Permit Coverage**

36. This General Permit requires all dischargers to electronically file all Permit Registration Documents (PRDs), Notices of Termination (NOT), changes of information, annual reporting, and other compliance documents required by this General Permit through the State Water Board's Storm water Multi-Application and Report Tracking System (SMARTS) website.
37. Any information provided to the Regional Water Board shall comply with the Homeland Security Act and any other federal law that concerns security in the United States; any information that does not comply should not be submitted.
38. This General Permit grants an exception from the Risk Determination requirements for existing sites covered under Water Quality Orders No. 99-08-DWQ, and [No. 2003-0007-DWQ](#). For certain sites, adding additional requirements may not be cost effective. Construction sites covered under Water Quality Order No. 99-08-DWQ shall obtain permit coverage at the Risk Level 1. LUPs covered under Water Quality Order No. 2003-0007-DWQ shall obtain permit coverage as a Type 1 LUP. The Regional Water Boards have the authority to require Risk Determination to be performed on sites currently covered under Water Quality Orders No. 99-08-DWQ and No. 2003-0007-DWQ where they deem it necessary. The State Water Board finds that there are two circumstances when it may be appropriate for the Regional Water Boards to require a discharger that had filed an NOI under State Water Board Order No. 99-08-DWQ to recalculate the site's risk level. These circumstances are: (1) when the discharger has a demonstrated history of noncompliance with State Water Board Order No. 99-08-DWQ or; (2) when the discharger's site poses a significant risk of causing or contributing to an exceedance of a water quality standard without the implementation of the additional Risk Level 2 or 3 requirements.

#### **E. Prohibitions**

39. All discharges are prohibited except for the storm water and non-storm water discharges specifically authorized by this General Permit or another NPDES permit. Non-storm water discharges include a wide variety of sources, including improper dumping, spills, or leakage from storage tanks or transfer areas. Non-storm water discharges may

contribute significant pollutant loads to receiving waters. Measures to control spills, leakage, and dumping, and to prevent illicit connections during construction must be addressed through structural as well as non-structural Best Management Practices (BMPs)<sup>3</sup>. The State Water Board recognizes, however, that certain non-storm water discharges may be necessary for the completion of construction.

40. This General Permit prohibits all discharges which contain a hazardous substance in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.
41. This General Permit incorporates discharge prohibitions contained in water quality control plans, as implemented by the State Water Board and the nine Regional Water Boards.
42. Pursuant to the Ocean Plan, discharges to Areas of Special Biological Significance (ASBS) are prohibited unless covered by an exception that the State Water Board has approved.
43. This General Permit prohibits the discharge of any debris<sup>4</sup> from construction sites. Plastic and other trash materials can cause negative impacts to receiving water beneficial uses. The State Water Board encourages the use of more environmentally safe, biodegradable materials on construction sites to minimize the potential risk to water quality.

## **F. Training**

44. In order to improve compliance with and to maintain consistent enforcement of this General Permit, all dischargers are required to appoint two positions - the Qualified SWPPP Developer (QSD) and the Qualified SWPPP Practitioner (QSP) - who must obtain appropriate training. Together with the key stakeholders, the State and Regional Water Boards are leading the development of this curriculum through a collaborative organization called The Construction General Permit (CGP) Training Team.
45. The Professional Engineers Act (Bus. & Prof. Code section 6700, et seq.) requires that all engineering work must be performed by a California licensed engineer.

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<sup>3</sup> BMPs are scheduling of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants to waters of the United States. BMPs also include treatment requirements, operating procedures, and practice to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

<sup>4</sup> Litter, rubble, discarded refuse, and remains of destroyed inorganic anthropogenic waste.

## G. Determining and Reducing Risk

46. The risk of accelerated erosion and sedimentation from wind and water depends on a number of factors, including proximity to receiving water bodies, climate, topography, and soil type.
47. This General Permit requires dischargers to assess the risk level of a site based on both sediment transport and receiving water risk. This General Permit contains requirements for Risk Levels 1, 2 and 3, and LUP Risk Type 1, 2, and 3 (Attachment A). Risk levels are established by determining two factors: first, calculating the site's sediment risk; and second, receiving water risk during periods of soil exposure (i.e. grading and site stabilization). Both factors are used to determine the site-specific Risk Level(s). LUPs can be determined to be Type 1 based on the flowchart in Attachment A.1.
48. Although this General Permit does not mandate specific setback distances, dischargers are encouraged to set back their construction activities from streams and wetlands whenever feasible to reduce the risk of impacting water quality (e.g., natural stream stability and habitat function). Because there is a reduced risk to receiving waters when setbacks are used, this General Permit gives credit to setbacks in the risk determination and post-construction storm water performance standards. The risk calculation and runoff reduction mechanisms in this General Permit are expected to facilitate compliance with any Regional Water Board and local agency setback requirements, and to encourage voluntary setbacks wherever practicable.
49. Rain events can occur at any time of the year in California. Therefore, a Rain Event Action Plan (REAP) is necessary for Risk Level 2 and 3 traditional construction projects (LUPs exempt) to ensure that active construction sites have adequate erosion and sediment controls implemented prior to the onset of a storm event, even if construction is planned only during the dry season.
50. Soil particles smaller than 0.02 millimeters (mm) (i.e., finer than medium silt) do not settle easily using conventional measures for sediment control (i.e., sediment basins). Given their long settling time, dislodging these soils results in a significant risk that fine particles will be released into surface waters and cause unacceptable downstream impacts. If operated correctly, an Active Treatment System (ATS<sup>5</sup>) can prevent or reduce the release of fine particles from construction sites.

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<sup>5</sup> An ATS is a treatment system that employs chemical coagulation, chemical flocculation, or electro coagulation in order to reduce turbidity caused by fine suspended sediment.

Use of an ATS can effectively reduce a site's risk of impacting receiving waters.

51. Dischargers located in a watershed area where a Total Maximum Daily Load (TMDL) has been adopted or approved by the Regional Water Board or U.S. EPA may be required by a separate Regional Water Board action to implement additional BMPs, conduct additional monitoring activities, and/or comply with an applicable waste load allocation and implementation schedule. Such dischargers may also be required to obtain an individual Regional Water Board permit specific to the area.

## **H. Effluent Standards**

52. The State Water Board convened a blue ribbon panel of storm water experts that submitted a report entitled, "The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities," dated June 19, 2006. The panel concluded that numeric limits or action levels are technically feasible to control construction storm water discharges, provided that certain conditions are considered. The panel also concluded that numeric effluent limitations (NELs) are feasible for discharges from construction sites that utilize an ATS. The State Water Board has incorporated the expert panel's suggestions into this General Permit, which includes numeric action levels (NALs) for pH and turbidity, and special numeric limits for ATS discharges.

### **Determining Compliance with Numeric Limitations**

53. This General Permit sets a pH NAL of 6.5 to 8.5, and a turbidity NAL of 250 NTU. The purpose of the NAL and its associated monitoring requirement is to provide operational information regarding the performance of the measures used at the site to minimize the discharge of pollutants and to protect beneficial uses and receiving waters from the adverse effects of construction-related storm water discharges. An exceedance of a NAL does not constitute a violation of this General Permit.
54. This General Permit requires dischargers with NAL exceedances to immediately implement additional BMPs and revise their Storm Water Pollution Prevention Plans (SWPPPs) accordingly to either prevent pollutants and authorized non-storm water discharges from contaminating storm water, or to substantially reduce the pollutants to levels consistently below the NALs. NAL exceedances are reported in the State Water Boards SMARTS system, and the discharger is

required to provide an NAL Exceedance Report when requested by a Regional Water Board.

**I. Receiving Water Limitations**

55. This General Permit requires all enrolled dischargers to determine the receiving waters potentially affected by their discharges and to comply with all applicable water quality standards, including any more stringent standards applicable to a water body.

**J. Sampling, Monitoring, Reporting and Record Keeping**

56. Visual monitoring of storm water and non-storm water discharges is required for all sites subject to this General Permit.

57. Records of all visual monitoring inspections are required to remain on-site during the construction period and for a minimum of three years.

58. For all Risk Level 3/LUP Type 3 and Risk Level 2/LUP Type 2 sites, this General Permit requires effluent monitoring for pH and turbidity. Sampling, analysis and monitoring requirements for effluent monitoring for pH and turbidity are contained in this General Permit.

59. Risk Level 3 and LUP Type 3 sites with effluent that exceeds the Receiving Water Monitoring Triggers contained in this General Permit and with direct discharges to receiving water are required to conduct receiving water monitoring. An exceedance of a Receiving Water Monitoring Trigger does not constitute a violation of this General Permit.

60. This General Permit establishes a 5 year, 24 hour (expressed in inches of rainfall) as an exemptions to the receiving water monitoring requirements for Risk Level 3 and LUP Type 3 dischargers.

61. If run-on is caused by a forest fire or any other natural disaster, then receiving water monitoring triggers do not apply.

62. For Risk Level 3 and LUP Type 3 sites larger than 30 acres and with direct discharges to receiving waters, this General Permit requires bioassessment sampling before and after site completion to determine if significant degradation to the receiving water's biota has occurred. Bioassessment sampling guidelines are contained in this General Permit.



63. A summary and evaluation of the sampling and analysis results will be submitted in the Annual Reports.
64. This General Permit contains sampling, analysis and monitoring requirements for non-visible pollutants at all sites subject to this General Permit.
65. Compliance with the General Permit relies upon dischargers to electronically self-report any discharge violations and to comply with any Regional Water Board enforcement actions.
66. This General Permit requires that all dischargers maintain a paper or electronic copy of all required records for three years from the date generated or date submitted, whichever is last. These records must be available at the construction site until construction is completed. For LUPs, these documents may be retained in a crew member's vehicle and made available upon request.

#### **K. Active Treatment System (ATS) Requirements**

67. Active treatment systems add chemicals to facilitate flocculation, coagulation and filtration of suspended sediment particles. The uncontrolled release of these chemicals to the environment can negatively affect the beneficial uses of receiving waters and/or degrade water quality (e.g., acute and chronic toxicity). Additionally, the batch storage and treatment of storm water through an ATS' can potentially cause physical impacts on receiving waters if storage volume is inadequate or due to sudden releases of the ATS batches and improperly designed outfalls.
68. If designed, operated and maintained properly an ATS can achieve very high removal rates of suspended sediment (measured as turbidity), albeit at sometimes significantly higher costs than traditional erosion/sediment control practices. As a result, this General Permit establishes NELs consistent with the expected level of typical ATS performance.
69. This General Permit requires discharges of storm water associated with construction activity that undergo active treatment to comply with special operational and effluent limitations to ensure that these discharges do not adversely affect the beneficial uses of the receiving waters or cause degradation of their water quality.
70. For ATS discharges, this General Permit establishes technology-based NELs for turbidity.

71. This General Permit establishes a 10 year, 24 hour (expressed in inches of rainfall) Compliance Storm Event exemption from the technology-based numeric effluent limitations for ATS discharges. Exceedances of the ATS turbidity NEL constitutes a violation of this General Permit.

#### **L. Post-Construction Requirements**

72. This General Permit includes performance standards for post-construction that are consistent with State Water Board [Resolution No. 2005-0006](#), "Resolution Adopting the Concept of Sustainability as a Core Value for State Water Board Programs and Directing Its Incorporation," and [2008-0030](#), "Requiring Sustainable Water Resources Management." The requirement for all construction sites to match pre-project hydrology will help ensure that the physical and biological integrity of aquatic ecosystems are sustained. This "runoff reduction" approach is analogous in principle to Low Impact Development (LID) and will serve to protect related watersheds and waterbodies from both hydrologic-based and pollution impacts associated with the post-construction landscape.

73. LUP projects are not subject to post-construction requirements due to the nature of their construction to return project sites to pre-construction conditions.

#### **M. Storm Water Pollution Prevention Plan Requirements**

74. This General Permit requires the development of a site-specific SWPPP. The SWPPP must include the information needed to demonstrate compliance with all requirements of this General Permit, and must be kept on the construction site and be available for review. The discharger shall ensure that a QSD develops the SWPPP.

75. To ensure proper site oversight, this General Permit requires a Qualified SWPPP Practitioner to oversee implementation of the BMPs required to comply with this General Permit.

#### **N. Regional Water Board Authorities**

76. Regional Water Boards are responsible for implementation and enforcement of this General Permit. A general approach to permitting is not always suitable for every construction site and environmental circumstances. Therefore, this General Permit recognizes that Regional Water Boards must have some flexibility and authority to alter, approve, exempt, or rescind permit authority granted under this

General Permit in order to protect the beneficial uses of our receiving waters and prevent degradation of water quality.

**IT IS HEREBY ORDERED** that all dischargers subject to this General Permit shall comply with the following conditions and requirements (including all conditions and requirements as set forth in Attachments A, B, C, D, E and F)<sup>6</sup>:

## **II. CONDITIONS FOR PERMIT COVERAGE**

### **A. Linear Underground/Overhead Projects (LUPs)**

1. Linear Underground/Overhead Projects (LUPs) include, but are not limited to, any conveyance, pipe, or pipeline for the transportation of any gaseous, liquid (including water and wastewater for domestic municipal services), liquescent, or slurry substance; any cable line or wire for the transmission of electrical energy; any cable line or wire for communications (e.g. telephone, telegraph, radio or television messages); and associated ancillary facilities. Construction activities associated with LUPs include, but are not limited to, (a) those activities necessary for the installation of underground and overhead linear facilities (e.g., conduits, substructures, pipelines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment, and associated ancillary facilities); and include, but are not limited to, (b) underground utility mark-out, potholing, concrete and asphalt cutting and removal, trenching, excavation, boring and drilling, access road and pole/tower pad and cable/wire pull station, substation construction, substructure installation, construction of tower footings and/or foundations, pole and tower installations, pipeline installations, welding, concrete and/ or pavement repair or replacement, and stockpile/borrow locations.
2. The Legally Responsible Person is responsible for obtaining coverage under the General Permit where the construction of pipelines, utility lines, fiber-optic cables, or other linear underground/overhead projects will occur across several properties unless the LUP construction activities are covered under another construction storm water permit.
3. Only LUPs shall comply with the conditions and requirements in Attachment A, A.1 & A.2 of this Order. The balance of this Order is not applicable to LUPs except as indicated in Attachment A.

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<sup>6</sup> These attachments are part of the General Permit itself and are not separate documents that are capable of being updated independently by the State Water Board.

**B. Obtaining Permit Coverage Traditional Construction Sites**

1. The Legally Responsible Person (LRP) (see Special Provisions, Electronic Signature and Certification Requirements, Section IV.I.1) must obtain coverage under this General Permit.
2. To obtain coverage, the LRP must electronically file Permit Registration Documents (PRDs) prior to the commencement of construction activity. Failure to obtain coverage under this General Permit for storm water discharges to waters of the United States is a violation of the CWA and the California Water Code.
3. PRDs shall consist of:
  - a. Notice of Intent (NOI)
  - b. Risk Assessment (Section VIII)
  - c. Site Map
  - d. Storm Water Pollution Prevention Plan (Section XIV)
  - e. Annual Fee
  - f. Signed Certification Statement

Any information provided to the Regional Water Board shall comply with the Homeland Security Act and any other federal law that concerns security in the United States; any information that does not comply should not be submitted.

Attachment B contains additional PRD information. Dischargers must electronically file the PRDs, and mail the appropriate annual fee to the State Water Board.

4. This permit is effective on July 1, 2010.
  - a. **Dischargers Obtaining Coverage On or After July 1, 2010:** All dischargers requiring coverage on or after July 1, 2010, shall electronically file their PRDs prior to the commencement of construction activities, and mail the appropriate annual fee no later than seven days prior to the commencement of construction activities. Permit coverage shall not commence until the PRDs and the annual fee are received by the State Water Board, and a WDID number is assigned and sent by SMARTS.
  - b. **Dischargers Covered Under 99-08-DWQ and 2003-0007-DWQ:** Existing dischargers subject to State Water Board Order No. 99-08-DWQ (existing dischargers) will continue coverage under 99-08-DWQ until July 1, 2010. After July 1, 2010, all NOIs subject to State Water Board Order No. 99-08-DWQ will be terminated.

Existing dischargers shall electronically file their PRDs no later than July 1, 2010. If an existing discharger's site acreage subject to the annual fee has changed, it shall mail a revised annual fee no less than seven days after receiving the revised annual fee notification, **or else lose permit coverage**. All existing dischargers shall be exempt from the risk determination requirements in Section VIII of this General Permit until two years after permit adoption. All existing dischargers are therefore subject to Risk Level 1 requirements regardless of their site's sediment and receiving water risks. However, a Regional Board retains the authority to require an existing discharger to comply with the Section VIII risk determination requirements.

5. The discharger is only considered covered by this General Permit upon receipt of a Waste Discharger Identification (WDID) number assigned and sent by the State Water Board Storm water Multi-Application and Report Tracking System (SMARTS). In order to demonstrate compliance with this General Permit, the discharger must obtain a WDID number and must present documentation of a valid WDID upon demand.
6. During the period this permit is subject to review by the U.S. EPA, the prior permit (State Water Board Order No. 99-08-DWQ) remains in effect. Existing dischargers under the prior permit will continue to have coverage under State Water Board Order No. 99-08-DWQ until this General Permit takes effect on July 1, 2010. Dischargers who complete their projects and electronically file an NOT prior to July 1, 2010, are not required to obtain coverage under this General Permit.
7. Small Construction Rainfall Erosivity Waiver

EPA's Small Construction Erosivity Waiver applies to sites between one and five acres demonstrating that there are no adverse water quality impacts.

Dischargers eligible for a Rainfall Erosivity Waiver based on low erosivity potential shall complete the electronic Notice of Intent (NOI) and Sediment Risk form through the State Water Board's SMARTS system, certifying that the construction activity will take place during a period when the value of the rainfall erosivity factor is less than five. Where the LRP changes or another LRP is added during construction, the new LRP must also submit a waiver certification through the SMARTS system.

If a small construction site continues beyond the projected completion date given on the waiver certification, the LRP shall recalculate the

rainfall erosivity factor for the new project duration and submit this information through the SMARTS system. If the new R factor is below five (5), the discharger shall update through SMARTS all applicable information on the waiver certification and retain a copy of the revised waiver onsite. The LRP shall submit the new waiver certification 30 days prior to the projected completion date listed on the original waiver form to assure exemption from permitting requirements is uninterrupted. If the new R factor is five (5) or above, the LRP shall be required to apply for coverage under this Order.

8. In the case of a public emergency that requires immediate construction activities, a discharger shall submit a brief description of the emergency construction activity within five days of the onset of construction, and then shall submit all PRDs within thirty days.

### **C. Revising Permit Coverage for Change of Acreage or New Ownership**

1. The discharger may reduce or increase the total acreage covered under this General Permit when a portion of the site is complete and/or conditions for termination of coverage have been met (See Section II.D Conditions for Termination of Coverage); when ownership of a portion of the site is sold to a different entity; or when new acreage, subject to this General Permit, is added to the site.
2. Within 30 days of a reduction or increase in total disturbed acreage, the discharger shall electronically file revisions to the PRDs that include:
  - a. A revised NOI indicating the new project size;
  - b. A revised site map showing the acreage of the site completed, acreage currently under construction, acreage sold/transferred or added, and acreage currently stabilized in accordance with the Conditions for Termination of Coverage in Section II.D below.
  - c. SWPPP revisions, as appropriate; and
  - d. Certification that any new landowners have been notified of applicable requirements to obtain General Permit coverage. The certification shall include the name, address, telephone number, and e-mail address of the new landowner.
  - e. If the project acreage has increased, dischargers shall mail payment of revised annual fees within 14 days of receiving the revised annual fee notification.

3. The discharger shall continue coverage under the General Permit for any parcel that has not achieved “Final Stabilization” as defined in Section II.D.
4. When an LRP with active General Permit coverage transfers its LRP status to another person or entity that qualifies as an LRP, the existing LRP shall inform the new LRP of the General Permit’s requirements. In order for the new LRP to continue the construction activity on its parcel of property, the new LRP, or the new LRP’s approved signatory, must submit PRDs in accordance with this General Permit’s requirements.

#### **D. Conditions for Termination of Coverage**

1. Within 90 days of when construction is complete or ownership has been transferred, the discharger shall electronically file a Notice of Termination (NOT), a final site map, and photos through the State Water Boards SMARTS system. Filing a NOT certifies that all General Permit requirements have been met. The Regional Water Board will consider a construction site complete only when all portions of the site have been transferred to a new owner, or all of the following conditions have been met:
  - a. For purposes of “final stabilization,” the site will not pose any additional sediment discharge risk than it did prior to the commencement of construction activity;
  - b. There is no potential for construction-related storm water pollutants to be discharged into site runoff;
  - c. Final stabilization has been reached;
  - d. Construction materials and wastes have been disposed of properly;
  - e. Compliance with the Post-Construction Standards in Section XIII of this General Permit has been demonstrated;
  - f. Post-construction storm water management measures have been installed and a long-term maintenance plan<sup>7</sup> has been established; and
  - g. All construction-related equipment, materials and any temporary BMPs no longer needed are removed from the site.

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<sup>7</sup> For the purposes of this requirement a long-term maintenance plan will be designed for a minimum of five years, and will describe the procedures to ensure that the post-construction storm water management measures are adequately maintained.



2. The discharger shall certify that final stabilization conditions are satisfied in their NOT. Failure to certify shall result in continuation of permit coverage and annual billing.
3. The NOT must demonstrate through photos, RUSLE or RUSLE2, or results of testing and analysis that the site meets all of the conditions above (Section II.D.1) and the final stabilization condition (Section II.D.1.a) is attained by one of the following methods:
  - a. "70% final cover method," no computational proof required

**OR:**

- b. "RUSLE or RUSLE2 method," computational proof required

**OR:**

- c. "Custom method", the discharger shall demonstrate in some other manner than a or b, above, that the site complies with the "final stabilization" requirement in Section II.D.1.a.

