2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan

Great Basin Unified Air Pollution Control District

January 28, 2008

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Great Basin Unified Air Pollution Control District

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NOTICE OF PUBLIC HEARING

ADOPTION AND APPROVAL OF THE PROPOSED FINAL 2008 REVISION TO THE OWENS VALLEY PM_{10} PLANNING AREA DEMONSTRATION OF ATTAINMENT STATE IMPLEMENTATION PLAN, INCORPORATED ORDER UNDER THE PROVISIONS OF CAL. HEALTH & SAFETY CODE 42316 AND FINAL SUBSEQUENT ENVIRONMENTAL IMPACT REPORT

PLEASE TAKE NOTICE that on Monday, January 28, 2008, the Governing Board of the Great Basin Unified Air Pollution Control District (GBUAPCD) will conduct a public hearing and consider for adoption a proposed final 2008 revision to the previously-adopted Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan (2008 SIP). The public hearing, and the Governing Board's consideration for adoption, will occur at the District Governing Board's regular meeting on **Monday, January 28, 2008 at 10:00 a.m. in the Inyo County Administrative Center, Board of Supervisors Chambers, 224 North Edwards Street (US Hwy 395), Independence, California 93526**. At the meeting, the District Governing Board will: 1) consider and approve the Final 2008 Subsequent Environmental Impact Report (2008 SEIR) that analyzes the environmental impacts of the proposed project; 2) consider and approve the 2008 SIP, and 3) consider and adopt an order authorized by California Health & Safety Code Sec. 42316 for the City of Los Angeles (City) to install, operate and maintain additional dust control measures on the Owens Lake bed. Other actions related to these actions may also be taken at the meeting. Members of the public will have an opportunity to submit written comments or make oral statements at the public hearing on both the 2008 SIP and 2008 SEIR.

The GBUAPCD prepared the 2008 SIP for the control of fine dust emissions (PM_{10}) in response to a finding by the United States Environmental Protection Agency (USEPA) that the Owens Valley Planning Area did not attain the 24-hour National Ambient Air Quality Standard (NAAQS) for PM_{10}.

On November 13, 2003, the GBUAPCD approved the 2003 Revised State Implementation Plan for the Owens Valley Planning Area (2003 SIP), which was later approved by the California Air Resources Board. The 2003 SIP is currently implemented under GBUAPCD Board Order #03111301, which primarily addresses the PM_{10} control requirements to reduce wind-blown PM_{10} emissions from the exposed playa at Owens Lake. The 2003 SIP control strategy ordered the City to control PM_{10} emissions from the dried bed of Owens Lake by using shallow flooding, managed vegetation, and/or gravel coverings on 29.8 square miles of the lake bed. The 2003 SIP was intended to demonstrate attainment with the PM_{10} NAAQS by December 31, 2006 by implementing control measures over the three years prior to that date. By December 31, 2006, the City met their deadline and had implemented dust control measures on all 29.8 square miles of the lake bed as required in the 2003 SIP.

In 2006, a dispute arose between the GBUAPCD and the City regarding requirements to control dust from additional areas at Owens Lake beyond the 29.8 square miles of emissive area identified in the 2003 SIP. On December 4, 2006 a Settlement Agreement was approved by both parties to resolve this dispute. Under the major provisions of this agreement, the City agreed to implement an additional 13.2 square miles of dust control measures on the lake bed (for a total of 43 square miles) by April 1, 2010 and the District agreed to revise the 2003 SIP before March 1, 2008 to incorporate the provisions of the Settlement Agreement.

The proposed project consists of additional dust control measures to be constructed on the dried bed of Owens Lake at the southern end of Owens Valley, in Inyo County, in eastern-central California. The primary goal of the proposed project is to continue to reduce dust emissions from the dry lake bed to attain the 24-hour NAAQS for PM_{10} by March, 2012. The 2008 SIP contains the project location, history, air quality setting, emission inventory, control measures, air quality modeling, control strategy, and enabling legislation.

A draft of the 2008 SIP and its incorporated order under the provisions of California Health and Safety Code Section 42316 were made available for public review and comment between September 16, 2007 and October 30, 2007. The GBUAPCD received, reviewed and responded to the comments. The draft 2008 SIP and order were then revised. The proposed final 2008 SIP and order will be available for public review after December 20, 2007 at the GBUAPCD's Bishop Office, 157 Short Street, Bishop, California, 93514, at the GBUAPCD web-site: www.gbuapcd.org, and at Inyo County Libraries in Independence, Big Pine, Bishop, Lone Pine, Death Valley and Tecopa, California. Copies of the 2008 SIP on CD are free of charge upon request and hardcopies will be available at reproduction cost ($35). Copies of the Final 2008 SEIR will be available after January 17, 2008. All copy requests can be made by calling Wendy Sugimura, GBUAPCD Board Clerk, at (760) 872-8211.

GBUAPCD staff encourages those who have comments on the 2008 SIP to attend the meeting on January 28, 2008 and submit written comments or make oral statements to the Governing Board prior to their approval of the Final 2008 SEIR and 2008 SIP.

January 28, 2008

2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan

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CHAPTER 1

Introduction

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Introduction

This 2008 State Implementation Plan (2008 SIP) has been prepared by the Great Basin Unified Air Pollution Control District (District) in response to a finding by the United States Environmental Protection Agency (USEPA) that the Owens Valley Planning Area did not attain the 24-hour National Ambient Air Quality Standard (NAAQS) for particulate matter of 10 microns or less (PM_{10}) by December 31, 2006, as mandated by the Clean Air Act Amendments of 1990 (CAAA) (USEPA, 2007a). This document includes an analysis of the particulate matter air pollution problem in the Owens Valley and provides a revised control strategy to bring the area into attainment with the federal air quality standard for particulate matter, as soon as practicable by achieving at least a 5 percent reduction in PM_{10} emissions per year. The 2008 SIP must demonstrate that the NAAQS can be attained by March 23, 2012, unless the USEPA grants an extension which could make the deadline March 23, 2017 (CAAA §179(d)(3)). The 2008 SIP also incorporates provisions of the 2006 Settlement Agreement between the District and the City of Los Angeles Department of Water & Power (City) to expand dust control measures to additional areas at Owens Lake in order to attain the NAAQS as soon as practicable (GBUAPCD, 2006b).

1.1 FEDERAL CLEAN AIR ACT AND THE OWENS VALLEY SIP HISTORY

On July 1, 1987, the USEPA revised the NAAQS, replacing total suspended particulates (TSP) with PM_{10}, a new indicator for particulate matter. PM_{10} is the term given to airborne particulate matter 10 microns in diameter and smaller. The intent of this health-based standard for particulate matter is to prevent airborne concentrations of suspended particles that are injurious to human health. PM_{10} can penetrate deep into the respiratory tract, and lead to a variety of respiratory problems and illnesses.

On August 7, 1987, the USEPA designated the southern Owens Valley (known as the Owens Valley Planning Area or OVPA) as one of the areas in the nation that violated the new PM_{10} NAAQS. Subsequent air quality monitoring by the District has shown that the bed of Owens Lake—most of which is owned by the State of California and managed by the California State Lands Commission (CSLC) —is the major source of PM_{10} emissions contributing to air quality violations in the Owens Valley Planning Area. The Owens Lake bed is considered an anthropogenic (human caused) source of PM_{10} because the City of Los Angeles' Aqueduct diverts water sources that historically supplied the lake. In January 1993, the southern Owens Valley was reclassified as "serious non-attainment" for PM_{10}.

The USEPA required the State of California to prepare a state implementation plan (SIP) for the Owens Valley Planning Area that demonstrated how PM_{10} emissions would be decreased to prevent violations of the NAAQS. The District is the agency delegated by the State to fulfill this requirement. In accordance with Section 189(b) of the CAAA, an Attainment SIP that demonstrates conformance with the federal air quality standards through the implementation of a program of control measures was required to be submitted to the USEPA by February 8, 1997. In November of 1998, the District adopted a SIP, which was approved by USEPA on August 17,

1999. The 1998 SIP provided for a five-year extension of the deadline for attainment, and for a SIP Revision in 2003 that would determine the final control strategy to attain the NAAQS by December 31, 2006.

On November 13, 2003, the District approved the 2003 Revised State Implementation Plan for the Owens Valley Planning Area (2003 SIP), which was later approved by the California Air Resources Board. The 2003 SIP is currently implemented under Board Order #03111301, which primarily addresses the PM_{10} control requirements to reduce wind-blown PM_{10} emissions from the exposed playa at Owens Lake. The 2003 SIP control strategy requires using shallow flooding, managed vegetation, and/or gravel coverings to accomplish PM_{10} emission reductions on 29.8 square miles of the Owens Lake bed. The 2003 SIP was intended to demonstrate attainment with the PM_{10} NAAQS by December 31, 2006 by implementing control measures over the three years prior to that date. A USEPA policy decision made after the adoption of the 2003 SIP, however, changed the interpretation of the attainment demonstration deadline. USEPA's new policy on attainment demonstrations now requires three years of ambient air monitoring prior to the attainment date (December 31, 2006 for the OVPA) to show that there have been no violations of the NAAQS (USEPA, 2007a). Because many of the dust control measures were not completed until the end of 2006, numerous NAAQS violations occurred during the three-year attainment demonstration period. Consequently, the USEPA did not take action on the approval or disapproval of the 2003 SIP, but it is currently enforced by the District. By December 31, 2006, the City met their deadline and had implemented dust control measures on all 29.8 square miles of the lake bed as anticipated in the 2003 SIP.

In 2006, a dispute arose between the District and the City regarding requirements to control dust from additional areas at Owens Lake beyond the 29.8 square miles identified in the 2003 SIP. On December 4, 2006 a Settlement Agreement was approved by both parties to resolve this dispute. Under the major provisions of this agreement, the City agreed to implement dust control measures on a total of 43 square miles of the lake bed by April 1, 2010 and the District agreed to revise the 2003 SIP before March 1, 2008 to incorporate the provisions of the Settlement Agreement (GBUAPCD, 2006b).