### III. DISCHARGE PROHIBITIONS

- A.** Dischargers shall not violate any discharge prohibitions contained in applicable Basin Plans or statewide water quality control plans. Waste discharges to Areas of Special Biological Significance (ASBS) are prohibited by the California Ocean Plan, unless granted an exception issued by the State Water Board.
- B.** All discharges are prohibited except for the storm water and non-storm water discharges specifically authorized by this General Permit or another NPDES permit.
- C.** Authorized non-storm water discharges may include those from de-chlorinated potable water sources such as: fire hydrant flushing, irrigation of vegetative erosion control measures, pipe flushing and testing, water to control dust, uncontaminated ground water from dewatering, and other discharges not subject to a separate general NPDES permit adopted by a Regional Water Board. The discharge of non-storm water is authorized under the following conditions:
1. The discharge does not cause or contribute to a violation of any water quality standard;
  2. The discharge does not violate any other provision of this General Permit;
  3. The discharge is not prohibited by the applicable Basin Plan;
  4. The discharger has included and implemented specific BMPs required by this General Permit to prevent or reduce the contact of the non-storm water discharge with construction materials or equipment.
  5. The discharge does not contain toxic constituents in toxic amounts or (other) significant quantities of pollutants;
  6. The discharge is monitored and meets the applicable NALs; and
  7. The discharger reports the sampling information in the Annual Report.

If any of the above conditions are not satisfied, the discharge is not authorized by this General Permit. The discharger shall notify the Regional Water Board of any anticipated non-storm water discharges not already authorized by this General Permit or another NPDES permit, to determine whether a separate NPDES permit is necessary.

- D.** Debris resulting from construction activities are prohibited from being discharged from construction sites.
- E.** When soil contamination is found or suspected and a responsible party is not identified, or the responsible party fails to promptly take the appropriate action, the discharger shall have those soils sampled and tested to ensure proper handling and public safety measures are implemented. The discharger shall notify the appropriate local, State, and federal agency(ies) when contaminated soil is found at a construction site, and will notify the appropriate Regional Water Board.

## **IV. SPECIAL PROVISIONS**

### **A. Duty to Comply**

1. The discharger shall comply with all of the conditions of this General Permit. Any permit noncompliance constitutes a violation of the Clean Water Act (CWA) and the Porter-Cologne Water Quality Control Act and is grounds for enforcement action and/or removal from General Permit coverage.
2. The discharger shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if this General Permit has not yet been modified to incorporate the requirement.

### **B. General Permit Actions**

1. This General Permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the discharger for a General Permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not annul any General Permit condition.
2. If any toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the CWA for a toxic pollutant which is present in the discharge and that standard or prohibition is more stringent than any limitation on the pollutant in this General Permit, this General Permit shall be modified or revoked and reissued to conform to the toxic effluent standard or prohibition and the dischargers so notified.

### **C. Need to Halt or Reduce Activity Not a Defense**

It shall not be a defense for a discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this General Permit.

### **D. Duty to Mitigate**

The discharger shall take all responsible steps to minimize or prevent any discharge in violation of this General Permit, which has a reasonable likelihood of adversely affecting human health or the environment.

**E. Proper Operation and Maintenance**

The discharger shall at all times properly operate and maintain any facilities and systems of treatment and control (and related appurtenances) which are installed or used by the discharger to achieve compliance with the conditions of this General Permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance may require the operation of backup or auxiliary facilities or similar systems installed by a discharger when necessary to achieve compliance with the conditions of this General Permit.

**F. Property Rights**

This General Permit does not convey any property rights of any sort or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor does it authorize any infringement of Federal, State, or local laws or regulations.

**G. Duty to Maintain Records and Provide Information**

1. The discharger shall maintain a paper or electronic copy of all required records, including a copy of this General Permit, for three years from the date generated or date submitted, whichever is last. These records shall be available at the construction site until construction is completed.
2. The discharger shall furnish the Regional Water Board, State Water Board, or U.S. EPA, within a reasonable time, any requested information to determine compliance with this General Permit. The discharger shall also furnish, upon request, copies of records that are required to be kept by this General Permit.

**H. Inspection and Entry**

The discharger shall allow the Regional Water Board, State Water Board, U.S. EPA, and/or, in the case of construction sites which discharge through a municipal separate storm sewer, an authorized representative of the municipal operator of the separate storm sewer system receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the discharger's premises at reasonable times where a regulated construction activity is being conducted or where records must be kept under the conditions of this General Permit;

2. Access and copy at reasonable times any records that must be kept under the conditions of this General Permit;
3. Inspect at reasonable times the complete construction site, including any off-site staging areas or material storage areas, and the erosion/sediment controls; and
4. Sample or monitor at reasonable times for the purpose of ensuring General Permit compliance.

#### **I. Electronic Signature and Certification Requirements**

1. All Permit Registration Documents (PRDs) and Notices of Termination (NOTs) shall be electronically signed, certified, and submitted via SMARTS to the State Water Board. Either the Legally Responsible Person (LRP), as defined in Appendix 5 – Glossary, or a person legally authorized to sign and certify PRDs and NOTs on behalf of the LRP (the LRP's Approved Signatory, as defined in Appendix 5 - Glossary) must submit all information electronically via SMARTS.
2. Changes to Authorization. If an Approved Signatory's authorization is no longer accurate, a new authorization satisfying the requirements of paragraph (a) of this section must be submitted via SMARTS prior to or together with any reports, information or applications to be signed by an Approved Signatory.
3. All Annual Reports, or other information required by the General Permit (other than PRDs and NOTs) or requested by the Regional Water Board, State Water Board, U.S. EPA, or local storm water management agency shall be certified and submitted by the LRP or the LRP's Approved Signatory.

#### **J. Certification**

Any person signing documents under Section IV.I above, shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

## **K. Anticipated Noncompliance**

The discharger shall give advance notice to the Regional Water Board and local storm water management agency of any planned changes in the construction activity, which may result in noncompliance with General Permit requirements.

## **L. Bypass**

Bypass<sup>8</sup> is prohibited. The Regional Water Board may take enforcement action against the discharger for bypass unless:

1. Bypass was unavoidable to prevent loss of life, personal injury or severe property damage;<sup>9</sup>
2. There were no feasible alternatives to bypass, such as the use of auxiliary treatment facilities, retention of untreated waste, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that could occur during normal periods of equipment downtime or preventative maintenance;
3. The discharger submitted a notice at least ten days in advance of the need for a bypass to the Regional Water Board; or
4. The discharger may allow a bypass to occur that does not cause effluent limitations to be exceeded, but only if it is for essential maintenance to assure efficient operation. In such a case, the above bypass conditions are not applicable. The discharger shall submit notice of an unanticipated bypass as required.

## **M. Upset**

1. A discharger that wishes to establish the affirmative defense of an upset<sup>10</sup> in an action brought for noncompliance shall demonstrate,

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<sup>8</sup> The intentional diversion of waste streams from any portion of a treatment facility

<sup>9</sup> Severe property damage means substantial physical damage to property, damage to the treatment facilities that causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

<sup>10</sup> An exceptional incident in which there is unintentional and temporary noncompliance the technology based numeric effluent limitations because of factors beyond the reasonable control of the discharger. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

through properly signed, contemporaneous operating logs, or other relevant evidence that:

- a. An upset occurred and that the discharger can identify the cause(s) of the upset
  - b. The treatment facility was being properly operated by the time of the upset
  - c. The discharger submitted notice of the upset as required; and
  - d. The discharger complied with any remedial measures required
2. No determination made before an action of noncompliance occurs, such as during administrative review of claims that noncompliance was caused by an upset, is final administrative action subject to judicial review.
  3. In any enforcement proceeding, the discharger seeking to establish the occurrence of an upset has the burden of proof

#### **N. Penalties for Falsification of Reports**

Section 309(c)(4) of the CWA provides that any person who knowingly makes any false material statement, representation, or certification in any record or other document submitted or required to be maintained under this General Permit, including reports of compliance or noncompliance shall upon conviction, be punished by a fine of not more than \$10,000 or by imprisonment for not more than two years or by both.

#### **O. Oil and Hazardous Substance Liability**

Nothing in this General Permit shall be construed to preclude the institution of any legal action or relieve the discharger from any responsibilities, liabilities, or penalties to which the discharger is or may be subject to under Section 311 of the CWA.

#### **P. Severability**

The provisions of this General Permit are severable; and, if any provision of this General Permit or the application of any provision of this General Permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this General Permit shall not be affected thereby.

#### **Q. Reopener Clause**



This General Permit may be modified, revoked and reissued, or terminated for cause due to promulgation of amended regulations, receipt of U.S. EPA guidance concerning regulated activities, judicial decision, or in accordance with 40 Code of Federal Regulations (CFR) 122.62, 122.63, 122.64, and 124.5.

#### **R. Penalties for Violations of Permit Conditions**

1. Section 309 of the CWA provides significant penalties for any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the CWA or any permit condition or limitation implementing any such section in a permit issued under Section 402. Any person who violates any permit condition of this General Permit is subject to a civil penalty not to exceed \$37,500<sup>11</sup> per calendar day of such violation, as well as any other appropriate sanction provided by Section 309 of the CWA.
2. The Porter-Cologne Water Quality Control Act also provides for civil and criminal penalties, which in some cases are greater than those under the CWA.

#### **S. Transfers**

This General Permit is not transferable.

#### **T. Continuation of Expired Permit**

This General Permit continues in force and effect until a new General Permit is issued or the SWRCB rescinds this General Permit. Only those dischargers authorized to discharge under the expiring General Permit are covered by the continued General Permit.

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<sup>11</sup> May be further adjusted in accordance with the Federal Civil Penalties Inflation Adjustment Act.

## V. EFFLUENT STANDARDS & RECEIVING WATER MONITORING

### A. Narrative Effluent Limitations

1. Storm water discharges and authorized non-storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.
2. Dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.

**Table 1- Numeric Action Levels, Test Methods, Detection Limits, and Reporting Units**

Parameter	Test Method	Discharge Type	Min. Detection Limit	Units	Numeric Action Level
pH	Field test with calibrated portable instrument	Risk Level 2	0.2	pH units	lower NAL = 6.5 upper NAL = 8.5
		Risk Level 3			lower NAL = 6.5 upper NAL = 8.5
Turbidity	EPA 0180.1 and/or field test with calibrated portable instrument	Risk Level 2	1	NTU	250 NTU
		Risk Level 3			250 NTU

### B. Numeric Action Levels (NALs)

1. For Risk Level 2 and 3 dischargers, the lower storm event average NAL for pH is 6.5 pH units and the upper storm event average NAL for

pH is 8.5 pH units. The discharger shall take actions as described below if the discharge is outside of this range of pH values.

2. For Risk Level 2 and 3 dischargers, the NAL storm event daily average for turbidity is 250 NTU. The discharger shall take actions as described below if the discharge is outside of this range of turbidity values.
3. Whenever the results from a storm event daily average indicate that the discharge is below the lower NAL for pH, exceeds the upper NAL for pH, or exceeds the turbidity NAL (as listed in Table 1), the discharger shall conduct a construction site and run-on evaluation to determine whether pollutant source(s) associated with the site's construction activity may have caused or contributed to the NAL exceedance and shall immediately implement corrective actions if they are needed.
4. The site evaluation shall be documented in the SWPPP and specifically address whether the source(s) of the pollutants causing the exceedance of the NAL:
  - a. Are related to the construction activities and whether additional BMPs are required to (1) meet BAT/BCT requirements; (2) reduce or prevent pollutants in storm water discharges from causing exceedances of receiving water objectives; and (3) determine what corrective action(s) were taken or will be taken and with a description of the schedule for completion.

**AND/OR:**

- b. Are related to the run-on associated with the construction site location and whether additional BMPs measures are required to (1) meet BAT/BCT requirements; (2) reduce or prevent pollutants in storm water discharges from causing exceedances of receiving water objectives; and (3) what corrective action(s) were taken or will be taken with a description of the schedule for completion.

**C. Receiving Water Monitoring Triggers**

1. The receiving water monitoring triggers for Risk Level 3 dischargers with direct discharges to surface waters are triggered when the daily average effluent pH values during any site phase when there is a high risk of pH discharge<sup>12</sup> fall outside of the range of 6.0 and 9.0 pH units, or when the daily average effluent turbidity exceeds 500 NTU.

2. Risk Level 3 dischargers with with direct discharges to surface waters shall conduct receiving water monitoring whenever their effluent monitoring results exceed the receiving water monitoring triggers. If the pH trigger is exceeded, the receiving water shall be monitored for pH for the duration of coverage under this General Permit. If the turbidity trigger is exceeded, the receiving water shall be monitored for turbidity and SSC for the duration of coverage under this general permit.
3. Risk Level 3 dischargers with direct discharges to surfaces waters shall initiate receiving water monitoring when the triggers are exceeded unless the storm event causing the exceedance is determined after the fact to equal to or greater than the 5-year 24-hour storm (expressed in inches of rainfall) as determined by using these maps:

<http://www.wrcc.dri.edu/pcpnfreq/nca5y24.gif>  
<http://www.wrcc.dri.edu/pcpnfreq/sca5y24.gif>

Verification of the 5-year 24-hour storm event shall be done by reporting on-site rain gauge readings as well as nearby governmental rain gauge readings.

4. If run-on is caused by a forest fire or any other natural disaster, then receiving water monitoring triggers do not apply.

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<sup>12</sup> A period of high risk of pH discharge is defined as a project's complete utilities phase, complete vertical build phase, and any portion of any phase where significant amounts of materials are placed directly on the land at the site in a manner that could result in significant alterations of the background pH of the discharges.

## **VI. RECEIVING WATER LIMITATIONS**

- A.** The discharger shall ensure that storm water discharges and authorized non-storm water discharges to any surface or ground water will not adversely affect human health or the environment.
- B.** The discharger shall ensure that storm water discharges and authorized non-storm water discharges will not contain pollutants in quantities that threaten to cause pollution or a public nuisance.
- C.** The discharger shall ensure that storm water discharges and authorized non-storm water discharges will not contain pollutants that cause or contribute to an exceedance of any applicable water quality objectives or water quality standards (collectively, WQS) contained in a Statewide Water Quality Control Plan, the California Toxics Rule, the National Toxics Rule, or the applicable Regional Water Board's Water Quality Control Plan (Basin Plan).
- D.** Dischargers located within the watershed of a CWA § 303(d) impaired water body, for which a TMDL has been approved by the U.S. EPA, shall comply with the approved TMDL if it identifies "construction activity" or land disturbance as a source of the pollution.

## VII. TRAINING QUALIFICATIONS AND CERTIFICATION REQUIREMENTS

### A. General

The discharger shall ensure that all persons responsible for implementing requirements of this General Permit shall be appropriately trained in accordance with this Section. Training should be both formal and informal, occur on an ongoing basis, and should include training offered by recognized governmental agencies or professional organizations. Those responsible for preparing and amending SWPPPs shall comply with the requirements in this Section VII.

The discharger shall provide documentation of all training for persons responsible for implementing the requirements of this General Permit in the Annual Reports.

### B. SWPPP Certification Requirements

1. **Qualified SWPPP Developer:** The discharger shall ensure that SWPPPs are written, amended and certified by a Qualified SWPPP Developer (QSD). A QSD shall have one of the following registrations or certifications, and appropriate experience, as required for:
  - a. A California registered professional civil engineer;
  - b. A California registered professional geologist or engineering geologist;
  - c. A California registered landscape architect;
  - d. A professional hydrologist registered through the American Institute of Hydrology;
  - e. A Certified Professional in Erosion and Sediment Control (CPESC)<sup>TM</sup> registered through Enviro Cert International, Inc.;
  - f. A Certified Professional in Storm Water Quality (CPSWQ)<sup>TM</sup> registered through Enviro Cert International, Inc.; or
  - g. A professional in erosion and sediment control registered through the National Institute for Certification in Engineering Technologies (NICET).

Effective two years after the adoption date of this General Permit, a QSD shall have attended a State Water Board-sponsored or approved QSD training course.

2. The discharger shall list the name and telephone number of the currently designated Qualified SWPPP Developer(s) in the SWPPP.
3. **Qualified SWPPP Practitioner:** The discharger shall ensure that all BMPs required by this General Permit are implemented by a Qualified SWPPP Practitioner (QSP). A QSP is a person responsible for non-storm water and storm water visual observations, sampling and analysis. Effective two years from the date of adoption of this General Permit, a QSP shall be either a QSD or have one of the following certifications:
  - a. A certified erosion, sediment and storm water inspector registered through Enviro Cert International, Inc.; or
  - b. A certified inspector of sediment and erosion control registered through Certified Inspector of Sediment and Erosion Control, Inc.

Effective two years after the adoption date of this General Permit, a QSP shall have attended a State Water Board-sponsored or approved QSP training course.

4. The LRP shall list in the SWPPP, the name of any Approved Signatory, and provide a copy of the written agreement or other mechanism that provides this authority from the LRP in the SWPPP.
5. The discharger shall include, in the SWPPP, a list of names of all contractors, subcontractors, and individuals who will be directed by the Qualified SWPPP Practitioner. This list shall include telephone numbers and work addresses. Specific areas of responsibility of each subcontractor and emergency contact numbers shall also be included.
6. The discharger shall ensure that the SWPPP and each amendment will be signed by the Qualified SWPPP Developer. The discharger shall include a listing of the date of initial preparation and the date of each amendment in the SWPPP.

## VIII. RISK DETERMINATION

The discharger shall calculate the site's sediment risk and receiving water risk during periods of soil exposure (i.e. grading and site stabilization) and use the calculated risks to determine a Risk Level(s) using the methodology in

Appendix 1. For any site that spans two or more planning watersheds,<sup>13</sup> the discharger shall calculate a separate Risk Level for each planning watershed. The discharger shall notify the State Water Board of the site's Risk Level determination(s) and shall include this determination as a part of submitting the PRDs. If a discharger ends up with more than one Risk Level determination, the Regional Water Board may choose to break the project into separate levels of implementation.

## **IX. RISK LEVEL 1 REQUIREMENTS**

Risk Level 1 Dischargers shall comply with the requirements included in Attachment C of this General Permit.

## **X. RISK LEVEL 2 REQUIREMENTS**

Risk Level 2 Dischargers shall comply with the requirements included in Attachment D of this General Permit.

## **XI. RISK LEVEL 3 REQUIREMENTS**

Risk Level 3 Dischargers shall comply with the requirements included in Attachment E of this General Permit.

## **XII. ACTIVE TREATMENT SYSTEMS (ATS)**

Dischargers choosing to implement an ATS on their site shall comply with all of the requirements in Attachment F of this General Permit.

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<sup>13</sup> Planning watershed: defined by the Calwater Watershed documents as a watershed that ranges in size from approximately 3,000 to 10,000 acres <http://cain.ice.ucdavis.edu/calwater/calwfaq.html>, <http://gis.ca.gov/catalog/BrowseRecord.epl?id=22175> .



### **XIII. POST-CONSTRUCTION STANDARDS**

- A.** All dischargers shall comply with the following runoff reduction requirements unless they are located within an area subject to post-construction standards of an active Phase I or II municipal separate storm sewer system (MS4) permit that has an approved Storm Water Management Plan.
1. This provision shall take effect three years from the adoption date of this permit, or later at the discretion of the Executive Officer of the Regional Board.
  2. The discharger shall demonstrate compliance with the requirements of this section by submitting with their NOI a map and worksheets in accordance with the instructions in Appendix 2. The discharger shall use non-structural controls unless the discharger demonstrates that non-structural controls are infeasible or that structural controls will produce greater reduction in water quality impacts.
  3. The discharger shall, through the use of non-structural and structural measures as described in Appendix 2, replicate the pre-project water balance (for this permit, defined as the volume of rainfall that ends up as runoff) for the smallest storms up to the 85<sup>th</sup> percentile storm event (or the smallest storm event that generates runoff, whichever is larger). Dischargers shall inform Regional Water Board staff at least 30 days prior to the use of any structural control measure used to comply with this requirement. Volume that cannot be addressed using non-structural practices shall be captured in structural practices and approved by the Regional Water Board. When seeking Regional Board approval for the use of structural practices, dischargers shall document the infeasibility of using non-structural practices on the project site, or document that there will be fewer water quality impacts through the use of structural practices.
  4. For sites whose disturbed area exceeds two acres, the discharger shall preserve the pre-construction drainage density (miles of stream length per square mile of drainage area) for all drainage areas within the area serving a first order stream<sup>14</sup> or larger stream and ensure that post-project time of runoff concentration is equal or greater than pre-project time of concentration.

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<sup>14</sup> A first order stream is defined as a stream with no tributaries.

- B.** All dischargers shall implement BMPs to reduce pollutants in storm water discharges that are reasonably foreseeable after all construction phases have been completed at the site (Post-construction BMPs).

#### **XIV. SWPPP REQUIREMENTS**

- A.** The discharger shall ensure that the Storm Water Pollution Prevention Plans (SWPPPs) for all traditional project sites are developed and amended or revised by a QSD. The SWPPP shall be designed to address the following objectives:
1. All pollutants and their sources, including sources of sediment associated with construction, construction site erosion and all other activities associated with construction activity are controlled;
  2. Where not otherwise required to be under a Regional Water Board permit, all non-storm water discharges are identified and either eliminated, controlled, or treated;
  3. Site BMPs are effective and result in the reduction or elimination of pollutants in storm water discharges and authorized non-storm water discharges from construction activity to the BAT/BCT standard;
  4. Calculations and design details as well as BMP controls for site run-on are complete and correct, and
  5. Stabilization BMPs installed to reduce or eliminate pollutants after construction are completed.
- B.** To demonstrate compliance with requirements of this General Permit, the QSD shall include information in the SWPPP that supports the conclusions, selections, use, and maintenance of BMPs.
- C.** The discharger shall make the SWPPP available at the construction site during working hours while construction is occurring and shall be made available upon request by a State or Municipal inspector. When the original SWPPP is retained by a crewmember in a construction vehicle and is not currently at the construction site, current copies of the BMPs and map/drawing will be left with the field crew and the original SWPPP shall be made available via a request by radio/telephone.