1.2 ELEMENTS OF THE 2008 SIP

The 2008 SIP includes an analysis of the air quality impacts caused by the wind-blown PM_{10} from Owens Lake, estimates of the quantity of PM_{10} emitted, a discussion of control measures, an analysis of the emission reductions achieved through 2006 and an air quality modeling analysis that demonstrates it is possible to attain the PM_{10} standard with the proposed additional control measures. The following is a brief description of the contents of the 2008 SIP:

- Chapter 2 describes the Owens Valley Planning Area and provides a history of Owens Lake and the air pollution problem.

- Chapter 3 includes a summary of PM_{10} air pollution measurements taken in the Owens Lake area, a description of sensitive airsheds in the area, and an assessment of how air quality in the Planning Area compares to the federal standards.

- Chapter 4 contains the PM_{10} emissions inventory summary from wind erosion and other sources in the southern Owens Valley.

- Chapter 5 describes the three PM_{10} control measures that the District, in cooperation with the City, has developed and that have been found to be feasible and effective on Owens Lake: Shallow Flooding, Managed Vegetation, and Gravel Cover. It also describes the "Moat & Row" alternative PM_{10} control measure proposed by the City for implementation on limited areas of the lake bed.

- Chapter 6 describes the air quality modeling method that the District used to show that the proposed control strategy would bring the Owens Valley into attainment with the PM_{10} NAAQS.

- Chapter 7 sets forth the control strategy and describes how the control measures will be placed on the lake bed to accomplish the overall level of control that is needed upon completion.

- Chapter 8 contains the Board Order that will be issued to the City of Los Angeles to implement the 2008 SIP control strategy.

- References are listed at the end of each chapter, and are summarized in a composite list in Chapter 9.

- Definitions, terms, acronyms and measurement units are defined in a glossary in Chapter 10.

- The declaration of the Board Clerk and associated resolutions are contained in Chapter 11.

- Appendices to the 2008 SIP include daily PM_{10} data summaries, air quality dispersion modeling results, and additional 2008 SIP support documents including public comments on the draft document and the District's responses for the final (see List of Appendices in the Table of Contents).

- An Environmental Impact Report (EIR) has also been prepared for the project. In conjunction with previous environmental analyses performed by both the District and the City of Los Angeles, the EIR for the 2008 SIP analyzes the proposed project's impacts on the environment and requires mitigation measures to reduce or eliminate those impacts.

1.3 REFERENCES

GBUAPCD, 2006b. Great Basin Unified Air Pollution Control District, Settlement Agreement between the District and the City to resolve the City's challenge to the District's Supplemental Control Requirement determination issued on December 21, 2005 and modified on April 4, 2006, GBUAPCD, Bishop, California, December 4, 2006.

USEPA, 2007a. United States Environmental Protection Agency, Proposed Finding of Failure to Attain; State of California, Owens Valley Nonattainment Area; Particulate Matter of 10 Microns or Less, EPA-R09-OAR-2007-0091, FRL-8291-1, Federal Register, Volume 72, No. 56, March 23, 2007, pp 13723-13726.

CHAPTER 2

Owens Valley Planning Area

FIGURES

2

Owens Valley Planning Area

2.1 PROJECT LOCATION AND LAND OWNERSHIP

2.1.1 Location

The Owens Valley Planning Area (OVPA) is located in Inyo County in eastern-central California. It is situated at the south end of the deep, long, narrow Owens Valley with the Sierra Nevada to the west (max. elev. 14,495 feet), the Inyo Mountains to the east (max. elev. 14,246 ft.), and the Coso Range to the south (max. elev. 8,160 ft.) (Figure 2.1, Figure 2.2). The predominantly dry, alkaline Owens Lake bed is approximately eight miles south of the community of Lone Pine on U.S. Highway 395, 60 miles north of the city of Ridgecrest, and 35 miles west of Death Valley. The communities of Olancha and Keeler are located on the southwestern and eastern shores of the lake bed, respectively. The bed of Owens Lake is defined as the area below 3,600 feet above mean sea level (all elevations will be given in feet above mean sea level). The lake bed extends about seventeen miles north and south and ten miles east and west and covers an area of approximately 110 square miles (70,000 acres). The majority of the lake bed (over 95%) is state land under the jurisdiction of the California State Lands Commission (CSLC). The remaining portions of the lake bed are owned by the City of Los Angeles and other private owners.

During the years from 2000 through 2006 dust control measures were implemented on 29.8 square miles (19,072 acres) of the former lake bed. The map in Figure 2.3 shows the areas where existing dust controls were constructed by the City of Los Angeles Department of Water & Power (City) under the requirements of the 2003 SIP. In accordance with a 2006 Settlement Agreement between the District and the City (GBUAPCD 2006b), the City will implement dust control measures on an additional 13.2 square miles by April 1, 2010 in the Supplemental Dust Control Areas and Channel Areas shown in Figure 2.3. After that date, dust controls may be required in areas shown as Study Areas if they are found to cause or contribute to an exceedance of the federal standard at the shoreline.

Figure 2.3 shows the location of the current Managed Vegetation and Shallow Flooding control measures that were implemented by the end of 2006. Under the requirements of the 2003 SIP, Managed Vegetation, Shallow Flooding and Gravel Blanket are considered as Best Available Control Measures (BACM) and may be applied as necessary anywhere on the Owens Lake bed to control windblown dust, subject to completion of appropriate environmental impact analyses and approval by the underlying land owner(s).

For the 13.2 square miles of additional Supplemental Dust Controls required by this SIP, Shallow Flooding is planned for at least 9.2 square miles of the area (Figure 2.3). On at most 3.5 square miles the City is allowed, at their sole discretion, to implement an alternative non-BACM measure known as Moat & Row. This measure is being tested by the City in 2007-08. If Moat & Row is implemented by the City and proven to be successful, it may remain in place on the lake bed in the locations shown in Figure 2.3. If the Moat & Row control measure cannot achieve the necessary PM_{10} control efficiency for the indicated areas (ranges from 50% to 99%), the unsuccessful Moat & Row areas must be converted to Shallow Flooding. The remaining 0.5 square miles of dust controls will be applied on the Channel Area. Because of significant existing resource issues and regulatory constraints in this area, the City will implement dust controls that prevent dust emissions and protect or enhance the existing natural resources.

2.1.2 Land Ownership

As mentioned above, approximately 68,000 acres, or 95 percent, of the Owens Lake bed is owned by the State of California and managed by the California State Lands Commission (CSLC). Most of this lake bed state-owned land is leased for a variety of purposes. U.S. Borax leases over 16,000 acres of lake bed for the purposes of extracting trona ore (an evaporite sodium carbonate mineral). In addition, there are a few agricultural (grazing) leases near historic shoreline areas. Most of the remaining state-owned lake bed areas are leased from the state by the City of Los Angeles for the purpose of developing and implementing PM_{10} control measures. Most of the remaining 5 percent of the lake bed, or approximately 2,800 acres, is owned by the City of Los Angeles and is managed by the Los Angeles Department of Water and Power. The City's lands are in the Owens River delta and on the lake bed west of Keeler. A few small areas below and considerable areas above the historic shoreline are federal lands managed by the U.S. Bureau of Land Management (BLM). A few small isolated private land parcels are also located on the lake bed. All control measures and supporting infrastructure are owned by the City of Los Angeles, on property owned by the City or on leases or easements from other underlying owners.

2.2 PROJECT HISTORY

2.2.1 Environmental Setting and Effects of Diversions on Owens Lake

2.2.1.1 Geologic History

Owens Lake is part of a chain of lakes formed between 10,000 and 16,000 years ago. The lakes spanned from Mono Lake (previously a much larger lake known as Lake Russell) in the north to Lake Manley, the southeastern-most lake of the chain, in what is now known as Death Valley. During much of this time, water from the Owens Valley basin flowed out of Owens Lake, through Rose Valley and into China Lake (which occupied the Ridgecrest area). The high stand of Owens Lake that produced the shorelines at an elevation of 3,880 is estimated to have occurred 15,000-16,000 years ago. Since that time, the surface extent of the water of Owens Lake has been diminishing. However, two deep cores on the lake bed failed to identify any previous episodes of complete desiccation (Saint-Amand, *et al*., 1986, Smith and Bischoff, 1993). Uplift processes in the Coso Range, combined with a post-glacial drying trend, eliminated overland outflow from the basin about 3,000 years ago. As a result, the lake basin became closed, losing water only through surface evaporation and transpiration. This closed hydrologic system, combined with the arid environment, created the highly saline condition of remaining surface waters and soils at the bottom of the Owens Lake basin. Even during historic periods in the 1800s when it was used as a navigable waterway, Owens Lake was an alkali lake.

2.2.1.2 Historic Lake Levels

Although historic lake levels were as high as 3,597 feet in 1878 (Lee, 1915), surface water diversions in the Owens Valley over the last 130 years have reduced the lake to less than one-third of its original size and about 5 percent of its original volume (Mihevc *et al.*, 1997). From the 1860s to the early 1900s, withdrawals from the Owens River for agricultural purposes