## **XV. REGIONAL WATER BOARD AUTHORITIES**

- A.** In the case where the Regional Water Board does not agree with the discharger's self-reported risk level (e.g., they determine themselves to be a Level 1 Risk when they are actually a Level 2 Risk site), Regional Water Boards may either direct the discharger to reevaluate the Risk Level(s) for their site or terminate coverage under this General Permit.
- B.** Regional Water Boards may terminate coverage under this General Permit for dischargers who fail to comply with its requirements or where they determine that an individual NPDES permit is appropriate.
- C.** Regional Water Boards may require dischargers to submit a Report of Waste Discharge / NPDES permit application for Regional Water Board consideration of individual requirements.
- D.** Regional Water Boards may require additional Monitoring and Reporting Program Requirements, including sampling and analysis of discharges to sediment-impaired water bodies.
- E.** Regional Water Boards may require dischargers to retain records for more than the three years required by this General Permit.

## **XVI. ANNUAL REPORTING REQUIREMENTS**

- A.** All dischargers shall prepare and electronically submit an Annual Report no later than September 1 of each year.
- B.** The discharger shall certify each Annual Report in accordance with the Special Provisions.
- C.** The discharger shall retain an electronic or paper copy of each Annual Report for a minimum of three years after the date the annual report is filed.
- D.** The discharger shall include storm water monitoring information in the Annual Report consisting of:
  - 1. a summary and evaluation of all sampling and analysis results, including copies of laboratory reports;
  - 2. the analytical method(s), method reporting unit(s), and method detection limit(s) of each analytical parameter (analytical results that are less than the method detection limit shall be reported as "less than the method detection limit");
  - 3. a summary of all corrective actions taken during the compliance year;
  - 4. identification of any compliance activities or corrective actions that were not implemented;
  - 5. a summary of all violations of the General Permit;
  - 6. the names of individual(s) who performed the facility inspections, sampling, visual observation (inspections), and/or measurements;
  - 7. the date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation (rain gauge); and
  - 8. the visual observation and sample collection exception records and reports specified in Attachments C, D, and E.
- E.** The discharger shall provide training information in the Annual Report consisting of:
  - 1. documentation of all training for individuals responsible for all activities associated with compliance with this General Permit;

2. documentation of all training for individuals responsible for BMP installation, inspection, maintenance, and repair; and
3. documentation of all training for individuals responsible for overseeing, revising, and amending the SWPPP.

## ATTACHMENT C RISK LEVEL 1 REQUIREMENTS

### A. Effluent Standards

*[These requirements are the same as those in the General Permit order.]*

1. Narrative – Risk Level 1 dischargers shall comply with the narrative effluent standards listed below:
  - a. Storm water discharges and authorized non-storm water discharges regulated by this General Permit shall not contain a hazardous substance equal to or in excess of reportable quantities established in 40 C.F.R. §§ 117.3 and 302.4, unless a separate NPDES Permit has been issued to regulate those discharges.
  - b. Dischargers shall minimize or prevent pollutants in storm water discharges and authorized non-storm water discharges through the use of controls, structures, and management practices that achieve BAT for toxic and non-conventional pollutants and BCT for conventional pollutants.
2. Numeric – Risk Level 1 dischargers are not subject to a numeric effluent standard.

### B. Good Site Management "Housekeeping"

1. Risk Level 1 dischargers shall implement good site management (i.e., "housekeeping") measures for construction materials that could potentially be a threat to water quality if discharged. At a minimum, Risk Level 1 dischargers shall implement the following good housekeeping measures:
  - a. Conduct an inventory of the products used and/or expected to be used and the end products that are produced and/or expected to be produced. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).
  - b. Cover and berm loose stockpiled construction materials that are not actively being used (i.e. soil, spoils, aggregate, fly-ash, stucco, hydrated lime, etc.).

- c. Store chemicals in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed).
  - d. Minimize exposure of construction materials to precipitation. This does not include materials and equipment that are designed to be outdoors and exposed to environmental conditions (i.e. poles, equipment pads, cabinets, conductors, insulators, bricks, etc.).
  - e. Implement BMPs to prevent the off-site tracking of loose construction and landscape materials.
2. Risk Level 1 dischargers shall implement good housekeeping measures for waste management, which, at a minimum, shall consist of the following:
- a. Prevent disposal of any rinse or wash waters or materials on impervious or pervious site surfaces or into the storm drain system.
  - b. Ensure the containment of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the storm water drainage system or receiving water.
  - c. Clean or replace sanitation facilities and inspecting them regularly for leaks and spills.
  - d. Cover waste disposal containers at the end of every business day and during a rain event.
  - e. Prevent discharges from waste disposal containers to the storm water drainage system or receiving water.
  - f. Contain and securely protect stockpiled waste material from wind and rain at all times unless actively being used.
  - g. Implement procedures that effectively address hazardous and non-hazardous spills.
  - h. Develop a spill response and implementation element of the SWPPP prior to commencement of construction activities. The SWPPP shall require that:
    - i. Equipment and materials for cleanup of spills shall be available on site and that spills and leaks shall be cleaned up immediately and disposed of properly; and



- ii. Appropriate spill response personnel are assigned and trained.
  - i. Ensure the containment of concrete washout areas and other washout areas that may contain additional pollutants so there is no discharge into the underlying soil and onto the surrounding areas.
3. Risk Level 1 dischargers shall implement good housekeeping for vehicle storage and maintenance, which, at a minimum, shall consist of the following:
  - a. Prevent oil, grease, or fuel to leak in to the ground, storm drains or surface waters.
  - b. Place all equipment or vehicles, which are to be fueled, maintained and stored in a designated area fitted with appropriate BMPs.
  - c. Clean leaks immediately and disposing of leaked materials properly.
4. Risk Level 1 dischargers shall implement good housekeeping for landscape materials, which, at a minimum, shall consist of the following:
  - a. Contain stockpiled materials such as mulches and topsoil when they are not actively being used.
  - b. Contain fertilizers and other landscape materials when they are not actively being used.
  - c. Discontinue the application of any erodible landscape material within 2 days before a forecasted rain event or during periods of precipitation.
  - d. Apply erodible landscape material at quantities and application rates according to manufacture recommendations or based on written specifications by knowledgeable and experienced field personnel.
  - e. Stack erodible landscape material on pallets and covering or storing such materials when not being used or applied.
5. Risk Level 1 dischargers shall conduct an assessment and create a list of potential pollutant sources and identify any areas of the site where additional BMPs are necessary to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges. This potential pollutant list shall be kept with the SWPPP and shall identify

all non-visible pollutants which are known, or should be known, to occur on the construction site. At a minimum, when developing BMPs, Risk Level 1 dischargers shall do the following:

- a. Consider the quantity, physical characteristics (e.g., liquid, powder, solid), and locations of each potential pollutant source handled, produced, stored, recycled, or disposed of at the site.
  - b. Consider the degree to which pollutants associated with those materials may be exposed to and mobilized by contact with storm water.
  - c. Consider the direct and indirect pathways that pollutants may be exposed to storm water or authorized non-storm water discharges. This shall include an assessment of past spills or leaks, non-storm water discharges, and discharges from adjoining areas.
  - d. Ensure retention of sampling, visual observation, and inspection records.
  - e. Ensure effectiveness of existing BMPs to reduce or prevent pollutants in storm water discharges and authorized non-storm water discharges.
6. Risk Level 1 dischargers shall implement good housekeeping measures on the construction site to control the air deposition of site materials and from site operations. Such particulates can include, but are not limited to, sediment, nutrients, trash, metals, bacteria, oil and grease and organics.

### **C. Non-Storm Water Management**

1. Risk Level 1 dischargers shall implement measures to control all non-storm water discharges during construction.
2. Risk Level 1 dischargers shall wash vehicles in such a manner as to prevent non-storm water discharges to surface waters or MS4 drainage systems.
3. Risk Level 1 dischargers shall clean streets in such a manner as to prevent unauthorized non-storm water discharges from reaching surface water or MS4 drainage systems.

**D. Erosion Control**

1. Risk Level 1 dischargers shall implement effective wind erosion control.
2. Risk Level 1 dischargers shall provide effective soil cover for inactive<sup>1</sup> areas and all finished slopes, open space, utility backfill, and completed lots.
3. Risk Level 1 dischargers shall limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Where plastic materials are deemed necessary, the discharger shall consider the use of plastic materials resistant to solar degradation.

**E. Sediment Controls**

1. Risk Level 1 dischargers shall establish and maintain effective perimeter controls and stabilize all construction entrances and exits to sufficiently control erosion and sediment discharges from the site.
2. On sites where sediment basins are to be used, Risk Level 1 dischargers shall, at minimum, design sediment basins according to the method provided in CASQA's Construction BMP Guidance Handbook.

**F. Run-on and Runoff Controls**

Risk Level 1 dischargers shall effectively manage all run-on, all runoff within the site and all runoff that discharges off the site. Run-on from off site shall be directed away from all disturbed areas or shall collectively be in compliance with the effluent limitations in this General Permit.

**G. Inspection, Maintenance and Repair**

1. Risk Level 1 dischargers shall ensure that all inspection, maintenance repair and sampling activities at the project location shall be performed or supervised by a Qualified SWPPP Practitioner (QSP) representing the discharger. The QSP may delegate any or all of these activities to an employee trained to do the task(s) appropriately, but shall ensure adequate deployment.
2. Risk Level 1 dischargers shall perform weekly inspections and observations, and at least once each 24-hour period during extended

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<sup>1</sup> Inactive areas of construction are areas of construction activity that have been disturbed and are not scheduled to be re-disturbed for at least 14 days.

storm events, to identify and record BMPs that need maintenance to operate effectively, that have failed, or that could fail to operate as intended. Inspectors shall be the QSP or be trained by the QSP.

3. Upon identifying failures or other shortcomings, as directed by the QSP, Risk Level 1 dischargers shall begin implementing repairs or design changes to BMPs within 72 hours of identification and complete the changes as soon as possible.
4. For each inspection required, Risk Level 1 dischargers shall complete an inspection checklist, using a form provided by the State Water Board or Regional Water Board or in an alternative format.
5. Risk Level 1 dischargers shall ensure that checklists shall remain onsite with the SWPPP and at a minimum, shall include:
  - a. Inspection date and date the inspection report was written.
  - b. Weather information, including presence or absence of precipitation, estimate of beginning of qualifying storm event, duration of event, time elapsed since last storm, and approximate amount of rainfall in inches.
  - c. Site information, including stage of construction, activities completed, and approximate area of the site exposed.
  - d. A description of any BMPs evaluated and any deficiencies noted.
  - e. If the construction site is safely accessible during inclement weather, list the observations of all BMPs: erosion controls, sediment controls, chemical and waste controls, and non-storm water controls. Otherwise, list the results of visual inspections at all relevant outfalls, discharge points, downstream locations and any projected maintenance activities.
  - f. Report the presence of noticeable odors or of any visible sheen on the surface of any discharges.
  - g. Any corrective actions required, including any necessary changes to the SWPPP and the associated implementation dates.
  - h. Photographs taken during the inspection, if any.
  - i. Inspector's name, title, and signature.

**H. Rain Event Action Plan**

Not required for Risk Level 1 dischargers.

## I. Risk Level 1 Monitoring and Reporting Requirements

Table 1- Summary of Monitoring Requirements

Risk Level	Visual Inspections					Sample Collection	
	Quarterly Non-storm Water Discharge	Pre-storm Event		Daily Storm BMP	Post Storm	Storm Water Discharge	Receiving Water
		Baseline	REAP				
1	X	X		X	X		

### 1. Construction Site Monitoring Program Requirements

- a. Pursuant to Water Code Sections 13383 and 13267, all dischargers subject to this General Permit shall develop and implement a written site-specific Construction Site Monitoring Program (CSMP) in accordance with the requirements of this Section. The CSMP shall include all monitoring procedures and instructions, location maps, forms, and checklists as required in this section. The CSMP shall be developed prior to the commencement of construction activities, and revised as necessary to reflect project revisions. The CSMP shall be a part of the Storm Water Pollution Prevention Plan (SWPPP), included as an appendix or separate SWPPP chapter.
- b. Existing dischargers registered under the State Water Board Order No. 99-08-DWQ shall make and implement necessary revisions to their Monitoring Programs to reflect the changes in this General Permit in a timely manner, but no later than July 1, 2010. Existing dischargers shall continue to implement their existing Monitoring Programs in compliance with State Water Board Order No. 99-08-DWQ until the necessary revisions are completed according to the schedule above.
- c. When a change of ownership occurs for all or any portion of the construction site prior to completion or final stabilization, the new discharger shall comply with these requirements as of the date the ownership change occurs.

### 2. Objectives

The CSMP shall be developed and implemented to address the following objectives:

- a. To demonstrate that the site is in compliance with the Discharge Prohibitions;

- b. To determine whether non-visible pollutants are present at the construction site and are causing or contributing to exceedances of water quality objectives;
  - c. To determine whether immediate corrective actions, additional Best Management Practice (BMP) implementation, or SWPPP revisions are necessary to reduce pollutants in storm water discharges and authorized non-storm water discharges; and
  - d. To determine whether BMPs included in the SWPPP are effective in preventing or reducing pollutants in storm water discharges and authorized non-storm water discharges.
- 3. Risk Level 1 - Visual Monitoring (Inspection) Requirements for Qualifying Rain Events**
- a. Risk Level 1 dischargers shall visually observe (inspect) storm water discharges at all discharge locations within two business days (48 hours) after each qualifying rain event.
  - b. Risk Level 1 dischargers shall visually observe (inspect) the discharge of stored or contained storm water that is derived from and discharged subsequent to a qualifying rain event producing precipitation of ½ inch or more at the time of discharge. Stored or contained storm water that will likely discharge after operating hours due to anticipated precipitation shall be observed prior to the discharge during operating hours.
  - c. Risk Level 1 dischargers shall conduct visual observations (inspections) during business hours only.
  - d. Risk Level 1 dischargers shall record the time, date and rain gauge reading of all qualifying rain events.
  - e. Within 2 business days (48 hours) prior to each qualifying rain event, Risk Level 1 dischargers shall visually observe (inspect):
    - i. All storm water drainage areas to identify any spills, leaks, or uncontrolled pollutant sources. If needed, the discharger shall implement appropriate corrective actions.
    - ii. All BMPs to identify whether they have been properly implemented in accordance with the SWPPP. If needed, the discharger shall implement appropriate corrective actions.

- iii. Any storm water storage and containment areas to detect leaks and ensure maintenance of adequate freeboard.
- f. For the visual observations (inspections) described in e.i and e.iii above, Risk Level 1 dischargers shall observe the presence or absence of floating and suspended materials, a sheen on the surface, discolorations, turbidity, odors, and source(s) of any observed pollutants.
- g. Within two business days (48 hours) after each qualifying rain event, Risk Level 1 dischargers shall conduct post rain event visual observations (inspections) to (1) identify whether BMPs were adequately designed, implemented, and effective, and (2) identify additional BMPs and revise the SWPPP accordingly.
- h. Risk Level 1 dischargers shall maintain on-site records of all visual observations (inspections), personnel performing the observations, observation dates, weather conditions, locations observed, and corrective actions taken in response to the observations.

#### **4. Risk Level 1 – Visual Observation Exemptions**

- a. Risk Level 1 dischargers shall be prepared to conduct visual observation (inspections) until the minimum requirements of Section I.3 above are completed. Risk Level 1 dischargers are not required to conduct visual observation (inspections) under the following conditions:
  - i. During dangerous weather conditions such as flooding and electrical storms.
  - ii. Outside of scheduled site business hours.
- b. If no required visual observations (inspections) are collected due to these exceptions, Risk Level 1 dischargers shall include an explanation in their SWPPP and in the Annual Report documenting why the visual observations (inspections) were not conducted.

#### **5. Risk Level 1 – Monitoring Methods**

Risk Level 1 dischargers shall include a description of the visual observation locations, visual observation procedures, and visual observation follow-up and tracking procedures in the CSMP.

#### **6. Risk Level 1 – Non-Storm Water Discharge Monitoring Requirements**



- a. Visual Monitoring Requirements:
  - i. Risk Level 1 dischargers shall visually observe (inspect) each drainage area for the presence of (or indications of prior) unauthorized and authorized non-storm water discharges and their sources.
  - ii. Risk Level 1 dischargers shall conduct one visual observation (inspection) quarterly in each of the following periods: January-March, April-June, July-September, and October-December. Visual observation (inspections) are only required during daylight hours (sunrise to sunset).
  - iii. Risk Level 1 dischargers shall ensure that visual observations (inspections) document the presence or evidence of any non-storm water discharge (authorized or unauthorized), pollutant characteristics (floating and suspended material, sheen, discoloration, turbidity, odor, etc.), and source. Risk Level 1 dischargers shall maintain on-site records indicating the personnel performing the visual observation (inspections), the dates and approximate time each drainage area and non-storm water discharge was observed, and the response taken to eliminate unauthorized non-storm water discharges and to reduce or prevent pollutants from contacting non-storm water discharges.

#### **7. Risk Level 1 – Non-Visible Pollutant Monitoring Requirements**

- a. Risk Level 1 dischargers shall collect one or more samples during any breach, malfunction, leakage, or spill observed during a visual inspection which could result in the discharge of pollutants to surface waters that would not be visually detectable in storm water.
- b. Risk Level 1 dischargers shall ensure that water samples are large enough to characterize the site conditions.
- c. Risk Level 1 dischargers shall collect samples at all discharge locations that can be safely accessed.
- d. Risk Level 1 dischargers shall collect samples during the first two hours of discharge from rain events that occur during business hours and which generate runoff.
- e. Risk Level 1 dischargers shall analyze samples for all non-visible pollutant parameters (if applicable) - parameters indicating the

presence of pollutants identified in the pollutant source assessment required (Risk Level 1 dischargers shall modify their CSMPs to address these additional parameters in accordance with any updated SWPPP pollutant source assessment).

- f. Risk Level 1 dischargers shall collect a sample of storm water that has not come in contact with the disturbed soil or the materials stored or used on-site (uncontaminated sample) for comparison with the discharge sample.
- g. Risk Level 1 dischargers shall compare the uncontaminated sample to the samples of discharge using field analysis or through laboratory analysis.<sup>2</sup>
- h. Risk Level 1 dischargers shall keep all field /or analytical data in the SWPPP document.

#### **8. Risk Level 1 – Particle Size Analysis for Project Risk Justification**

Risk Level 1 dischargers justifying an alternative project risk shall report a soil particle size analysis used to determine the RUSLE K-Factor. ASTM D-422 (Standard Test Method for Particle-Size Analysis of Soils), as revised, shall be used to determine the percentages of sand, very fine sand, silt, and clay on the site.

#### **9. Risk Level 1 – Records**

Risk Level 1 dischargers shall retain records of all storm water monitoring information and copies of all reports (including Annual Reports) for a period of at least three years. Risk Level 1 dischargers shall retain all records on-site while construction is ongoing. These records include:

- a. The date, place, time of facility inspections, sampling, visual observation (inspections), and/or measurements, including precipitation.
- b. The individual(s) who performed the facility inspections, sampling, visual observation (inspections), and or measurements.
- c. The date and approximate time of analyses.
- d. The individual(s) who performed the analyses.

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<sup>2</sup> For laboratory analysis, all sampling, sample preservation, and analyses must be conducted according to test procedures under 40 CFR Part 136. Field discharge samples shall be collected and analyzed according to the specifications of the manufacturer of the sampling devices employed.

- e. A summary of all analytical results from the last three years, the method detection limits and reporting units, and the analytical techniques or methods used.
- f. Rain gauge readings from site inspections.
- g. Quality assurance/quality control records and results.
- h. Non-storm water discharge inspections and visual observation (inspections) and storm water discharge visual observation records (see Sections I.3 and I.6 above).
- i. Visual observation and sample collection exception records (see Section I.4 above).
- j. The records of any corrective actions and follow-up activities that resulted from analytical results, visual observation (inspections), or inspections.

## APPENDIX 5: Glossary

### **Active Areas of Construction**

All areas subject to land surface disturbance activities related to the project including, but not limited to, project staging areas, immediate access areas and storage areas. All previously active areas are still considered active areas until final stabilization is complete. [The construction activity Phases used in this General Permit are the Preliminary Phase, Grading and Land Development Phase, Streets and Utilities Phase, and the Vertical Construction Phase.]

### **Active Treatment System (ATS)**

A treatment system that employs chemical coagulation, chemical flocculation, or electrocoagulation to aid in the reduction of turbidity caused by fine suspended sediment.

### **Acute Toxicity Test**

A chemical stimulus severe enough to rapidly induce a negative effect; in aquatic toxicity tests, an effect observed within 96 hours or less is considered acute.

### **Air Deposition**

Airborne particulates from construction activities.

### **Approved Signatory**

A person who has been authorized by the Legally Responsible Person to sign, certify, and electronically submit Permit Registration Documents, Notices of Termination, and any other documents, reports, or information required by the General Permit, the State or Regional Water Board, or U.S. EPA. The Approved Signatory must be one of the following:

1. For a corporation or limited liability company: a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (a) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation or limited liability company; or (b) the manager of the facility if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;
2. For a partnership or sole proprietorship: a general partner or the proprietor, respectively;
3. For a municipality, State, Federal, or other public agency: a principal executive officer, ranking elected official, city manager, council president, or any other authorized public employee with managerial responsibility over the

construction or land disturbance project (including, but not limited to, project manager, project superintendent, or resident engineer);

4. For the military: any military officer or Department of Defense civilian, acting in an equivalent capacity to a military officer, who has been designated;
5. For a public university: an authorized university official;
6. For an individual: the individual, because the individual acts as both the Legally Responsible Person and the Approved Signatory; or
7. For any type of entity not listed above (e.g. trusts, estates, receivers): an authorized person with managerial authority over the construction or land disturbance project.

### **Beneficial Uses**

As defined in the California Water Code, beneficial uses of the waters of the state that may be protected against quality degradation include, but are not limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.

### **Best Available Technology Economically Achievable (BAT)**

As defined by USEPA, BAT is a technology-based standard established by the Clean Water Act (CWA) as the most appropriate means available on a national basis for controlling the direct discharge of toxic and nonconventional pollutants to navigable waters. The BAT effluent limitations guidelines, in general, represent the best existing performance of treatment technologies that are economically achievable within an industrial point source category or subcategory.