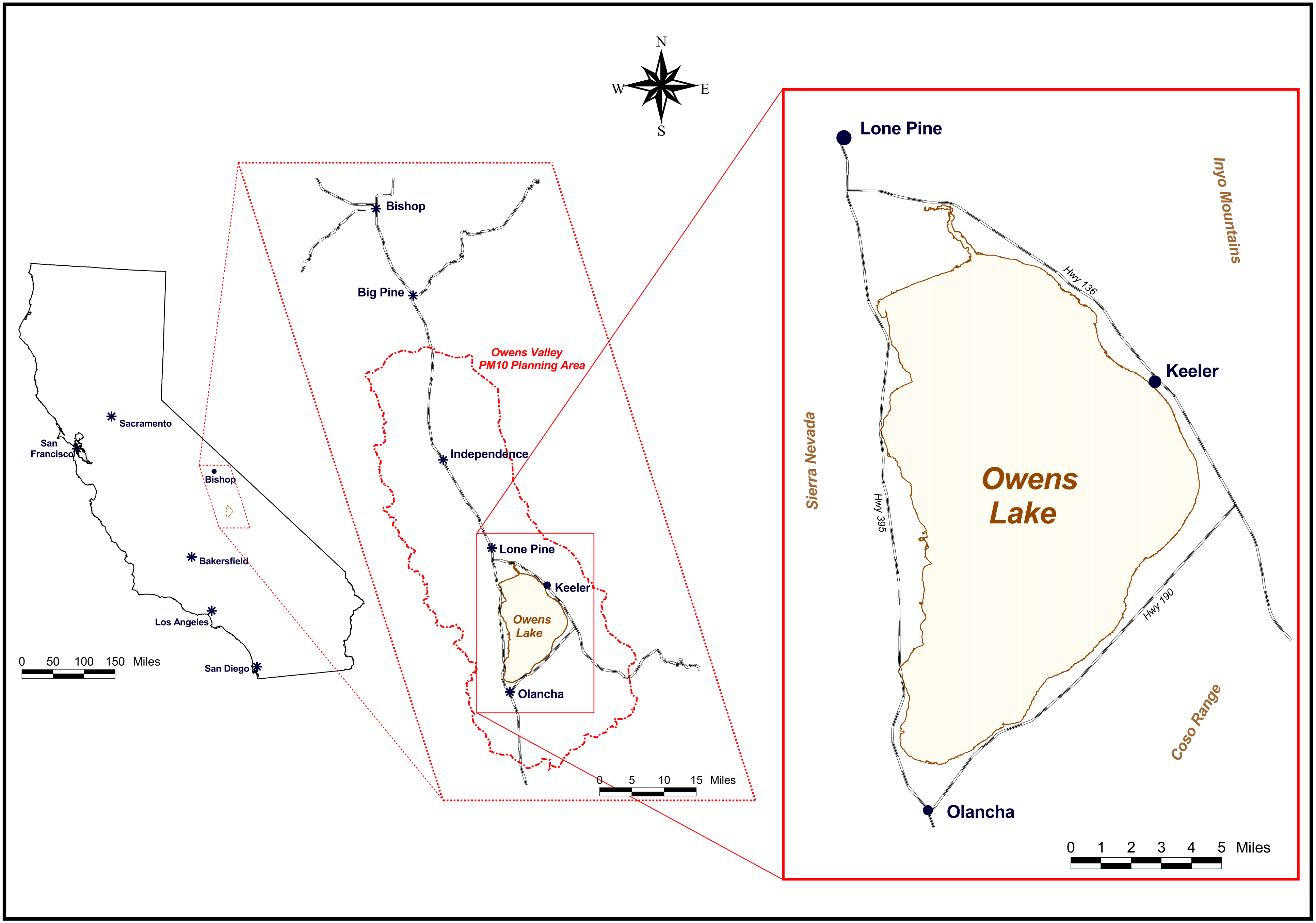

Figure 2.1 - Vicinity map

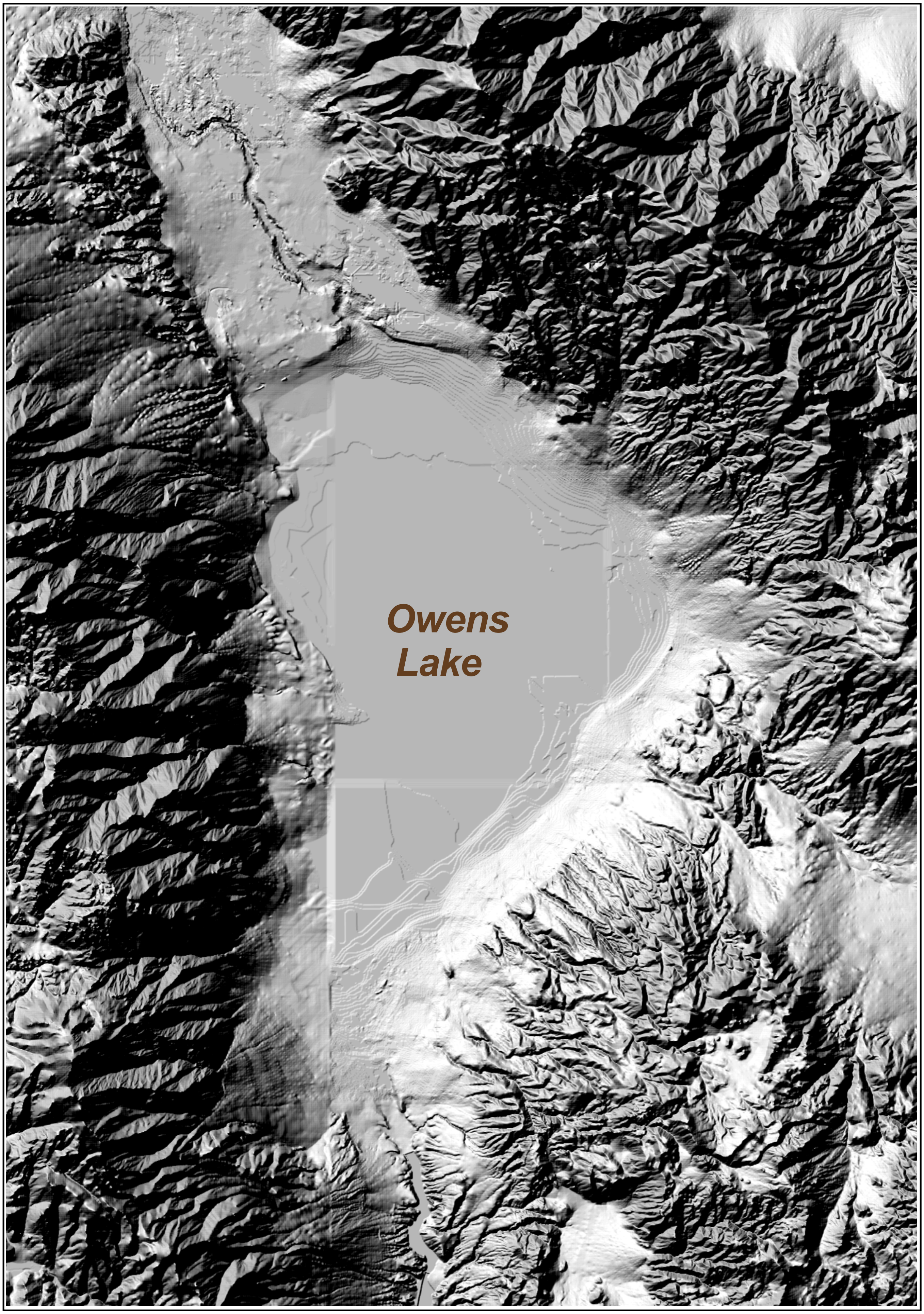

Figure 2.2 - Relief map

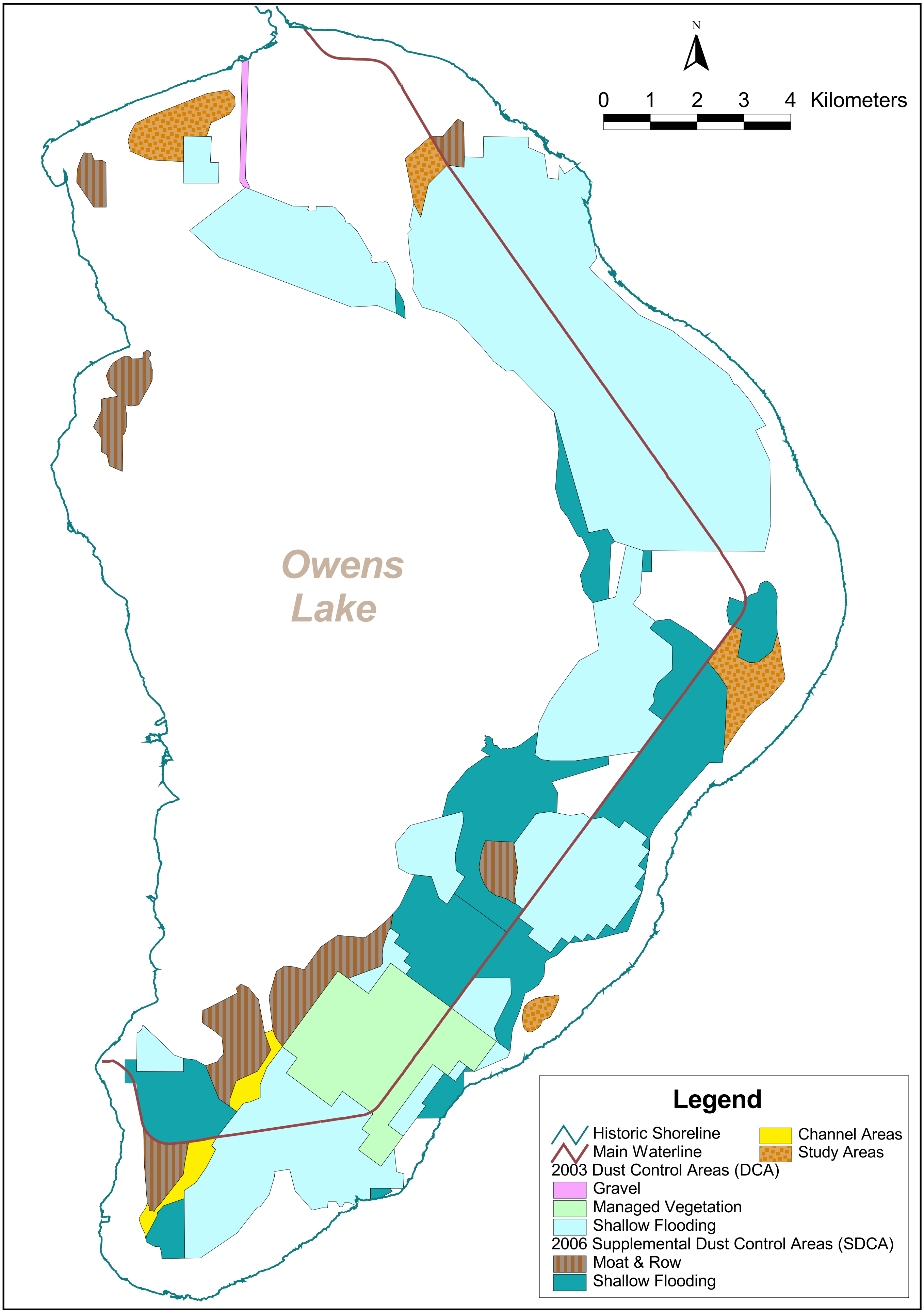

Figure 2.3 - 2008 Dust Control Measure footprint map

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substantially reduced surface water inflow to the lake. Extensive irrigation projects compounded by drought caused the lake level to drop as low as 3,565 feet in 1906. However, as the drought ended and lands purchased by the City of Los Angeles were taken out of agricultural production, by 1912 the level had risen to 3,579 feet (Lee, 1915). In 1913, the City completed a fresh water aqueduct system and began diverting waters of the Owens River south to the City of Los Angeles. Demand for exported water increased as Los Angeles grew, and diversions for irrigation continued in the Owens Valley (mainly on City-owned property). These factors resulted in Owens Lake becoming virtually dry by 1930—its level having dropped to its current ordinary high water elevation of about 3,554 feet (Saint-Amand, et al., 1986 and LADWP, 1966).