### **Best Conventional Pollutant Control Technology (BCT)**

As defined by USEPA, BCT is a technology-based standard for the discharge from existing industrial point sources of conventional pollutants including biochemical oxygen demand (BOD), total suspended sediment (TSS), fecal coliform, pH, oil and grease.

### **Best Professional Judgment (BPJ)**

The method used by permit writers to develop technology-based NPDES permit conditions on a case-by-case basis using all reasonably available and relevant data.

### **Best Management Practices (BMPs)**

BMPs are scheduling of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants. BMPs also include treatment requirements, operating procedures,

and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

**Chain of Custody (COC)**

Form used to track sample handling as samples progress from sample collection to the analytical laboratory. The COC is then used to track the resulting analytical data from the laboratory to the client. COC forms can be obtained from an analytical laboratory upon request.

**Coagulation**

The clumping of particles in a discharge to settle out impurities, often induced by chemicals such as lime, alum, and iron salts.

**Common Plan of Development**

Generally a contiguous area where multiple, distinct construction activities may be taking place at different times under one plan. A plan is generally defined as any piece of documentation or physical demarcation that indicates that construction activities may occur on a common plot. Such documentation could consist of a tract map, parcel map, demolition plans, grading plans or contract documents. Any of these documents could delineate the boundaries of a common plan area. However, broad planning documents, such as land use master plans, conceptual master plans, or broad-based CEQA or NEPA documents that identify potential projects for an agency or facility are not considered common plans of development.

**Daily Average Discharge**

The discharge of a pollutant measured during any 24-hour period that reasonably represents a calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged during the day. For pollutants with limitations expressed in other units of measurement (e.g., concentration) the daily discharge is calculated as the average measurement of the pollutant throughout the day (40 CFR 122.2). In the case of pH, the pH must first be converted from a log scale.

**Debris**

Litter, rubble, discarded refuse, and remains of destroyed inorganic anthropogenic waste.

**Direct Discharge**

A discharge that is routed directly to waters of the United States by means of a pipe, channel, or ditch (including a municipal storm sewer system), or through surface runoff.

**Discharger**

The Legally Responsible Person (see definition) or entity subject to this General Permit.

**Dose Rate (for ATS)**

In exposure assessment, dose (e.g. of a chemical) per time unit (e.g. mg/day), sometimes also called dosage.

**Drainage Area**

The area of land that drains water, sediment, pollutants, and dissolved materials to a common outlet.

**Effluent**

Any discharge of water by a discharger either to the receiving water or beyond the property boundary controlled by the discharger.

**Effluent Limitation**

Any numeric or narrative restriction imposed on quantities, discharge rates, and concentrations of pollutants which are discharged from point sources into waters of the United States, the waters of the contiguous zone, or the ocean.

**Erosion**

The process, by which soil particles are detached and transported by the actions of wind, water, or gravity.

**Erosion Control BMPs**

Vegetation, such as grasses and wildflowers, and other materials, such as straw, fiber, stabilizing emulsion, protective blankets, etc., placed to stabilize areas of disturbed soils, reduce loss of soil due to the action of water or wind, and prevent water pollution.

**Field Measurements**

Testing procedures performed in the field with portable field-testing kits or meters.

**Final Stabilization**

All soil disturbing activities at each individual parcel within the site have been completed in a manner consistent with the requirements in this General Permit.

**First Order Stream**

Stream with no tributaries.

**Flocculants**

Substances that interact with suspended particles and bind them together to form flocs.

**Good Housekeeping BMPs**

BMPs designed to reduce or eliminate the addition of pollutants to construction site runoff through analysis of pollutant sources, implementation of proper handling/disposal practices, employee education, and other actions.

**Grading Phase (part of the Grading and Land Development Phase)**

Includes reconfiguring the topography and slope including; alluvium removals; canyon cleanouts; rock undercuts; keyway excavations; land form grading; and stockpiling of select material for capping operations.

**Hydromodification**

Hydromodification is the alteration of the hydrologic characteristics of coastal and non-coastal waters, which in turn could cause degradation of water resources. Hydromodification can cause excessive erosion and/or sedimentation rates, causing excessive turbidity, channel aggradation and/or degradation.

**Identified Organisms**

Organisms within a sub-sample that is specifically identified and counted.

**Inactive Areas of Construction**

Areas of construction activity that are not active and those that have been active and are not scheduled to be re-disturbed for at least 14 days.

**Index Period**

The period of time during which bioassessment samples must be collected to produce results suitable for assessing the biological integrity of streams and rivers. Instream communities naturally vary over the course of a year, and sampling during the index period ensures that samples are collected during a time frame when communities are stable so that year-to-year consistency is obtained. The index period approach provides a cost-effective alternative to year-round sampling. Furthermore, sampling within the appropriate index period will yield results that are comparable to the assessment thresholds or criteria for a given region, which are established for the same index period. Because index periods differ for different parts of the state, it is essential to know the index period for your area.

**K Factor**

The soil erodibility factor used in the Revised Universal Soil Loss Equation (RUSLE). It represents the combination of detachability of the soil, runoff potential of the soil, and the transportability of the sediment eroded from the soil.

**Legally Responsible Person**

The Legally Responsible Person (LRP) will typically be the project proponent. The categories of persons or entities that are eligible to serve as the LRP are set forth below. For any construction or land disturbance project where multiple persons or entities are eligible to serve as the LRP, those persons or entities



shall select a single LRP. In exceptional circumstances, a person or entity that qualifies as the LRP may provide written authorization to another person or entity to serve as the LRP. In such a circumstance, the person or entity that provides the authorization retains all responsibility for compliance with the General Permit. Except as provided in category 2(d), a contractor who does not satisfy the requirements of any of the categories below is not qualified to be an LRP.

The following persons or entities may serve as an LRP:

1. A person, company, agency, or other entity that possesses a real property interest (including, but not limited to, fee simple ownership, easement, leasehold, or other rights of way) in the land upon which the construction or land disturbance activities will occur for the regulated site.
2. In addition to the above, the following persons or entities may also serve as an LRP:
  - a. For linear underground/overhead projects, the utility company, municipality, or other public or private company or agency that owns or operates the LUP;
  - b. For land controlled by an estate or similar entity, the person who has day-to-day control over the land (including, but not limited to, a bankruptcy trustee, receiver, or conservator);
  - c. For pollution investigation and remediation projects, any potentially responsible party that has received permission to conduct the project from the holder of a real property interest in the land; or
  - d. For U.S. Army Corp of Engineers projects, the U.S. Army Corps of Engineers may provide written authorization to its bonded contractor to serve as the LRP, provided, however, that the U.S. Army Corps of Engineers is also responsible for compliance with the general permit, as authorized by the Clean Water Act or the Federal Facilities Compliance Act.

#### **Likely Precipitation Event**

Any weather pattern that is forecasted to have a 50% or greater chance of producing precipitation in the project area. The discharger shall obtain likely precipitation forecast information from the National Weather Service Forecast Office (e.g., by entering the zip code of the project's location at <http://www.srh.noaa.gov/forecast>).

#### **Maximum Allowable Threshold Concentration (MATC)**

The allowable concentration of residual, or dissolved, coagulant/flocculant in effluent. The MATC shall be coagulant/flocculant-specific, and based on toxicity

testing conducted by an independent, third-party laboratory. A typical MATC would be:

The MATC is equal to the geometric mean of the NOEC (No Observed Effect Concentration) and LOEC (Lowest Observed Effect Concentration) Acute and Chronic toxicity results for most sensitive species determined for the specific coagulant. The most sensitive species test shall be used to determine the MATC.

### **Natural Channel Evolution**

The physical trend in channel adjustments following a disturbance that causes the river to have more energy and degrade or aggrade more sediment. Channels have been observed to pass through 5 to 9 evolution types. Once they pass through the suite of evolution stages, they will rest in a new state of equilibrium.

### **Non-Storm Water Discharges**

Discharges are discharges that do not originate from precipitation events. They can include, but are not limited to, discharges of process water, air conditioner condensate, non-contact cooling water, vehicle wash water, sanitary wastes, concrete washout water, paint wash water, irrigation water, or pipe testing water.

### **Non-Visible Pollutants**

Pollutants associated with a specific site or activity that can have a negative impact on water quality, but cannot be seen through observation (ex: chlorine). Such pollutants being discharged are not authorized.

### **Numeric Action Level (NAL)**

Level is used as a warning to evaluate if best management practices are effective and take necessary corrective actions. Not an effluent limit.

### **Original Sample Material**

The material (i.e., macroinvertebrates, organic material, gravel, etc.) remaining after the subsample has been removed for identification.

### **pH**

Unit universally used to express the intensity of the acid or alkaline condition of a water sample. The pH of natural waters tends to range between 6 and 9, with neutral being 7. Extremes of pH can have deleterious effects on aquatic systems.

### **Post-Construction BMPs**

Structural and non-structural controls which detain, retain, or filter the release of pollutants to receiving waters after final stabilization is attained.

**Preliminary Phase (Pre-Construction Phase - Part of the Grading and Land Development Phase)**

Construction stage including rough grading and/or disking, clearing and grubbing operations, or any soil disturbance prior to mass grading.

**Project****Qualified SWPPP Developer**

Individual who is authorized to develop and revise SWPPPs.

**Qualified SWPPP Practitioner**

Individual assigned responsibility for non-storm water and storm water visual observations, sampling and analysis, and responsibility to ensure full compliance with the permit and implementation of all elements of the SWPPP, including the preparation of the annual compliance evaluation and the elimination of all unauthorized discharges.

**Qualifying Rain Event**

Any event that produces 0.5 inches or more precipitation with a 48 hour or greater period between rain events.

**R Factor**

Erosivity factor used in the Revised Universal Soil Loss Equation (RUSLE). The R factor represents the erosivity of the climate at a particular location. An average annual value of R is determined from historical weather records using erosivity values determined for individual storms. The erosivity of an individual storm is computed as the product of the storm's total energy, which is closely related to storm amount, and the storm's maximum 30-minute intensity.

**Rain Event Action Plan (REAP)**

Written document, specific for each rain event, that when implemented is designed to protect all exposed portions of the site within 48 hours of any likely precipitation event.

**Remaining Sub sampled Material**

The material (e.g., organic material, gravel, etc.) that remains after the organisms to be identified have been removed from the subsample for identification. (Generally, no macroinvertebrates are present in the remaining subsampled material, but the sample needs to be checked and verified using a complete Quality Assurance (QA) plan)

**Routine Maintenance**

Activities intended to maintain the original line and grade, hydraulic capacity, or original purpose of a facility.

**Runoff Control BMPs**

Measures used to divert runoff from offsite and runoff within the site.

**Run-on**

Discharges that originate offsite and flow onto the property of a separate project site.

**Revised Universal Soil Loss Equation (RUSLE)**

Empirical model that calculates average annual soil loss as a function of rainfall and runoff erosivity, soil erodibility, topography, erosion controls, and sediment controls.

**Sampling and Analysis Plan**

Document that describes how the samples will be collected, under what conditions, where and when the samples will be collected, what the sample will be tested for, what test methods and detection limits will be used, and what methods/procedures will be maintained to ensure the integrity of the sample during collection, storage, shipping and testing (i.e., quality assurance/quality control protocols).

**Sediment**

Solid particulate matter, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water, gravity, or ice and has come to rest on the earth's surface either above or below sea level.

**Sedimentation**

Process of deposition of suspended matter carried by water, wastewater, or other liquids, by gravity. It is usually accomplished by reducing the velocity of the liquid below the point at which it can transport the suspended material.

**Sediment Control BMPs**

Practices that trap soil particles after they have been eroded by rain, flowing water, or wind. They include those practices that intercept and slow or detain the flow of storm water to allow sediment to settle and be trapped (e.g., silt fence, sediment basin, fiber rolls, etc.).

**Settleable Solids (SS)**

Solid material that can be settled within a water column during a specified time frame. It is typically tested by placing a water sample into an Imhoff settling cone and then allowing the solids to settle by gravity for a given length of time. Results are reported either as a volume (mL/L) or a mass (mg/L) concentration.

**Sheet Flow**

Flow of water that occurs overland in areas where there are no defined channels where the water spreads out over a large area at a uniform depth.

**Site****Soil Amendment**

Any material that is added to the soil to change its chemical properties, engineering properties, or erosion resistance that could become mobilized by storm water.

**Streets and Utilities Phase**

Construction stage including excavation and street paving, lot grading, curbs, gutters and sidewalks, public utilities, public water facilities including fire hydrants, public sanitary sewer systems, storm sewer system and/or other drainage improvements.

**Structural Controls**

Any structural facility designed and constructed to mitigate the adverse impacts of storm water and urban runoff pollution

**Suspended Sediment Concentration (SSC)**

The measure of the concentration of suspended solid material in a water sample by measuring the dry weight of all of the solid material from a known volume of a collected water sample. Results are reported in mg/L.

**Total Suspended Solids (TSS)**

The measure of the suspended solids in a water sample includes inorganic substances, such as soil particles and organic substances, such as algae, aquatic plant/animal waste, particles related to industrial/sewage waste, etc. The TSS test measures the concentration of suspended solids in water by measuring the dry weight of a solid material contained in a known volume of a sub-sample of a collected water sample. Results are reported in mg/L.

**Toxicity**

The adverse response(s) of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies.

**Turbidity**

The cloudiness of water quantified by the degree to which light traveling through a water column is scattered by the suspended organic and inorganic particles it contains. The turbidity test is reported in Nephelometric Turbidity Units (NTU) or Jackson Turbidity Units (JTU).

**Vertical Construction Phase**

The Build out of structures from foundations to roofing, including rough landscaping.

**Waters of the United States**

Generally refers to surface waters, as defined by the federal Environmental Protection Agency in 40 C.F.R. § 122.2.<sup>1</sup>

**Water Quality Objectives (WQO)**

Water quality objectives are defined in the California Water Code as limits or levels of water quality constituents or characteristics, which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area.

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<sup>1</sup> The application of the definition of “waters of the United States” may be difficult to determine; there are currently several judicial decisions that create some confusion. If a landowner is unsure whether the discharge must be covered by this General Permit, the landowner may wish to seek legal advice.

## APPENDIX 6: Acronym List

ASBS	Areas of Special Biological Significance
ASTM	American Society of Testing and Materials; Standard Test Method for Particle-Size Analysis of Soils
ATS	Active Treatment System
BASMAA	Bay Area Storm water Management Agencies Association
BAT	Best Available Technology Economically Achievable
BCT	Best Conventional Pollutant Control Technology
BMP	Best Management Practices
BOD	Biochemical Oxygen Demand
BPJ	Best Professional Judgment
CAFO	Confined Animal Feeding Operation
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CGP	NPDES General Permit for Storm Water Discharges Associated with Construction Activities
CIWQS	California Integrated Water Quality System
CKD	Cement Kiln Dust
COC	Chain of Custody
CPESC	Certified Professional in Erosion and Sediment Control
CPSWQ	Certified Professional in Storm Water Quality
CSMP	Construction Site Monitoring Program
CTB	Cement Treated Base
CTR	California Toxics Rule
CWA	Clean Water Act
CWC	California Water Code
CWP	Center for Watershed Protection
DADMAC	Diallyldimethyl-ammonium chloride
DDNR	Delaware Department of Natural Resources
DFG	Department of Fish and Game
DHS	Department of Health Services
DWQ	Division of Water Quality
EC	Electrical Conductivity
ELAP	Environmental Laboratory Accreditation Program
EPA	Environmental Protection Agency
ESA	Environmentally Sensitive Area
ESC	Erosion and Sediment Control
HSPF	Hydrologic Simulation Program Fortran
JTU	Jackson Turbidity Units
LID	Low Impact Development
LOEC	Lowest Observed Effect Concentration
LRP	Legally Responsible Person
LUP	Linear Underground/Overhead Projects

MATC	Maximum Allowable Threshold Concentration
MDL	Method Detection Limits
MRR	Monitoring and Reporting Requirements
MS4	Municipal Separate Storm Sewer System
MUSLE	Modified Universal Soil Loss Equation
NAL	Numeric Action Level
NEL	Numeric Effluent Limitation
NICET	National Institute for Certification in Engineering Technologies
NOAA	National Oceanic and Atmospheric Administration
NOEC	No Observed Effect Concentration
NOI	Notice of Intent
NOT	Notice of Termination
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NTR	National Toxics Rule
NTU	Nephelometric Turbidity Units
O&M	Operation and Maintenance
PAC	Polyaluminum chloride
PAM	Polyacrylamide
PASS	Polyaluminum chloride Silica/sulfate
POC	Pollutants of Concern
PoP	Probability of Precipitation
POTW	Publicly Owned Treatment Works
PRDs	Permit Registration Documents
PWS	Planning Watershed
QAMP	Quality Assurance Management Plan
QA/QC	Quality Assurance/Quality Control
REAP	Rain Event Action Plan
Regional Board	Regional Water Quality Control Board
ROWD	Report of Waste Discharge
RUSLE	Revised Universal Soil Loss Equation
RW	Receiving Water
SMARTS System	Storm water Multi Application Reporting and Tracking System
SS	Settleable Solids
SSC	Suspended Sediment Concentration
SUSMP	Standard Urban Storm Water Mitigation Plan
SW	Storm Water
SWARM	Storm Water Annual Report Module
SWAMP	Surface Water Ambient Monitoring Program
SWMM	Storm Water Management Model
SWMP	Storm Water Management Program
SWPPP	Storm Water Pollution Prevention Plan
TC	Treatment Control
TDS	Total Dissolved Solids



TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
USACOE	U.S. Army Corps of Engineers
USC	United States Code
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WDID	Waste Discharge Identification Number
WDR	Waste Discharge Requirements
WLA	Waste Load Allocation
WET	Whole Effluent Toxicity
WRCC	Western Regional Climate Center
WQBEL	Water Quality Based Effluent Limitation
WQO	Water Quality Objective
WQS	Water Quality Standard

## APPENDIX 7: State and Regional Water Resources Control Board Contacts

**NORTH COAST REGION (1)**  
5550 Skylane Blvd, Ste. A  
Santa Rose, CA 95403  
(707) 576-2220 FAX: (707)523-0135

**SAN FRANCISCO BAY REGION (2)**  
1515 Clay Street, Ste. 1400  
Oakland, CA 94612  
(510) 622-2300 FAX: (510) 622-2640

**CENTRAL COAST REGION (3)**  
895 Aerovista Place, Ste 101  
San Luis Obispo, CA 93401  
(805) 549-3147 FAX: (805) 543-0397

**LOS ANGELES REGION (4)**  
320 W. 4<sup>th</sup> Street, Ste. 200  
Los Angeles, CA 90013  
(213) 576-6600 FAX: (213) 576-6640

**LAHONTAN REGION (6 SLT)**  
2501 Lake Tahoe Blvd.  
South Lake Tahoe, CA 96150  
(530) 542-5400 FAX: (530) 544-2271

**VICTORVILLE OFFICE (6V)**  
14440 Civic Drive, Ste. 200  
Victorville, CA 92392-2383  
(760) 241-6583 FAX: (760) 241-7308

**CENTRAL VALLEY REGION (5S)**  
11020 Sun Center Dr., #200  
Rancho Cordova, CA 95670-6114  
(916) 464-3291 FAX: (916) 464-4645

**FRESNO BRANCH OFFICE (5F)**  
1685 E St.  
Fresno, CA 93706  
(559) 445-5116 FAX: (559) 445-5910

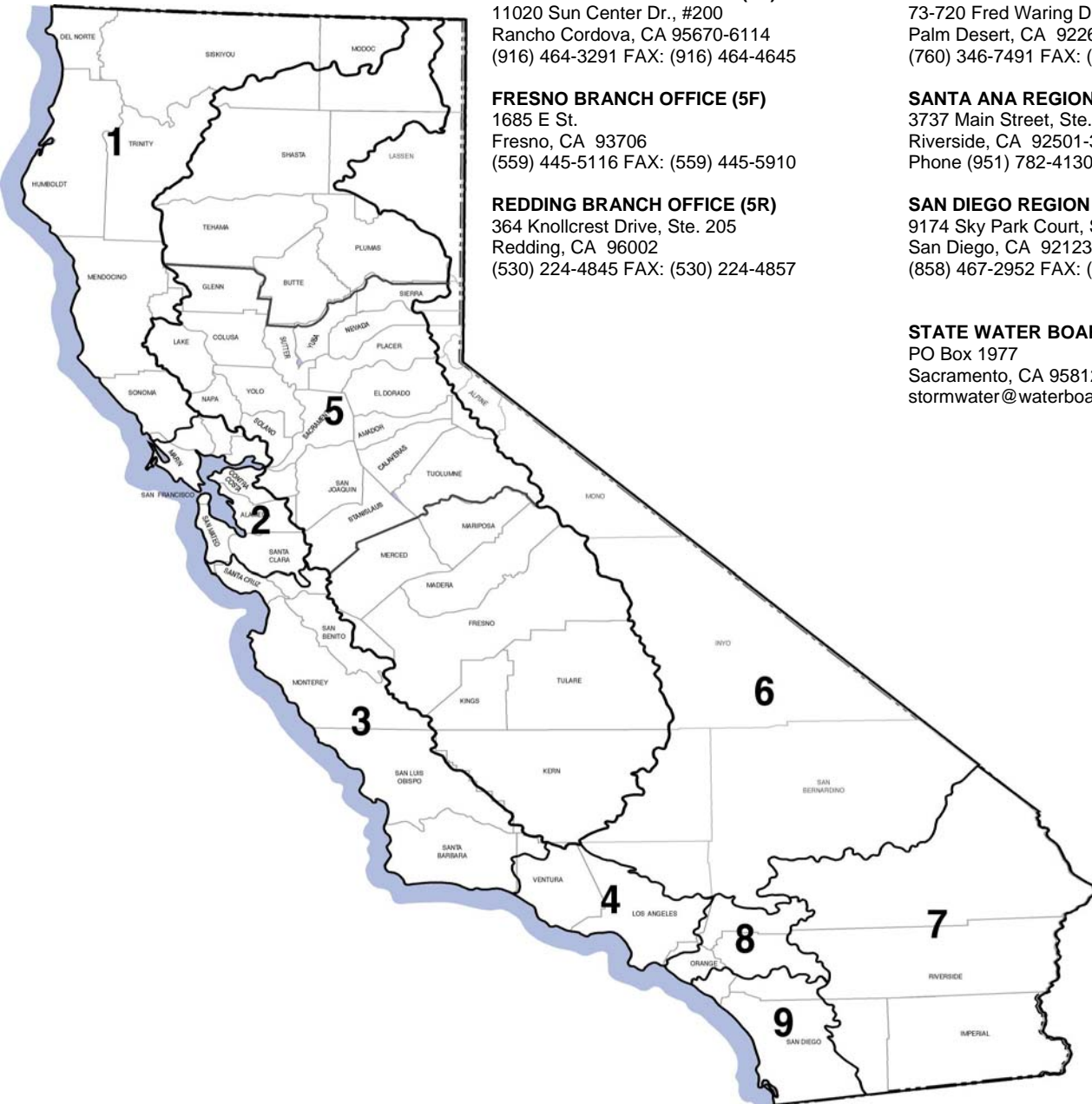
**REDDING BRANCH OFFICE (5R)**  
364 Knollcrest Drive, Ste. 205  
Redding, CA 96002  
(530) 224-4845 FAX: (530) 224-4857