A former or stranded shoreline was left behind at an approximate elevation of 3,600 feet. The former shoreline bounds the lake bed playa in aerial photographs and on most maps. The area enclosed by the stranded historic shoreline is approximately 110 square miles (70,400 acres). Today, the remnant Owens Lake consists of a hypersaline permanent brine pool about 26 square miles (16,500 acres) in size in the lowest portion of the basin, surrounded by dry playa soils and crusts. The ordinary high water mark of this remnant brine pool has been defined by the U.S. Army Corps of Engineers to be that portion of the lake basin below 3,553.55 feet. Evaporite deposits and brines cover much of the playa area; the concentration of dissolved solids (salts) can be as high as 77 percent by weight (GBUAPCD, 2001b).

2.2.1.3 Plants and Wildlife

The Owens Valley has been described as having a very rich variety of plants with over 2,000 species represented in the region, though they are limited in distribution at Owens Lake to the relic shoreline and nearby alluvial fans (DeDecker, 1984). Riparian, alkaline meadow and alkali seep plant communities, which circumscribe Owens Lake, provide important habitat for resident and migratory wildlife species. Many of the diverse wildlife resources that are characteristic of the Sierra Nevada, Inyo, and Coso mountain ranges surrounding Owens Lake will occasionally be found on the valley floor, particularly during winter. Heindel and Heindel (1995) report as many as 320 bird species for the Owens Valley floor including permanent residents, summer residents, winter residents, and migrants. Ephemerally flooded areas in the vicinity of Owens Lake provide excellent resting and foraging habitat for migrants and winter residents and winter prime opportunities for bird watching. Several sensitive wildlife species are found at and around Owens Lake.

2.2.1.4 Cultural History

The Owens Valley has attracted the interest of archeologists since at least the 1930s. The Riddells (Riddell, 1951, Riddell and Riddell, 1956) conducted the major work in the region in the 1940s and 1950s, recording several sites on the perimeter of Owens Lake including important sites at Cottonwood Creek and Rose Spring. Two California State Historic Landmarks and two California Points of Historic Interest are located in the vicinity of Owens Lake. Ethnographic data indicate that the east shore of Owens Lake was used by Native American groups. Historic resources related to mining and transportation have been identified above the stranded shoreline.

2.2.2 Legal History

2.2.2.1 Natural Soda Products Co. vs. City of Los Angeles

By the late 1920s, the majority of the lake bed was dry and remained so until 1937. As the lake dried and the lake bed was uncovered, mineral deposits of trona ore were exposed and became available for extraction. In 1937, 1938, and 1939, the City released large quantities of water onto the lake bed, flooding the mineral deposits and causing extensive damage to the chemical processing plants. In 1937, the Natural Soda Products Company, a lessee of mineral rights from the State of California, sued the City of Los Angeles for damages to its chemical plant and business caused by the flooding of Owens Lake. The court decided the case in 1943 and a judgment for damages was awarded. *Natural Soda Products Co. vs. City of Los Angeles* 1943, 23 Cal.2d 193 [143 P.2d 12] established that "the city, by its long continued diversion of the waters of the Owens River, incurred an obligation to continue that diversion…at least so long as it continued to maintain its aqueduct." In 1939, the State, as owner of the lake bed, brought an action in *People vs. the City of Los Angeles* 1939, 34 Cal.2d 695 [214 P.2d 1] to define whether the City's obligation could be enforced by injunction, and if so, to determine the extent of the injunction. The trial court, citing the principles set forth in *Natural Soda Products*, later granted an injunction and prohibited the City from: (a) diverting any waters from the Mono Basin watershed into or onto Owens Lake, and (b) diverting any waters of the Owens River and its tributaries into or onto Owens Lake "which are not in excess of an amount equal to the reasonable capacity of [the City's] aqueduct system and all of its component facilities reasonably operated." The City of Los Angeles appealed the trial court's injunction.

In 1950, the appeal of *People vs. the City of Los Angeles* was finally resolved. The appellate court modified and affirmed the lower court's decision regarding the injunction. The two significant modifications were as follows. First, since waters of the Mono Basin watershed and Owens Valley waters become mixed, the first part of the injunction was technically unenforceable. It was, therefore, amended to prohibit increasing the natural flow of the Owens River, by diverting into it waters of the Mono Basin, if such a diversion would necessitate the release of water into or onto Owens Lake. Second, the City was found to be under no obligation to spread surplus water onto land owned in the Owens Valley in excess of amounts that could reasonably be used on such land or stored underground for future beneficial use. Importantly, it also reaffirmed that portion of the injunction regarding "diverting any waters out of [the City's] aqueduct system onto Owens Lake, or in any way releasing any waters to be deposited into or onto Owens Lake at any time, unless the flow of water of the Owens Valley watershed is in excess of an amount equal to the reasonable capacity of [the City's] aqueduct system and all of its component facilities reasonably operated."