**COLORADO RIVER BASIN REGION (7)**  
73-720 Fred Waring Dr., Ste. 100  
Palm Desert, CA 92260  
(760) 346-7491 FAX: (760) 341-6820

**SANTA ANA REGION (8)**  
3737 Main Street, Ste. 500  
Riverside, CA 92501-3339  
Phone (951) 782-4130 FAX: (951) 781-6288

**SAN DIEGO REGION (9)**  
9174 Sky Park Court, Ste. 100  
San Diego, CA 92123-4340  
(858) 467-2952 FAX: (858) 571-6972

**STATE WATER BOARD**  
PO Box 1977  
Sacramento, CA 95812-1977  
stormwater@waterboards.ca.gov





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**APPENDIX O**

Visual Inspection and Sampling Field Log Sheet

**SAMPLING FIELD LOG SHEET**

Construction Site Name: Keeler Dunes	Date:	Time Start:
--------------------------------------	-------	-------------

Sampler:

Sampling Event Type:	<input type="checkbox"/> Stormwater	<input type="checkbox"/> Non-storm water	<input type="checkbox"/> Non-visible pollutant	<input type="checkbox"/> Other (specify)
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**Field Meter Calibration**

pH Meter ID No./Desc.: Calibration Date/Time:	Turbidity Meter ID No./Desc.: Calibration Date/Time:
Or Laboratory Name if sending samples:	Or Laboratory name if sending samples:

**Field pH and Turbidity Measurements**

Discharge Location Description	pH	Turbidity	Time

**Grab Samples Collected**

Sample Location Description	Sample Type	Time

Additional Sampling Notes:

<b>Risk Level 1 Visual Inspection Field Log Sheet</b>						
Date and Time of Inspection:				Report Date:		
Inspection Type:	<input type="checkbox"/> Weekly	<input type="checkbox"/> Before predicted rain	<input type="checkbox"/> During rain event	<input type="checkbox"/> Following qualifying rain event	<input type="checkbox"/> Contained stormwater release	<input type="checkbox"/> Quarterly non-stormwater
<b>Site Information</b>						
Construction Site Name: Keeler Dunes						
Construction stage and completed activities:				Approximate area of exposed site:		
<b>Weather and Observations</b>						
Date Rain Predicted to Occur:				Predicted % chance of rain:		
Estimate storm beginning: _____ (date and time)		Estimate storm duration: _____ (hours)		Estimate time since last storm: _____ (days or hours)	Rain gauge reading: _____ (inches)	
Observations: If yes identify location						
Odors	Yes <input type="checkbox"/>	No <input type="checkbox"/>				
Floating material	Yes <input type="checkbox"/>	No <input type="checkbox"/>				
Suspended Material	Yes <input type="checkbox"/>	No <input type="checkbox"/>				
Sheen	Yes <input type="checkbox"/>	No <input type="checkbox"/>				
Discolorations	Yes <input type="checkbox"/>	No <input type="checkbox"/>				
Turbidity	Yes <input type="checkbox"/>	No <input type="checkbox"/>				
<b>Site Inspections</b>						
<b>Outfalls or BMPs Evaluated</b>			<b>Deficiencies Noted</b>			
(add additional sheets or attached detailed BMP Inspection Checklists)						
Photos Taken:	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Photo Reference IDs:			
<b>Corrective Actions Identified (note if SWPPP/REAP change is needed)</b>						
<b>Inspector Information</b>						
Inspector Name:				Inspector Title:		
Signature:					Date:	

**Risk Level 2  
Effluent Sampling Field Log Sheets**

Construction Site Name:	Date:	Time Start:
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Sampler:

Sampling Event Type:	<input type="checkbox"/> Stormwater	<input type="checkbox"/> Non-stormwater	<input type="checkbox"/> Non-visible pollutant
----------------------	-------------------------------------	---	--

**Field Meter Calibration**

pH Meter ID No./Desc.:	Turbidity Meter ID No./Desc.:
Calibration Date/Time:	Calibration Date/Time:

**Field pH and Turbidity Measurements**

Discharge Location Description	pH	Turbidity	Time

**Grab Samples Collected**

Discharge Location Description	Sample Type	Time

Additional Sampling Notes:

Time End:

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## **RESTORATION PLAN**



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## Keeler Dunes Restoration Plan

Restoration of disturbed areas, including the staging areas and the temporary access routes, will occur at the end of the contract when the installed plants on the project site are established enough such that they do not need any supplemental watering. The temporary irrigation system will be removed from the project site, and the trunk line from the Keeler Community Services District well will be removed.

Restoration will include de-compaction of staging areas as needed, using a ripper or disk. After decompaction, the staging areas will be mechanically or manually smoothed. The areas will then be seeded with the recommended seed mixture shown in Table 1. Seed will be sourced from within the Owens Valley. The seed will be broadcast, and then raked in. both broadcasting and raking can be done by hand. Erosion control BMPs will remain in place, or will be repositioned, around the staging areas. Seeding will be appropriately timed for optimal germination, such as late fall or late winter/early spring.

The temporary access routes between the staging areas and the project area will not be de-compacted, but will be smoothed, seeded, and raked in the same manner as the staging areas.

Restoration will not be required along the temporary access routes within the project site, as the routes will have been established avoiding vegetation.

**Table 1.**  
**Seed Mix for Restoration**

<b>Species</b>	<b>Common Name</b>	<b>Pounds PLS per Acre</b>
<i>Atriplex parryii</i>	Parry saltbush	2
<i>Sarcobatus vermiculatus</i>	Greasewood	2
<i>Sueda moquinii</i>	Alkali seepweed	1
<i>Atriplex hymenoletra</i>	Holly-leaf saltbush	1
<i>Distichlis spicata</i>	Saltgrass	2
<i>Cleomella obtusifolium</i>	Mohave cleomella	1
<i>Achnatherum hymenoides</i>	Indian ricegrass	1

PLS = Pure Live Seed



## **WEED CONTROL PLAN**

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## Keeler Dunes Weed Control Plan

Construction of the proposed project / proposed action and alternatives requires implementation of this Weed Control Plan. Implementation begins upon commencement of construction activities, and continues for the life of the contract (through December 2017).

### Prevention Measures

- a. All landscaping and restoration seeds and plant materials shall be certified weed free. Plants delivered from the nursery will be inspected to assure that they are weed-free before being planted at the dune sites.
- b. All straw materials used in BMPs shall be certified weed free. Straw bales acquired by the District are certified weed-free.
- c. Selection of the temporary access route shall be done in a way that minimizes disturbance of vegetation. If weed species are found along the access route, they will be treated as described below before the access route is utilized.
- d. Areas of temporary disturbance shall be vegetated with local native plant species using the same methods as are used for the project itself as soon as construction is complete to reduce erosion and inhibit the establishment of invasive weeds (see Restoration Plan).
- 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 District and to BLM for inspection at any time and shall be submitted to the District and to BLM upon request.

### Weed-Control Measures

The pre-project undisturbed sites are relatively free of invasive weeds, and if reasonable precautions for limiting weed introduction to the site are taken, such plants should not become a great problem. Of concern in this area is Russian thistle (*Salsola* spp). The site will be evaluated for presence of this species prior to construction and subsequently during the months of March and April for the life of the project, through 2017. Where substantial populations are found, they will be treated by hand pulling (manual removal) or weed whipping (mechanical control). Remedial (follow-up) control measures shall be implemented by the Contractor under the direction of the District and of BLM if previous procedures have not achieved eradication or control objectives.

### Reporting

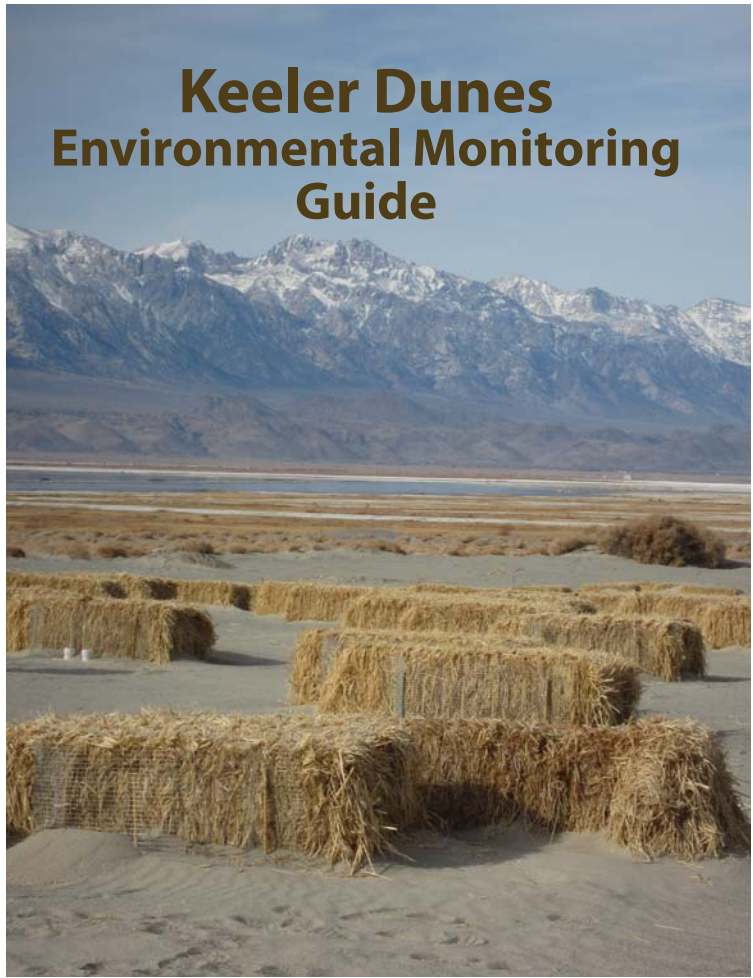
A final report shall be prepared for submittal to the BLM Bishop Field Office at the end of the project construction phase. The report shall document the implementation of the Weed Control Plan, including the outcome of the weed control measures and recommendations for changes to improve rates of success.



## **WORKER ENVIRONMENTAL AWARENESS PLAN**



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# Keeler Dunes Environmental Monitoring Guide

## General Environmental Measures

- All personnel entering the site must have environmental training certification, even visitors.
- Maintain 15-foot distance from posted sensitive areas and/or fenced areas.
- Follow Best Management Practices for all aspects of the project.
- 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
- When you have completed the Worker Environmental Awareness Program training (WEAP), affix the sticker to your hardhat, where it is visible at

## Other Requirements

- Small spotted squirrel with brownish cheeks and a white undertail. 3-inch tail with long feet, big eyes, small snout
- Desert scrub and alkali scrub
- Unlikely to occur due to limited suitable habitat
- Project is outside of known range



Mohave Ground Squirrel

## Mammals

- Animal is 2.3-3 feet long, mostly gray, with a grizzled effect. A white stripe from the nose leads between the eyes and back over the head of the badger, ending between the shoulders
- Open chaparral, grasslands, hot deserts, lives in burrows
- Determined to be present on project site based on literature and site characteristics



American Badger

## Birds

### California Horned Lark

- Slender with long wings, short and stout bill, square tail. Grey upperparts and white underparts, distinctive yellow and black mask and black collar. Summer males have tiny black "horns"
- Determined to be present on project site in scattered bushes
- Nests on ground



- Large, long-tailed, pale sandy gray all over. Long, down-curved bill. Dark tail. Pale reddish undertail.
- Determined to be present on project site in desert scrub, sparse shrubby areas. Nests in spiny shrubs



Le Conte's Thrasher



Bell's Sparrow



Southern Grasshopper Mouse

- Body 4-5 inches long; tail 2-3 inches; upper body gray or pinkish brown; underbody white including sparse shrubby areas
- Nocturnal
- Lives in small burrows

### Owens Valley Mole

- Small nocturnal rodent
- Unlikely to be present due to unsuitable habitat; prefers meadows to dunes





### Loggerhead Shrike

- Thick-bodied songbirds with large, blocky heads and a thick bill with a small hook. Tail is fairly long and rounded. Black mask and white flashes in the black wings. Grey head with wide, black mask, black bill, and white throat. The tail is black with white corners
- Determined to be present on project site in scattered shrubs
- Nest in thorny vegetation 2-4 feet above ground



### Northern Harrier

- Slim long-tailed hawk, wings in V-shape; white patch at base of tail; owl-like face; gray and white or brown
- Unlikely to occur on project site
- Nests on ground in well-concealed locations near low shrubs or in grass



## Plants

### Creamy Blazing Star (*Mentzelia tridentata*)

- Shiny creamy-white flowers; plant 4-10 inches tall
- Blooms April-May; habitat present on site



### Inyo County Star-Tulip (*Calochorus excavatus*)

- Alkaline meadows in saltbush scrub
- White petals with a dark purple base, and green stripes outside, 1 1/8 - 1 1/2 inches long.
- Blooms April-July
- Not found during surveys on site, but habitat present on site



### Sagebrush loeflingia (*Loeflingia squarrosa var. artemisiarum*)

- Desert dunes in Great Basin scrub
- Tiny prickly plant, leaves green-yellow
- Blooms April to May, not found during surveys on site



### Sanicle cympterus (*Cymopterus ripleyi var. saniculoides*)

- Joshua tree woodland and Mojavean desert scrub
- Tiny plant, green flower
- Blooms April-June
- Not found during surveys on site, but habitat present on site



### Booth's Evening Primrose (*Camissonia boothii ssp. boothii*)

- Joshua Tree and pinyon-juniper
- Nodding white petals 6-15 inches tall
- Blooms April – September
- Not found during surveys on site, but habitat present on site



### Naked Milk-vetch (*Astragalus serenoii ssp. shockleyi*)

- Desert sagebrush or pinyon
- Pink-purple pea-like flowers stripes outside, 1 1/8 - 1 1/2 inches long.
- Small bush to 18 inches tall
- Not found during surveys on site, but habitat present on site



### Lincoln Rock Cress (*Boechera lincolnensis*)

- Desert shrublands
- Deep pink four-petal flowers
- Slender plant 8-20 inches tall
- Blooms April
- Not found during surveys on site, but habitat present on site



### Nevada Oryctes (*Oryctes nevadensis*)

- Creosote bush scrub, saltbush scrub
- Small, branched plant, 2-9 inches tall
- Very small flower, purplish
- Not found during surveys on site, but habitat present on site



### Surface Water Quality

- Only water from the irrigation system may be discharged into the project area
- Any spills of oil, gasoline, or other potentially hazardous fluids must be cleaned up immediately and disposed of in a suitable manner off-site in conformance with the HMRP

### Avoidance of Drainages

- All access routes will avoid drainages when possible. No alteration of natural drainage patterns is permitted
- If an access route must cross a drainage, traffic shall remain within the 20-foot wide access route at all times. No material may be imported or moved out of a drainage
- Transmission pipes may cross a drainage but provision must be made for water to flow over or under the pipe so that the drainage pattern is not obstructed during storm events

### Air Quality and Dust Suppression

- ATVs and all vehicles shall be well-maintained and in good condition
- Speed limit in all areas, and for all vehicles including ATVs, is 15 mph

### Cultural Resource Concerns

- Avoid all areas flagged or otherwise identified as sensitive
- Conform with requests of cultural monitors for avoidance or restriction of vehicle traffic
- Collaborate with Tribal workers to assure that they have access to resources to conduct work in sensitive areas

### Human Remains

If you encounter any evidence of human remains, notify the Cultural Monitor or your supervisor immediately, and stop work in the area. The supervisor will notify the County Coroner at

**To be supplied when available to successful Contractor**

- LADWP Letter of Authorization for Land Use and Roadway Use
- Water Use Agreement with KCSD
- CalTrans Encroachment Permit
- BLM Land Use Permit

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# **ATTACHMENT B**

# **SPECIFICATIONS**

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## **Keeler Dunes Specifications Statement**

### **1. Irrigation System**

The irrigation system must be capable of delivering water to all plants using only the vehicle access allowed for in the Project Description. The Drilling Plan (Encroachment Permit, Attachment A) shows the required connection to the Keeler Community Services District well and the piping of the water to a trunk line at the south side of SR 136. A manifold of surface irrigation pipes supplied and pressurized from that trunk line, which will be painted with a landscape-compatible color as specified by BLM, is anticipated (Figure B1); however, other methods may be proposed within the confines of the Project Description and the Drilling Plan. Alternative pipe types, fittings, and hose connection specifications that will meet the performance criteria may be proposed. Any such alternatives must be fully described in the technical proposal. Continuous satisfactory operation of the irrigation system is the responsibility of the Contractor. Ramps over the surface irrigation pipelines may be utilized to protect the pipe during bale and plant delivery, and during irrigation events.

### **2. Straw bale size and type:**

Straw bales will be supplied by the District, and will be of the approximate dimension of 23 x 15 x 48". The cost of transportation and delivery of the straw bales to the project site will be paid by the District. The Contractor is responsible for scheduling the delivery of the bales. Straw bales will be available starting in August 2014.

### **3. Straw bale placement:**

Contractor will be supplied with a GPS data set that specifies the position of each straw bale for the project, and its proper orientation on the ground. It will be the Contractor's responsibility to locate each position on the ground and assure that the bales are placed correctly. A photo of the Test Project showing bale placement is in Figure B2. Work will be subject to periodic inspections by a District's representative; corrective action must be taken as necessary regarding correct placement. Position error of up to 3 feet will be allowable; orientation error of up to 15 degrees will be allowable.

### **4. Water access tube installation:**

A water access tube will be installed at each bale to provide water to the plants in the rooting zone instead of only at the surface. The tube must be at least 4 inches in diameter, and 12 inches deep, extending above the soil surface at least 3 inches (Figure B3). Perforations should be in the tube to allow for water egress throughout its length. However, the perforations should not be large enough to allow significant filling of the tube with sand over the course of the project. The tube must be capped at both the top and the bottom. Suggested material is perforated tile drain, but the contractor may use other material of suitable diameter, depth and porosity. The watering tubes will be removed by the contractor at the completion of the project. The watering tube will be installed such that three plants can be installed near it in a triangle configuration as shown in Figure B3.



## 5. Pre-irrigation

Prior to planting, approximately 5 gallons of water will be applied under each straw bale. This can be done at the time of bale placement, or at the time of planting, at the discretion of the contractor.

## 6. Plant condition and transport:

Plant condition will be evaluated and documented by the District's representatives prior to leaving the nursery. The Contractor is responsible for the cost and scheduling of transportation and delivery of the plants from the nursery to the project site. Plants must be in the same condition when the contractor installs them at the planting sites at the bales. Contractor may make provision for plant storage and maintenance at the staging areas. Any costs associated with such storage and maintenance should be included in the mobilization costs. Plant condition may not be permitted to deteriorate.

## 7. Planting:

Plants must be installed according to the following specifications: (Figure B3)

- Excavate a hole 12 inches deep and twice the diameter of the plant container
- Backfill the hole with just enough material so that the soil in the plant container will be at or very slightly (less than ½ inch) below the ground surface
- Carefully remove the plant from its container, holding the root ball in one hand to keep it intact
- Insert the plant into the hole. Holding it erect, backfill with the excavated material tamping it gently around the plant's root ball
- Immediately after planting, the plants will also be watered with approximately 3 gallons of water per bale. This water should be applied through the irrigation access tube, with any remaining water distributed in the shallow basins around each plant.

## 8. Plant cage installation:

All planting locations that include either greasewood (*Sarcobatus vermiculatus*) and/or inkweed (*Sueda moquinii*) must have a protective cage installed. The cage is installed as shown in the photo in Figure B4.

The cages are to be constructed of wire mesh with a diameter of opening that is not less than ½ inch. The installed cage must be 12 inches high, and large enough to intersect and secure to the bale on both ends, making a structure that is 3 sides of a square, with the bale forming the 4<sup>th</sup> side. A wire length of 48 inches should be sufficient. The wire cage should be installed such that the bottom 1-2 inches is buried below the ground level. The wire protective cages are to be removed when plants are of sufficient size such that they are out growing the enclosure or upon completion of the project.

## **9. Irrigation Amount and Schedule:**

Water will be applied to the plants at specified intervals after planting. Approximately 3 gallons of water will be applied at each bale during each irrigation event, using the water access tubes. The irrigation schedule is as follows (8 irrigation events):

- 1) Summer-Fall 2014 (time of bale distribution); to be conducted just prior to planting, 5 gallons per bale.
- 2) Fall/Winter 2014-2015 (time of planting); 3 gallons per bale
- 3-8) April/May and September/October of 2015, 2016, and 2017. Three gallons per bale per event. Total of 6 supplemental irrigation events.

The minimum amount of water, plus or minus 10 percent, specified in the Project Description must be delivered to the plant sites during each irrigation event using the irrigation system specified and installed or implemented by the contractor. Water use will be documented by meter. For each day of irrigation, the total number of bales irrigated will be documented, and the total number of gallons used will also be documented, with any other water uses such as to water stored plants, will be reported to the District.

## **10. Performance criteria**

The following performance standards will be monitored by the District during the course of the project:

- Bale placement. Position error of up to 3 horizontal feet from the specified position in the GIS database will be allowable. Bales will be oriented in a preferred direction with an orientation error of up to 15 degrees allowed.
- Irrigation system: The irrigation system must be maintained in serviceable condition for the life of the project. Any repairs or component replacements will be at the cost of the Contractor. Placement of ramps to shield pipe from ATVs is acceptable.
- Plant material. Plants will be inspected upon delivery from the nursery by District staff or consultants and condition will be noted. Plants must be maintained in the condition they were at delivery prior to being planted. Condition at the time of planting will be evaluated by District staff or consultants.
- Planting: District staff or consultants will monitor plant installation methods and will require corrective action if plants or cages are not installed according to specifications
- Irrigation: approximately 5 gallons of water are to be applied at each bale location prior to planting, and approximately 3 gallons are to be applied at each planting location at the time of plant installation and during each supplemental irrigation event. The amount of water delivered will be confirmed by daily reporting to the District of the number of sites irrigated and of the water meter reading for those daily deliveries. Failure to deliver sufficient water to the sites (plus or minus 10 percent from the target number of gallons) will require immediate corrective action.

## 11. Reporting

A brief report will be submitted monthly to the District with the invoice. The report will detail progress on the project, with specific reference to bale placement progress, planting progress, and irrigation details.

## 12. Other Considerations

- Where the GIS database indicates that a bale should be placed where a shrub is already present, no bale or plant placement will be necessary.
- The allowable difference in placement from the GIS point to the actual bale placement may be up to 3 horizontal feet.
- The allowable difference in orientation of the bale from the specified orientation may be up to 15 degrees.
- In areas that are devoid of sand at the time of the work, no bale placement will be necessary. Recent aerial photos or satellite imagery will be provided at the time of the bid walk that shows an estimate of the number of acres within the project footprint that include this condition. This condition would reduce the number of bales and plants that would need to be used by approximately 660 bales and 2,000 plants per acre.
- It is possible that the 85% control area will not be implemented at this time. However, your bid should assume that the entire project will be implemented and should show costs accordingly.
- A cultural monitor will be required during work in certain culturally sensitive areas. These areas will be described at the time of the bid walk.

# KEELER DUNES DUST MITIGATION PROJECT

## IRRIGATION SYSTEM DESIGN

### KEELER, CA



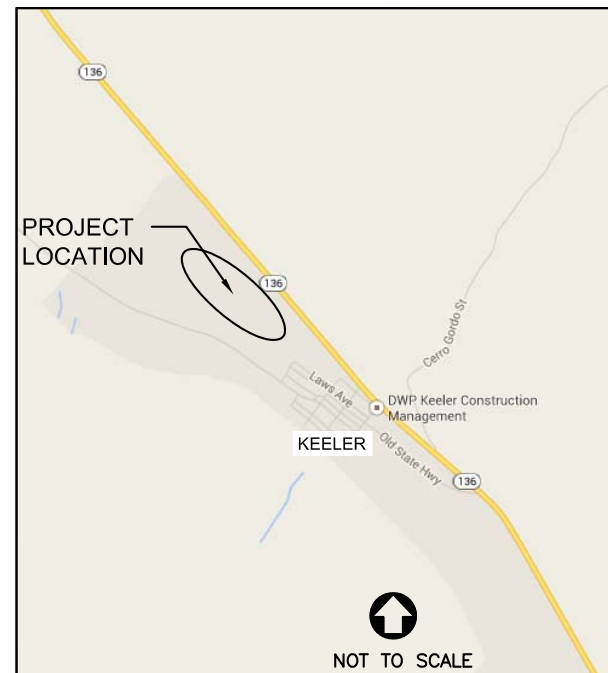
**CLIENT**  
 GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT  
 157 SHORT STREET  
 BISHOP, CA 93514  
 760.872.8211



**ENGINEER**  
 AMEC ENVIRONMENT & INFRASTRUCTURE, INC.  
 961 MATLEY LANE, SUITE 110  
 RENO, NEVADA 89502  
 775.329.6123

**SHEET INDEX**

SHEET	DRAWING NO.	DESCRIPTION
1	C0	TITLE SHEET
2	C1	PLAN VIEW – IRRIGATION SYSTEM LAYOUT
3	C2	PLAN VIEW – IRRIGATION SYSTEM LAYOUT
4	C3	PLAN AND PROFILE – CALIFORNIA 136 CROSSING
5	C4	WELL SITE PLAN
6	C5	PUMP STATION
7	C6	DETAILS
8	C7	DETAILS



4/30/14



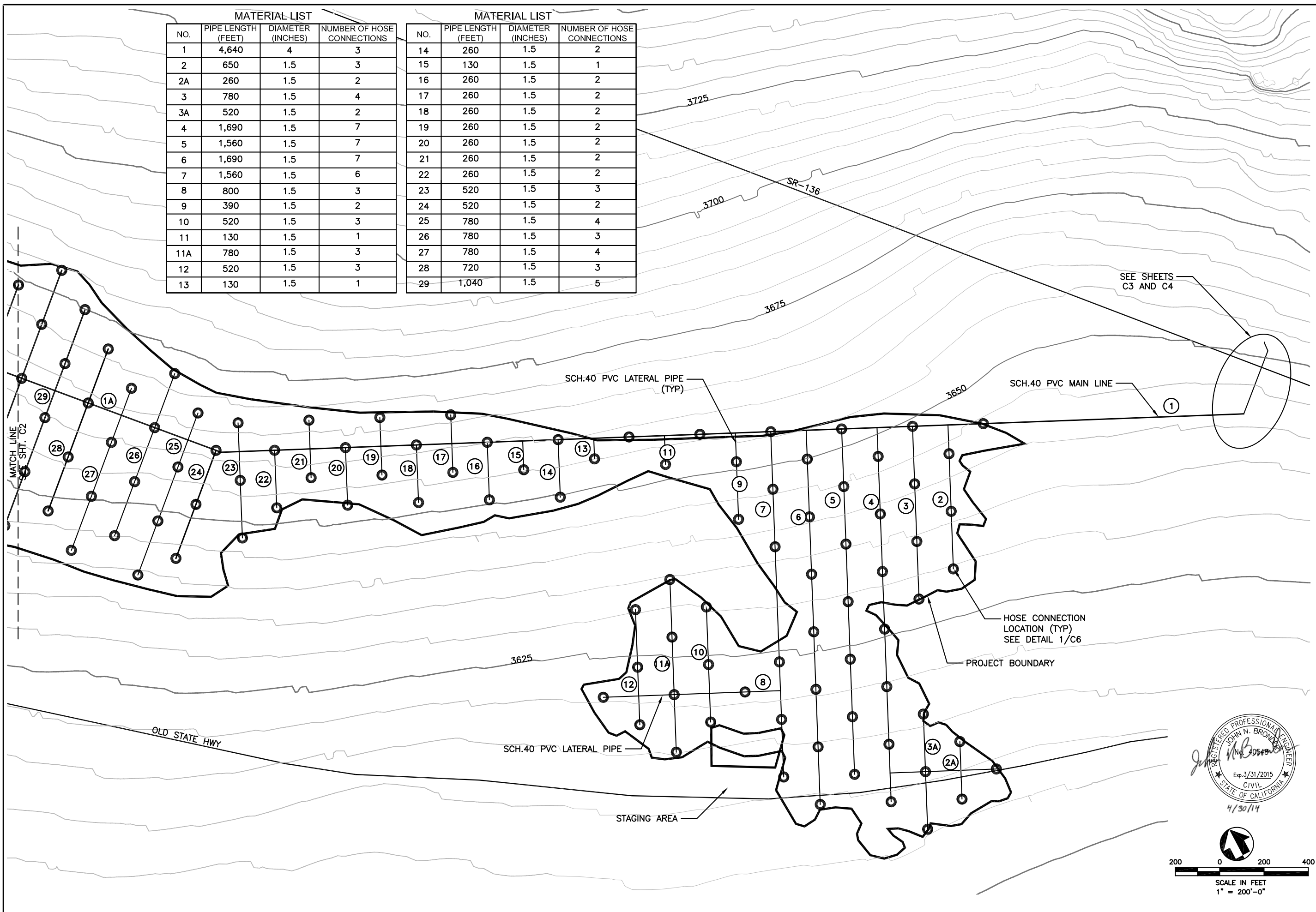
GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT  
 157 SHORT STREET, BISHOP, CA  
**TITLE SHEET**  
 KEELER DUNES DUST MITIGATION PROJECT  
 IRRIGATION SYSTEM DESIGN  
 CALIFORNIA

BID SET	DATE	APPROVED	BISHOP

4/30/2014 5:24 PM SHAKER,GORLA P:\ENGINEERING\INTER\_OFFICE\_PROJECTS\KEELER\_DUNES\600-DRAFTING\_DESIGN\CAD\DRAWINGS\C0.DWG

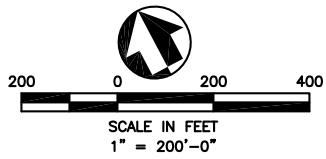
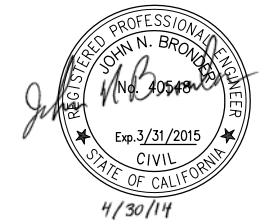
MATERIAL LIST			
NO.	PIPE LENGTH (FEET)	DIAMETER (INCHES)	NUMBER OF HOSE CONNECTIONS
1	4,640	4	3
2	650	1.5	3
2A	260	1.5	2
3	780	1.5	4
3A	520	1.5	2
4	1,690	1.5	7
5	1,560	1.5	7
6	1,690	1.5	7
7	1,560	1.5	6
8	800	1.5	3
9	390	1.5	2
10	520	1.5	3
11	130	1.5	1
11A	780	1.5	3
12	520	1.5	3
13	130	1.5	1

MATERIAL LIST			
NO.	PIPE LENGTH (FEET)	DIAMETER (INCHES)	NUMBER OF HOSE CONNECTIONS
14	260	1.5	2
15	130	1.5	1
16	260	1.5	2
17	260	1.5	2
18	260	1.5	2
19	260	1.5	2
20	260	1.5	2
21	260	1.5	2
22	260	1.5	2
23	520	1.5	3
24	520	1.5	2
25	780	1.5	4
26	780	1.5	3
27	780	1.5	4
28	720	1.5	3
29	1,040	1.5	5



SEE SHEETS C3 AND C4

MATCH LINE  
SHT. C2



GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT  
157 SHORT STREET, BISHOP, CA

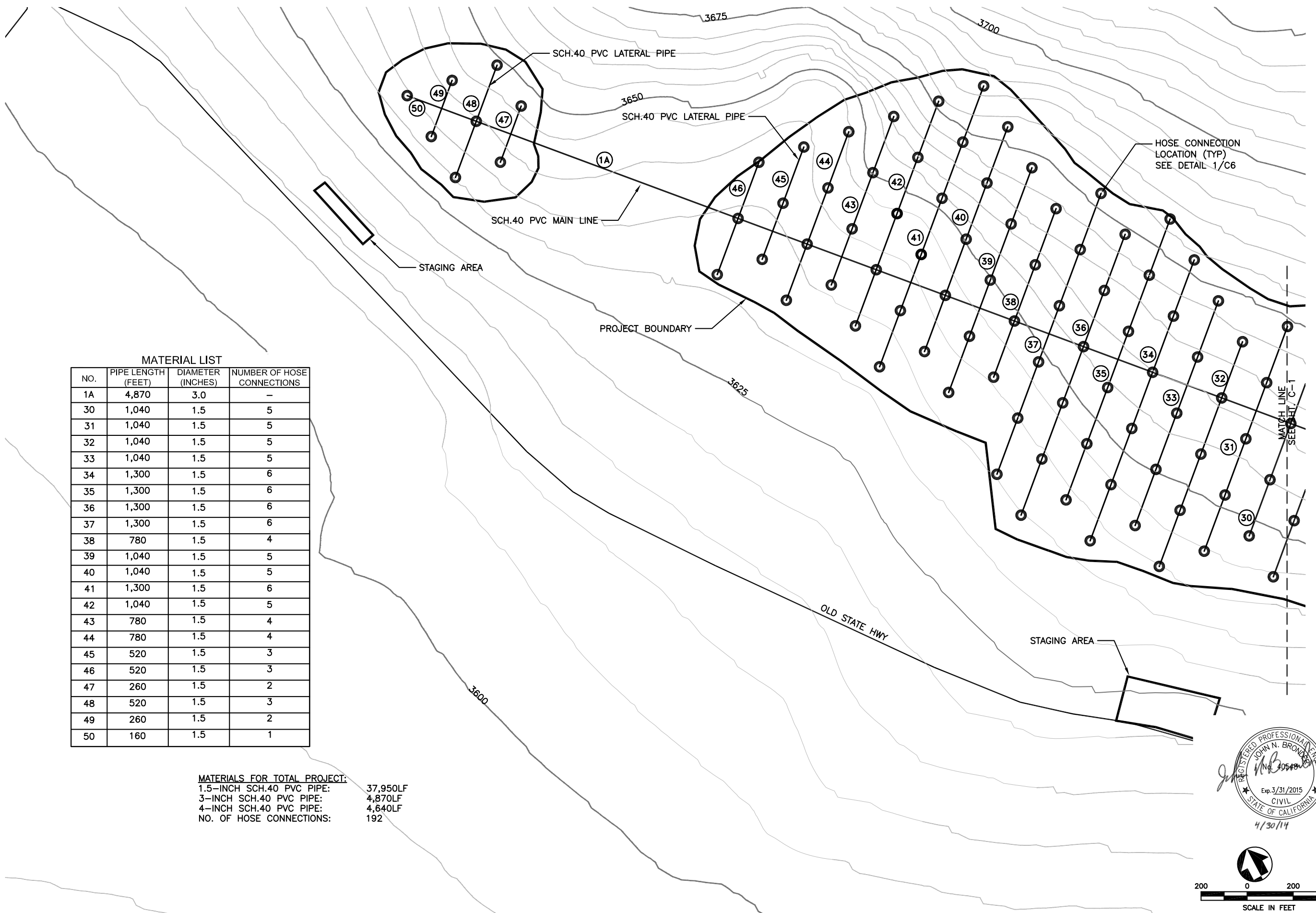
**PLAN VIEW**  
IRRIGATION SYSTEM LAYOUT  
KEELER DUNES DUST MITIGATION PROJECT  
IRRIGATION SYSTEM DESIGN

CALIFORNIA

BID SET	DATE	APPROVED	DESCRIPTION	MARK
4/30/14				

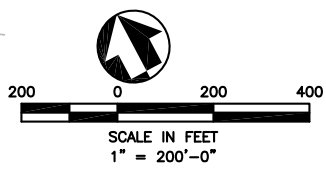
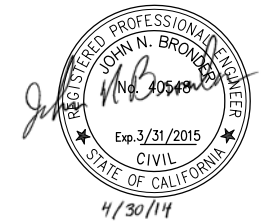
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DESIGN OFFICE: RENO, NV  
DESIGNED BY: JNB  
DRAWN BY: NRG  
CHK'D BY:  
APPROVED BY:  
DATE:

**C1**  
SHEET 2 OF 8



MATERIAL LIST			
NO.	PIPE LENGTH (FEET)	DIAMETER (INCHES)	NUMBER OF HOSE CONNECTIONS
1A	4,870	3.0	—
30	1,040	1.5	5
31	1,040	1.5	5
32	1,040	1.5	5
33	1,040	1.5	5
34	1,300	1.5	6
35	1,300	1.5	6
36	1,300	1.5	6
37	1,300	1.5	6
38	780	1.5	4
39	1,040	1.5	5
40	1,040	1.5	5
41	1,300	1.5	6
42	1,040	1.5	5
43	780	1.5	4
44	780	1.5	4
45	520	1.5	3
46	520	1.5	3
47	260	1.5	2
48	520	1.5	3
49	260	1.5	2
50	160	1.5	1

**MATERIALS FOR TOTAL PROJECT:**  
 1.5-INCH SCH.40 PVC PIPE: 37,950LF  
 3-INCH SCH.40 PVC PIPE: 4,870LF  
 4-INCH SCH.40 PVC PIPE: 4,640LF  
 NO. OF HOSE CONNECTIONS: 192



GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT  
 167 SHORT STREET, BISHOP, CA  
**PLAN VIEW**  
**IRRIGATION SYSTEM LAYOUT**  
 KEELER DUNES DUST MITIGATION PROJECT  
 IRRIGATION SYSTEM DESIGN

BID SET	DATE	APPROVED	DESCRIPTION	MARK
4/30/14				

PROJECT NO: 135540568  
 DESIGN OFFICE: RENO, NV  
 DESIGNED BY: JNB  
 DRAWN BY: NRG  
 CHK'D BY:  
 APPROVED BY:  
 DATE:



AMEC Environment & Infrastructure, Inc.  
961 Malley Lane, Suite 110  
Reno, Nevada, USA 89502

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT  
167 SHORT STREET, BISHOP, CA

**PLAN AND PROFILE**  
**CALIFORNIA HWY 136 CROSSING**  
KEELER DUNES DUST MITIGATION PROJECT  
IRRIGATION SYSTEM DESIGN

CALIFORNIA

BISHOP

BID SET	DATE	APPROVED	DESCRIPTION	MARK
	4/30/14			

PROJECT NO: 1355-005688

DESIGN OFFICE: RENO, NV

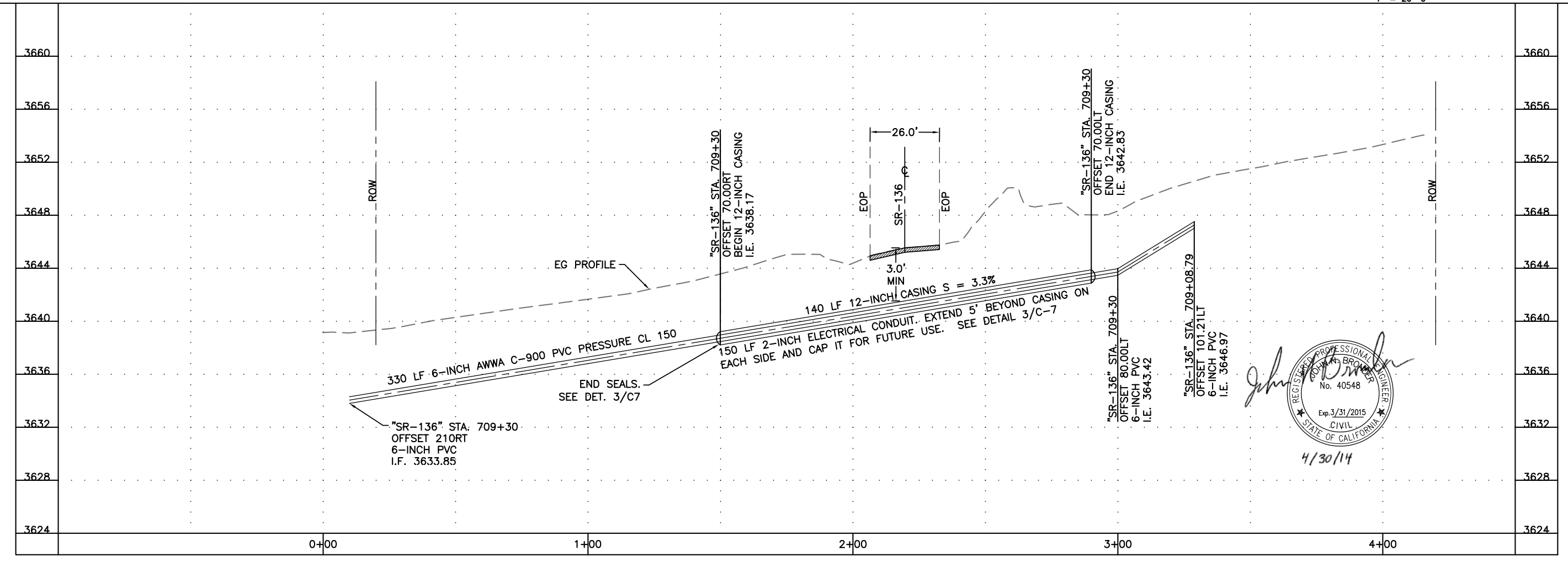
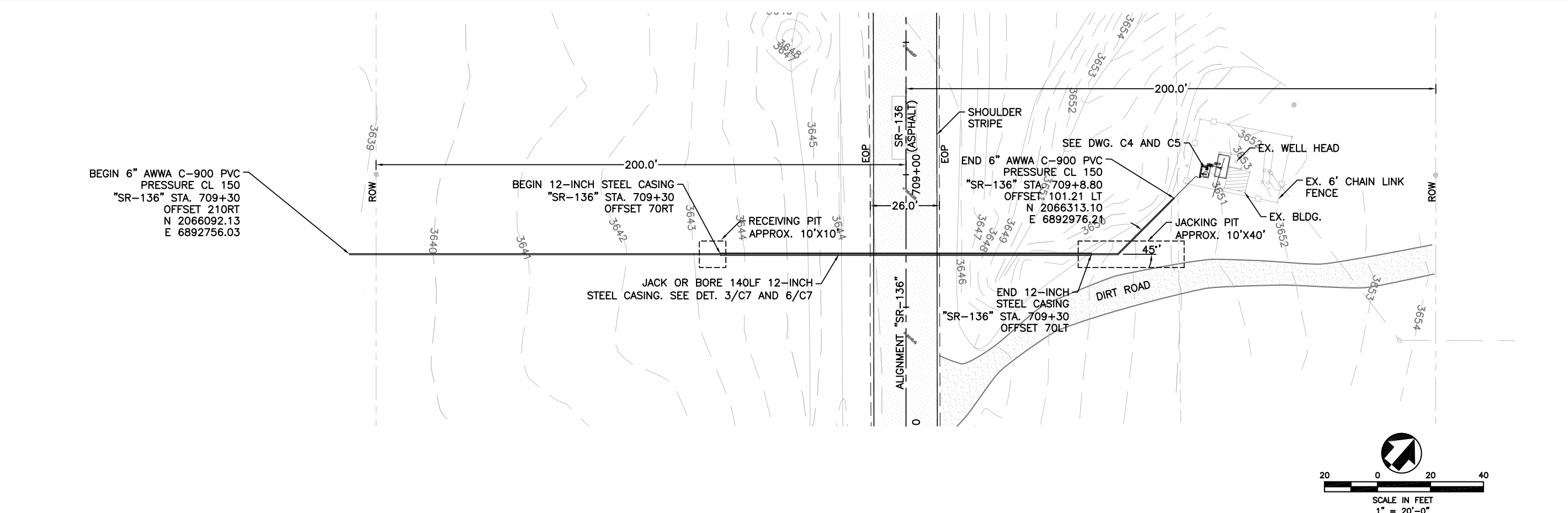
DESIGNED BY: JNB

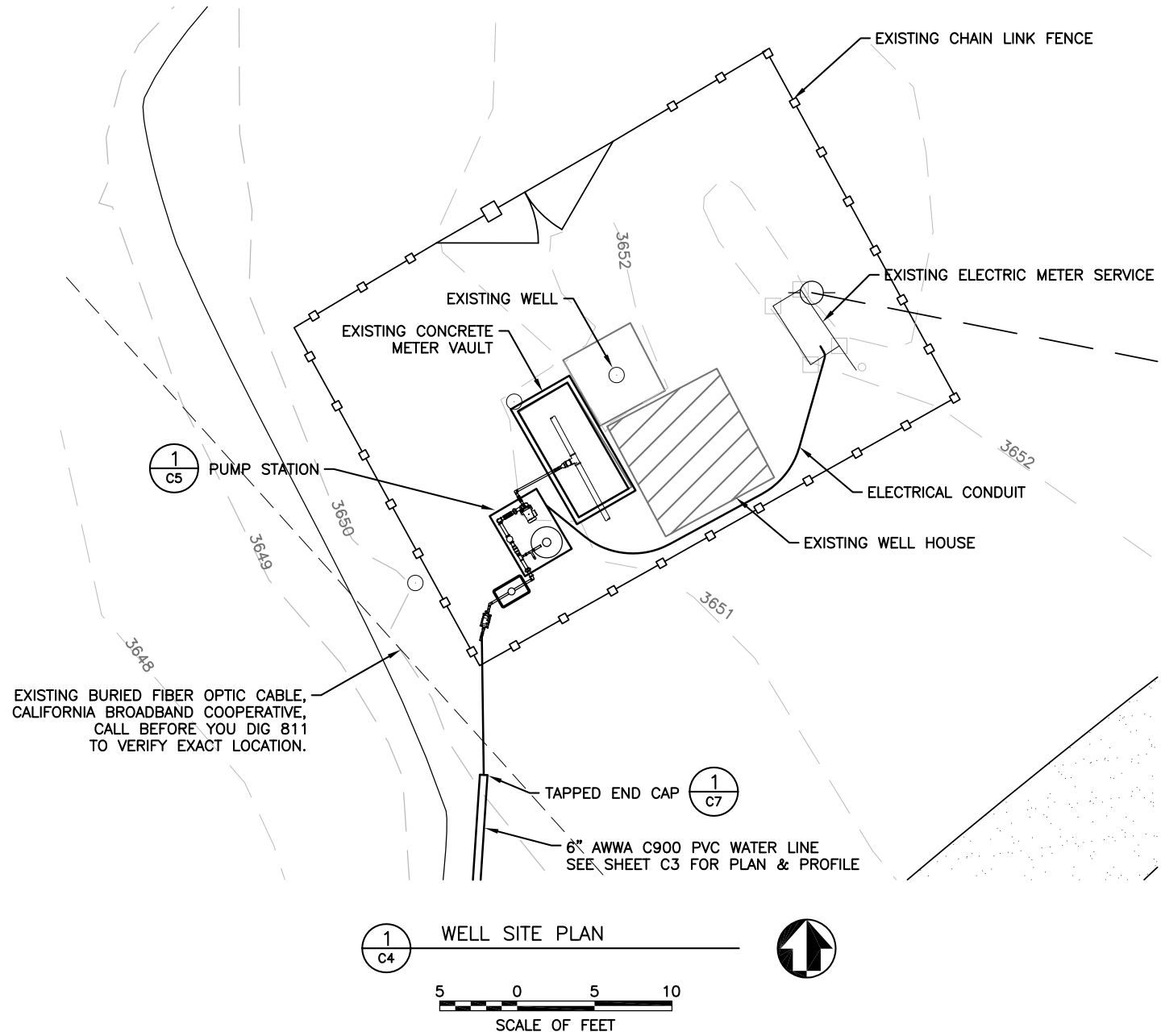
DRAWN BY: NRG

CHK'D BY:

APPROVED BY:

DATE:





**ELECTRICAL NOTES**

1. ALL ELECTRICAL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 70, NATIONAL ELECTRICAL CODE (N.E.C.) (LATEST EDITION), NFPA 101 CODE FOR SAFETY TO LIFE FROM FIRE IN BUILDING AND STRUCTURES (LATEST EDITION), UNIFIED FACILITY CRITERIA, LOCAL UTILITY COMPANY REQUIREMENTS, AMERICANS WITH DISABILITIES ACT (ADA), AND THE CONTRACT SPECIFICATIONS.
2. THE CONTRACTOR SHALL BECOME FAMILIAR WITH ALL DETAILS OF THE WORK AND VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION SO THAT THE EQUIPMENT WILL BE PROPERLY LOCATED AND READILY ACCESSIBLE.
4. VERIFY AND MEASURE SYSTEM VOLTAGE PRIOR TO START OF WORK. NOTIFY ENGINEER IF SYSTEM VOLTAGE IS NOT WITHIN +/-2% OF SYSTEM RATED VOLTAGE. VERIFY SYSTEM GROUND IN ACCORDANCE WITH NFPA 70 ARTICLE 250 AND GROUND RESISTANCE MEASURES LESS THAN 15 OHMS. MAKE MODIFICATIONS TO GROUND SYSTEM IF NOT IN COMPLIANCE WITH NFPA AND/OR DOES NOT MEASURE LESS THAN 15 OHMS.
5. WIRING SHALL CONSIST OF INSULATED CONDUCTORS INSTALLED IN CONDUIT WITH A GREEN INSULATED GROUND WIRE FOR THE GROUNDING CONDUCTOR SIZED PER NFPA 70 WITH APPROPRIATE DERATING FACTORS. HOMERUNS SHALL NOT EXCEED THREE PHASE OR THREE SINGLE PHASE CIRCUITS. ISOLATED GROUNDS SHALL INCLUDE GREEN WITH YELLOW STRIPE ISOLATED GROUND CONDUCTOR AND AN EQUIPMENT SAFETY GROUND CONDUCTOR. BRANCH CIRCUIT VOLTAGE DROP SHALL NOT EXCEED ASHRAE 90.1 RECOMMENDATIONS. ENSURE CONDUCTORS ARE APPROPRIATELY DERATED FOR AMBIENT TEMPERATURE CONDITIONS.
6. PROVIDE COMPLETE PUMP CIRCUIT WITH WATER PRESSURE SENSOR CONTROL LOCATED ON DISCHARGE SIDE OF PRESSURE TANK. USE WATER PRESSURE CONTACTOR TO CONTROL COMBINATION MOTOR CONTROLLER SERVICE DISCONNECT. USE LINE VOLTAGE AS CONTROL CIRCUIT VOLTAGE. ROUTE CIRCUIT UNDERGROUND FROM EXISTING PANELBOARD AND STUB UP ADJACENT TO PUMP. PROVIDE PRESSURE GAUGE ADJACENT TO WATER PRESSURE CONTACTOR FOR READILY VERIFYING PRESSURE SETTINGS OF CONTACTOR.
7. PRESSURE SWITCH SHALL BE HEAVY DUTY, DIAPHRAGM TYPE, WITH DIFFERENTIAL PRESSURE RANGE OF 15-30 PSIG AND CUTOUT OF 20-80 PSI, ADJUSTABLE. PROVIDE WEATHERPROOF ENCLOSURE.
8. MOTOR CONTROLLER STARTER DISCONNECT SHALL BE FULL VOLTAGE, ACROSS THE LINE, NON-REVERSING, FUSED TYPE WITH OVERLOAD PROTECTION. SIZE FOR VOLTAGE AND HORSEPOWER OF MOTOR. STARTER SHALL BE ENCLOSED IN A NEMA 3R ENCLOSURE WITH EXTERIOR DISCONNECT HANDLE ADJACENT TO PUMP IN ACCORDANCE WITH NFPA 70, ARTICLE 430.
9. UNDERGROUND CONDUIT SHALL BE SCHEDULE 40 PVC. ABOVE GROUND CONDUIT SHALL BE GALVANIZED RIGID STEEL. USE LIQUID-TIGHT FLEXIBLE METAL CONDUIT BETWEEN METAL CONDUIT AND PUMP MOTOR AND CONTROL DEVICES. BURY CONDUITS DIRECT AT A MINIMUM OF 24" BELOW GRADE. PROVIDE 3" WIDE, RED COLORED, BURIED METALLIC WARNING TAPE, LABELED "CAUTION BURIED ELECTRIC LINE BELOW."

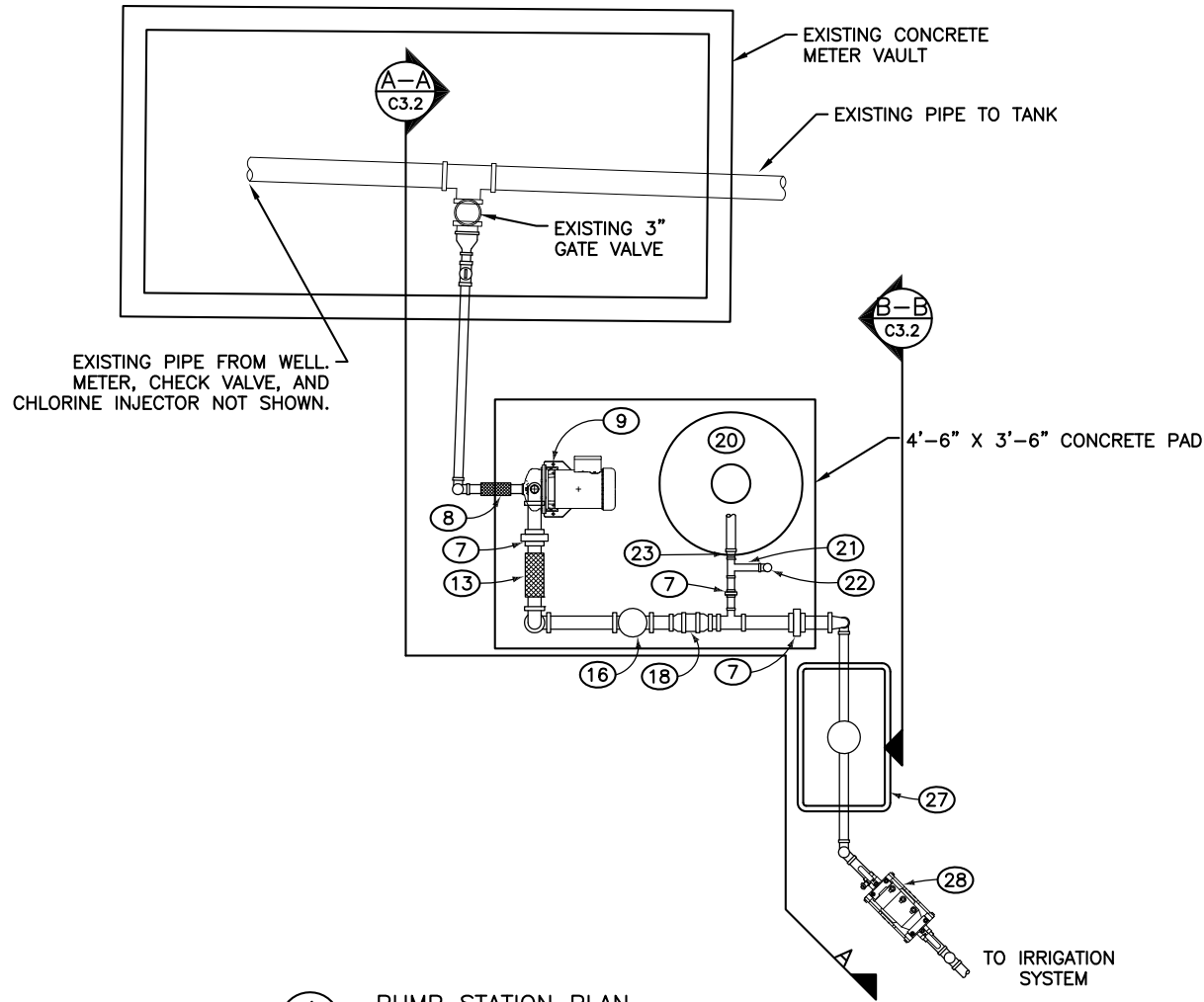
*John A. [Signature]*  
 REGISTERED PROFESSIONAL ENGINEER  
 No. 40548  
 Exp. 3/31/2015  
 CIVIL  
 STATE OF CALIFORNIA  
 4/30/14



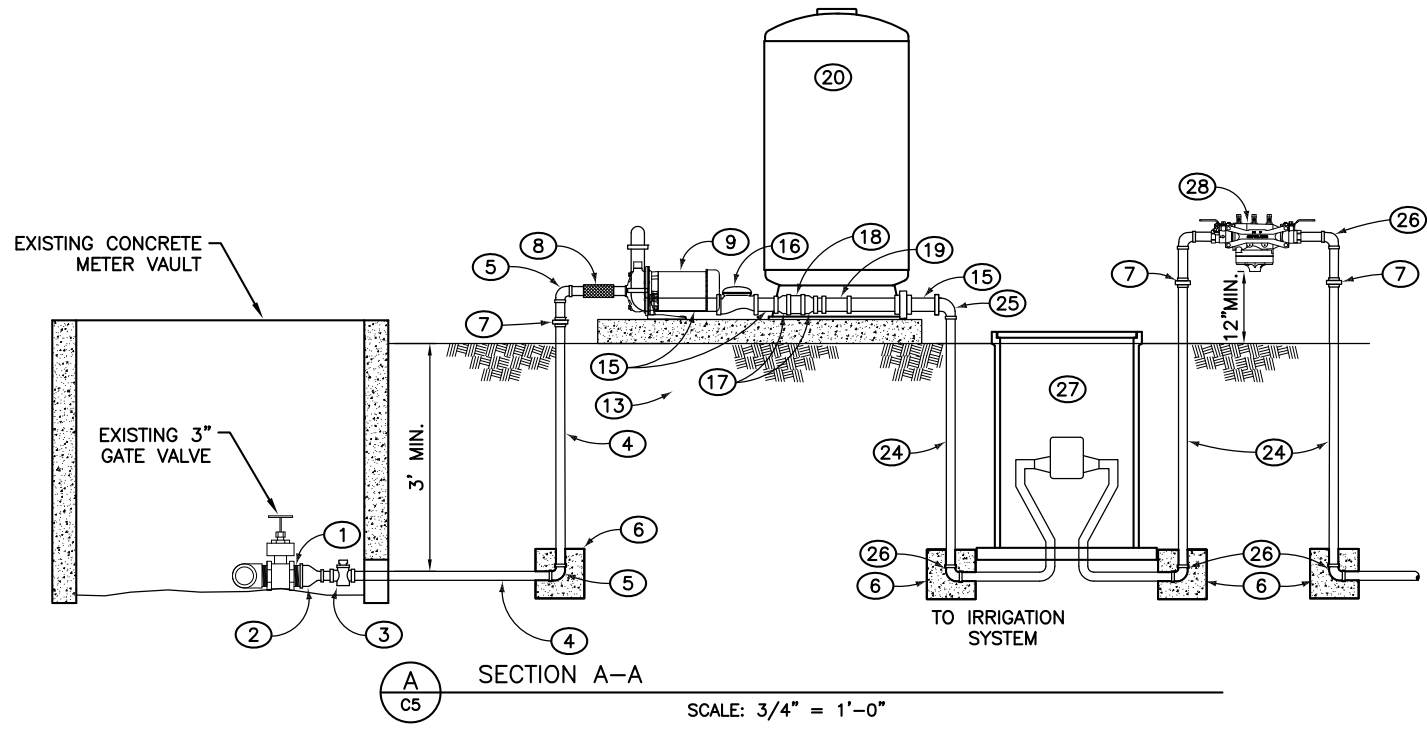
GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT  
 157 SHORT STREET, BISHOP, CA  
**WELL SITE PLAN**  
 KEELER DUNES DUST MITIGATION PROJECT  
 IRRIGATION SYSTEM DESIGN  
 CALIFORNIA

BID SET	DATE	APPROVED	DESCRIPTION	MARK
4/30/14				

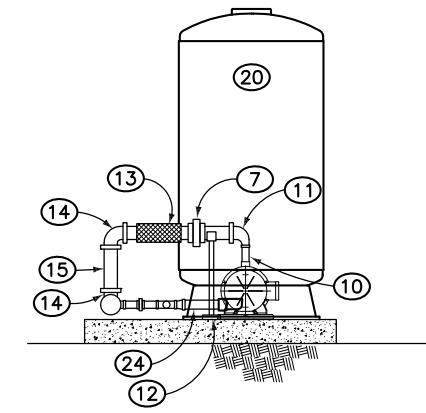




1 PUMP STATION PLAN  
SCALE: 3/4" = 1'-0"



A SECTION A-A  
SCALE: 3/4" = 1'-0"



B SECTION B-B  
SCALE: 3/4" = 1'-0"

KEY NOTES

- 1 3" THREADED NIPPLE
- 2 3"X 1-1/2" THREADED REDUCING COUPLING
- 3 1-1/2" THREADED STOP WASTE VALVE, MUELLER H-10284N OR APPROVED EQUAL.
- 4 1-1/2" THREADED PIPE, LENGTH AS REQUIRED.
- 5 1-1/2" THREADED 90° ELBOW.
- 6 CONCRETE ENCASEMENT
- 7 UNION, MATCH PIPE SIZE
- 8 1-1/2"X 9" LG. BRAIDED FLEXIBLE CONNECTOR, FLEXICRAFT MODEL TT, UNISOURCE MFG. MODEL SF-21MMT, OR APPROVED EQUAL.
- 9 5 HP, 3 PHASE, 3600 RPM CENTRIFUGAL PUMP. EBARA MODEL 2CDXU OR APPROVED EQUAL.
- 10 1" THREADED NIPPLE, LENGTH AS REQUIRED
- 11 2"X 1" THREADED REDUCING 90° ELBOW
- 12 PIPE SUPPORT, 2" ANVIL FIG. 62, TYPE C OR APPROVED EQUAL. SET BASE PLATE ON CONCRETE PAD.
- 13 2"X 10" LG. BRAIDED FLEXIBLE CONNECTOR, FLEXICRAFT MODEL TT, UNISOURCE MFG. MODEL SF-21MMT, OR APPROVED EQUAL.
- 14 2" THREADED 90° ELBOW
- 15 2" THREADED PIPE, LENGTH AS REQUIRED
- 16 2" CYCLE STOP VALVE MODEL CSV3B WITH THREADED ENDS.
- 17 2-1/2"X 2" REDUCER COUPLING
- 18 2-1/2" FLOW CONTROL VALVE RATED TO 50 GPM, AMERICAN GRANBY DOLE GH50 2 1/2M X 2 1/2M 50GPM, OR APPROVED EQUAL.
- 19 2"X 1" THREADED TEE
- 20 85 GALLON PRESSURE TANK, PRO-SOURCE PLUS MODEL PSP85-T52, OR APPROVED EQUAL.
- 21 1" TANK TEE WITH PRESSURE SWITCH, 100 PSI PRESSURE GAUGE, AND 1/2" BOILER DRAIN. AMERICAN GRANBY MODEL TP100GF, OR APPROVED EQUAL.
- 22 1" PRESSURE RELIEF VALVE
- 23 1-1/4"X 1" THREADED COUPLING
- 24 1-1/4" THREADED PIPE, LENGTH AS REQUIRED.
- 25 2"X 1-1/4" THREADED REDUCING 90° ELBOW
- 26 1-1/4" THREADED 90° ELBOW
- 27 1" METER, SEE DETAIL 5/C7.
- 28 1-1/4" REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTER, ZURN WILKINS MODEL 375XLB OR APPROVED EQUAL.

- NOTES:
1. ALL ELBOWS AND FITTINGS SHALL BE NPT THREADED STEEL.
  2. BACKFLOW DEVICE TO BE REDUCED PRESSURE PRINCIPLE (SIZE AS INDICATED ON PLANS). RESILIENT SEATED SHUTOFF VALVES REQUIRED.

*John N. Brudner*  
 REGISTERED PROFESSIONAL ENGINEER  
 JOHN N. BRUDNER  
 No. 40548  
 Exp. 3/31/2015  
 CIVIL  
 STATE OF CALIFORNIA  
 4/30/14

**amec**  
 AMEC Environment & Infrastructure, Inc.  
 961 Matley Lane, Suite 110  
 Reno, Nevada, USA 89502

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT  
 157 SHORT STREET, BISHOP, CA

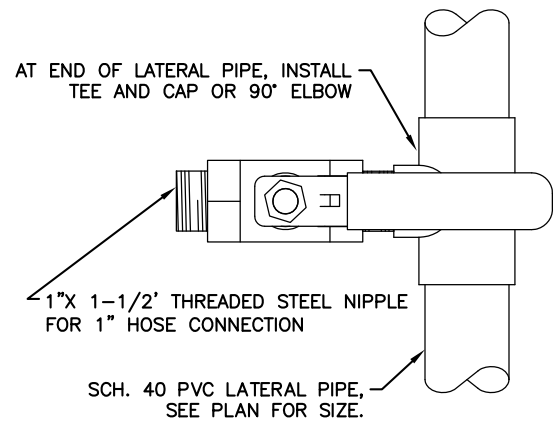
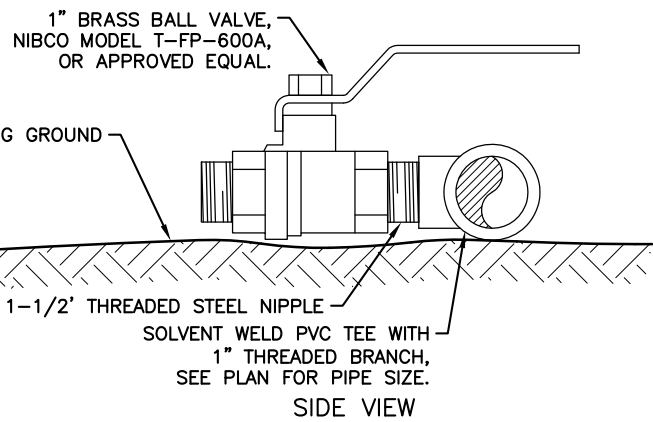
**PUMP STATION**

KEELER DUNES DUST MITIGATION PROJECT  
 IRRIGATION SYSTEM DESIGN

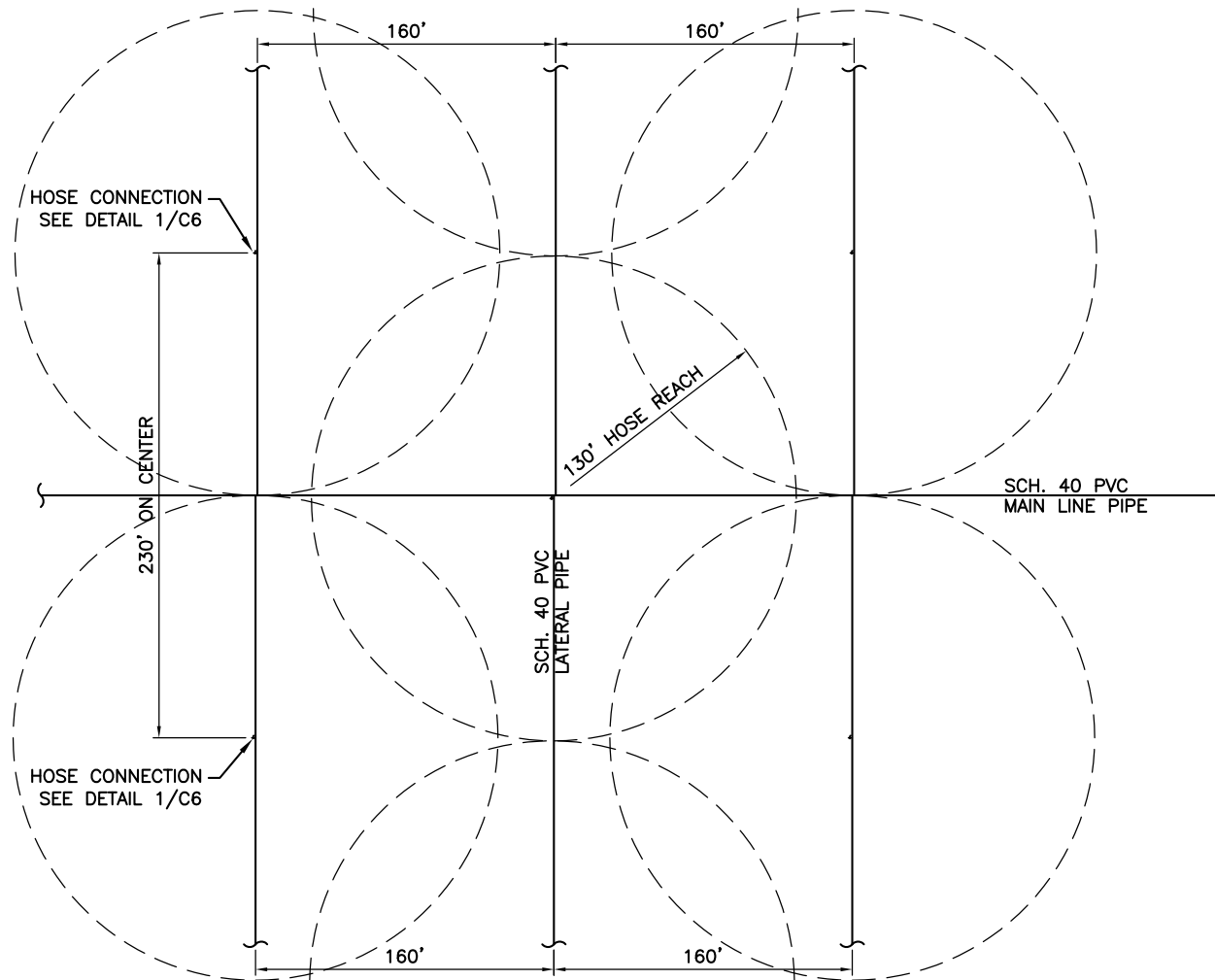
BID SET	DATE	APPROVED	DESCRIPTION	MARK
4/30/14				

PROJECT NO: 135540568  
 DESIGN OFFICE: RENO, NV  
 DESIGNED BY: JNB  
 DRAWN BY:  
 CHK'D BY:  
 APPROVED BY:  
 DATE:

**C5**  
 SHEET 6 OF 8



① HOSE CONNECTION VALVE  
C6 NOT TO SCALE



**NOTES:**

1. USE OFFSETTING TEES WHEN CROSSES OF THE APPROPRIATE SIZES ARE NOT AVAILABLE.
2. HOSE REACH IS BASED ON A 150-FOOT HOSE LENGTH WITH LOSS OF REACH OF 20- FEET FOR SNAKING AROUND STRAW BALES AND PLANTS.

③ LATERAL LAYOUT DETAIL  
C6 NOT TO SCALE

*John A. Brander*  
 REGISTERED PROFESSIONAL ENGINEER  
 No. 40548  
 Exp. 3/31/2015  
 CIVIL  
 STATE OF CALIFORNIA  
 4/30/14

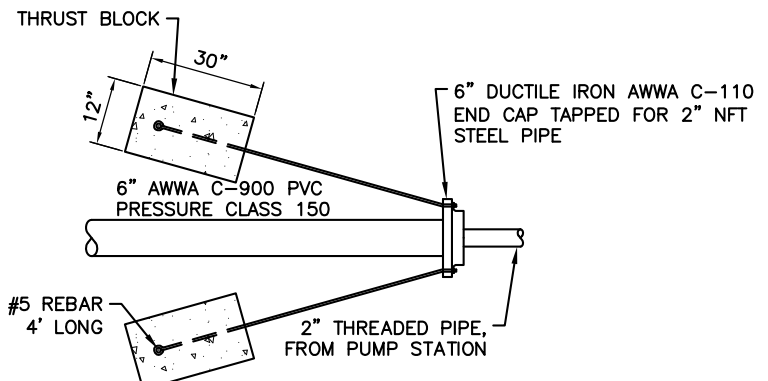
**DETAILS**

KEELER DUNES DUST MITIGATION PROJECT  
IRRIGATION SYSTEM DESIGN

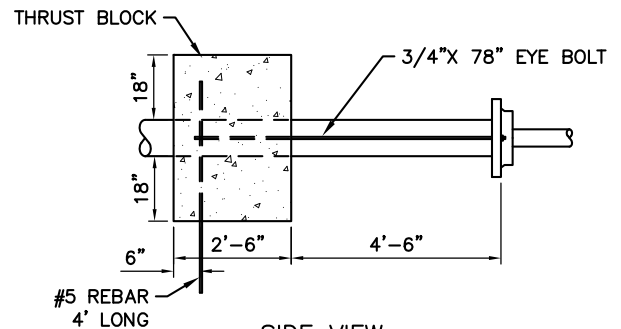
CALIFORNIA

BID SET	DATE	APPROVED	DESCRIPTION	MARK
4/30/14				

PROJECT NO: 135540568  
 DESIGN OFFICE: RENO, NV  
 DESIGNED BY: JNB  
 DRAWN BY:  
 CHK'D BY:  
 APPROVED BY:  
 DATE:

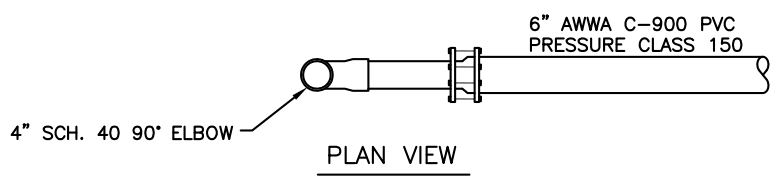


PLAN VIEW

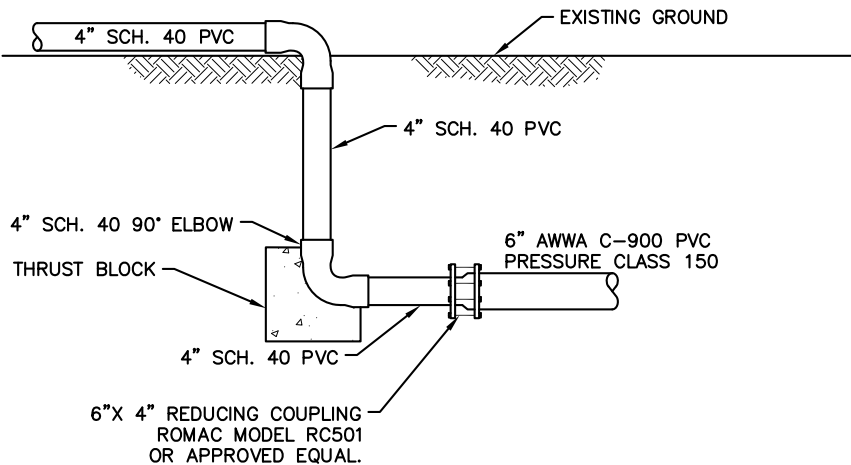


SIDE VIEW

1 TAPPED END CAP DETAIL  
C7 NOT TO SCALE



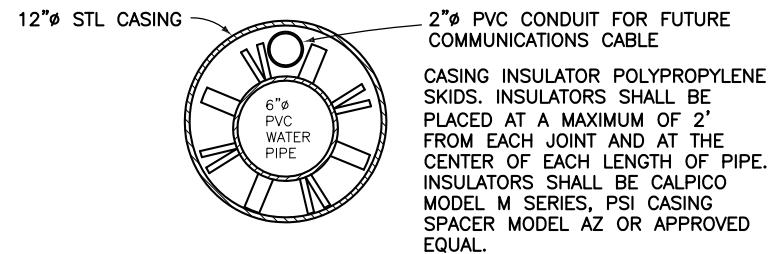
PLAN VIEW



SIDE VIEW

2 6" X 4" REDUCER DETAIL  
C7 NOT TO SCALE

INSTALL 12" X 6" NEOPRENE RUBBER END SEALS AT EACH END. TWO STAINLESS STEEL BANDS SHALL BE FURNISHED AT EACH END.

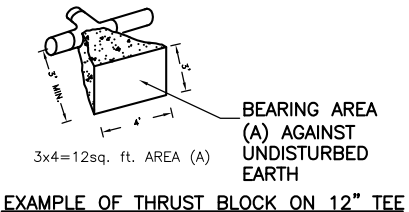


3 BORED OR JACKED STEEL CASING  
C7 NOT TO SCALE

TYPE OF FITTING	90° BEND	45° BEND	11.25° OR 22.5° BEND	TEE OR DEAD END	CROSS W/PLUG	TEE W/PLUG	ALL PLUGS (DEAD END)
TYPICAL INSTALLATION							

THRUST BLOCK BEARING AREA (SQ. FT.)

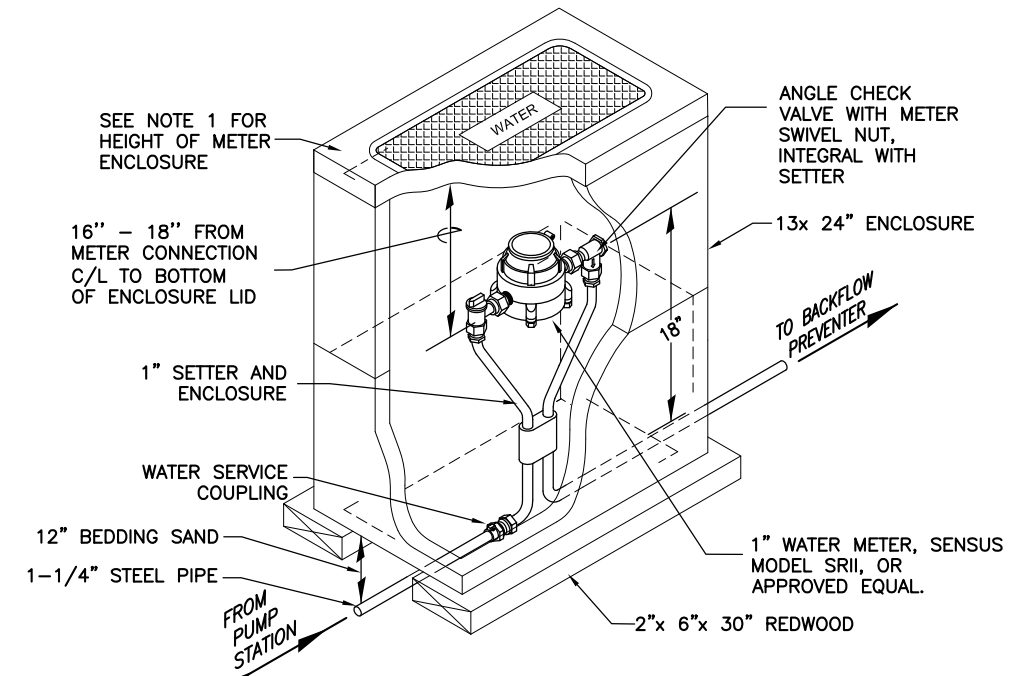
SIZE OF PIPE	90° BEND	45° BEND	11.25° OR 22.5° BEND	TEE OR DEAD END	TEE W/PLUG	CROSS W/PLUG
4"	2	1	1	2	2	2
6"	4	4	2	4	4	4
8"	7	4	2	5	7	7
10"	12	6	3	8	12	12
12"	16	10	5	12	16	16
14"	20	12	6	14	20	20
16"	27	15	8	18	27	27
18"	45	25	13	32	45	45
24"	65	35	18	48	65	65



- THRUST BLOCKS TO BE CONSTRUCTED OF 3000psi CONCRETE.
- BLOCKS TO BE POURED AGAINST UNDISTURBED SOIL.
- JOINTS, BOLTS AND FACE PLUGS TO BE KEPT CLEAR OF CONCRETE BY USE OF PLASTIC WRAP. SIDES SHALL BE WOOD FORMED UNLESS APPROVED BY ENGINEER.
- THE ABOVE THRUST BLOCK SIZES SHALL APPLY UNLESS LARGER THRUST BLOCKS ARE INDICATED.

4 THRUST BLOCKS  
C7 NOT TO SCALE

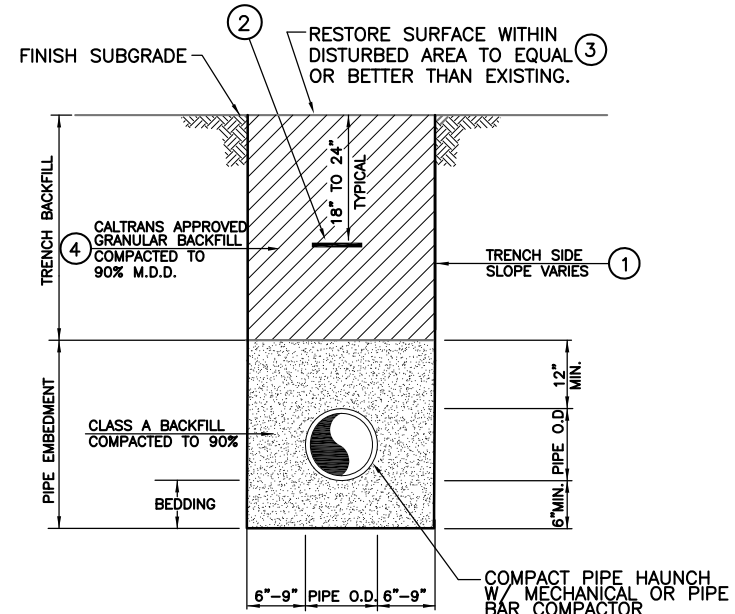
John A. Brown  
REGISTERED PROFESSIONAL ENGINEER  
No. 40548  
Exp. 3/31/2015  
CIVIL  
STATE OF CALIFORNIA  
4/30/14



NOTES:

- TOP OF METER ENCLOSURE SHALL BE SET 0.2 FEET ABOVE HIGHEST FINISHED GRADE SURROUNDING ENCLOSURE WITH LANDSCAPED AREAS
- ENCLOSURE TO BE BACKFILLED WITH WATER PIPE BEDDING SAND ONLY.
- BLANKET TO BE INSTALLED ABOVE METER AND BELOW TRANSMITTER.

5 WATER METER  
C7 NOT TO SCALE



NOTES:

- TRENCH SIDE SLOPE VARIES DEPENDING ON IN-SITU SOIL TYPES, SHORING AND SHEETING AND CONSTRUCTION METHODS. COMPLY WITH OSHA STANDARDS.
- PROVIDE BLUE WARNING TAPE MARKED "CAUTION: WATERLINE BELOW".
- RESTORE SURFACE WITHIN DISTURBED AREAS TO A CONDITION EQUAL OR BETTER THAN EXISTED PRIOR TO CONSTRUCTION, INCLUDING GRAVEL, OR REVEGETATION.
- PROVIDE GRANULAR BACKFILL PER SECTION 26 OF CALTRANS STANDARD SPECIFICATIONS.

6 TRENCH DETAIL  
C7 NOT TO SCALE

# Test Site Following Placement of First Bales



*May 23, 2013*

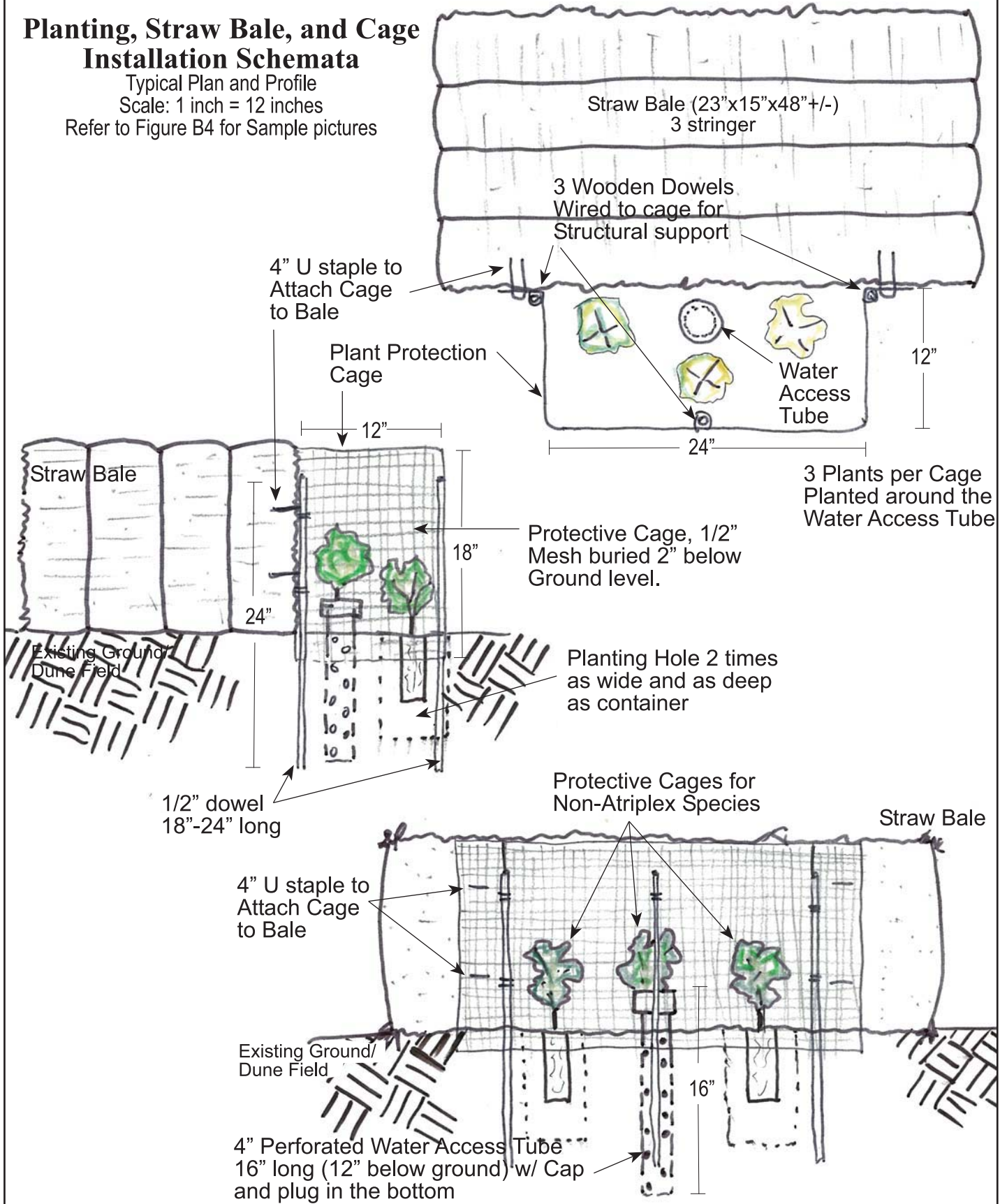
**Bale Placement in Pilot Project. Note Irregular Distribution, and Standard Orientation of Bales to the Prevailing Wind.**

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# Planting, Straw Bale, and Cage Installation Schemata

Typical Plan and Profile  
 Scale: 1 inch = 12 inches  
 Refer to Figure B4 for Sample pictures



Planting, Straw Bale, and Cage Schemata  
 Keeler Dunes Dust Mitigation Project  
 Great Basin Unified Air Pollution Control District

FIGURE  
**B3**

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**Cages as Installed Against Bale**



**Pre-constructed Cages**



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