Although the Owens Lake dust control measures are not expected to interfere with mining interests, the shallow flooding and managed vegetation control measures involve releasing water onto Owens Lake, which is an action that could have conflicted with the injunction. In September of 2000, the Riverside County Superior Court modified that injunction to allow for the implementation of dust control measures on Owens Lake (*People v. City of Los Angeles, et al.*, (2000) Riverside County Superior Court, Case 34042).

2.2.2.2 Senate Bill 270

In 1982, the City applied for a permit from the District to construct and operate a geothermal electric generating plant in the Coso Known Geothermal Resource Area. The permit was denied based on the assertion that the City was in violation of air pollution rules and regulations elsewhere in the region. Specifically, District Rule 200 considered the water-gathering operations of the City to be a "facility" responsible for the particulate emissions from Owens Lake and concluded that an air quality permit was required for the City's Aqueduct operations.

After failure of efforts to petition the action, a negotiated settlement emerged in Senate Bill 270 (SB 270) sponsored by Senator Dills in 1983. SB 270 (Cal. Health and Safety Code §42316) exempted the City of Los Angeles' water-gathering operations from state air quality permit regulations. It provided that the City must fund control measure development and must implement reasonable measures ordered by the District to attain compliance with the state and federal ambient air quality standards at Owens Lake. By law, the District-mandated control measures may not affect the City's right to produce, divert store or convey water. Chapter 8 of this document contains the text of SB 270 and includes additional information on Cal. Health and Safety Code §42316 as it applies to the Board order to implement dust control measures.

2.2.3 Regulatory History

2.2.3.1 PM_{10} Nonattainment Designation

In 1987, the United States Environmental Protection Agency (USEPA) revised the National Ambient Air Quality Standards (NAAQS), replacing total suspended particulates (TSP) as the indicator for particulate matter with a new indicator called PM_{10}. PM_{10} is defined as particulate matter that has an average aerodynamic diameter less than or equal to 10 microns. Ten microns are about one-seventh the diameter of a human hair. The standards for PM_{10} were set at 150 micrograms per cubic meter (μg/m^3) for a 24-hour average and 50 μg/m^3 for an annual average. At the same time, USEPA set forth regulations for implementing the revised NAAQS, and announced the policy for development of SIPs and supporting control strategies. Also in 1987, USEPA identified the southern Owens Valley (known as the Owens Valley Planning Area) as one of the areas in the nation that violated the PM_{10} NAAQS. Subsequent air quality monitoring by the District showed that the dried bed of Owens Lake is the predominant source of PM_{10} emissions contributing to air quality violations in the Owens Valley Planning Area. Extremely high PM_{10} concentrations (over 12,000 μg/m^3 or more than 80 times the standard) have been verified downwind of Owens Lake. Inter-basin transport of PM_{10} into the southern Owens Valley is inconsequential.

Consequently, the USEPA required the State of California to prepare a SIP for the Owens Valley Planning Area that demonstrates how PM_{10} emissions will be decreased to comply with the NAAQS. The District is the agency delegated by the state to fulfill this requirement. An initial SIP was prepared by the District in 1988 (GBUAPCD, 1988), approved by the California Air Resources Board (CARB), and forwarded to the USEPA. No action was taken by USEPA to approve or disapprove the 1988 SIP.

2.2.3.2 1990 Clean Air Act Amendments

In November 1990, the federal Clean Air Act Amendments (CAAA) were signed into law, setting into motion new statutory requirements for attaining the PM_{10} NAAQS. All areas in the United States that were previously classified as federal non-attainment areas for PM_{10}, including the southern Owens Valley, were designated as "moderate" PM_{10} non-attainment areas. In November 1991, the District prepared an addendum to the 1988 SIP that updated the air quality information and the work performed since 1988 (GBUAPCD, 1991).

Section 188(b) of the CAAA specified that any area that could not attain the NAAQS by December 1994 would subsequently be reclassified as a "serious" PM_{10} non-attainment area. In January 1993, USEPA completed its initial reclassification process, and included the southern Owens Valley among five nationwide areas reclassified as "serious," effective February 8, 1993.

Section 189(b) of the CAAA further specified that a SIP revision was due within eighteen months of the reclassification (by August 8, 1994). The revision was to assure that implementation of “best available control measures” (BACM), including “best available control technology” (BACT), would be effective within four years of the reclassification date. A Best Available Control Measures SIP was prepared in June 1994 and approved by the CARB (GBUAPCD, 1994).

The CAAA required that by February 8, 1997, a PM_{10} Attainment SIP must be submitted to the USEPA that (a) included preferred and contingency PM_{10} control strategies, (b) provided air quality modeling that demonstrated attainment of the federal air quality standards from the implementation of these controls, and (c) provided quantitative milestones for “reasonable further progress” reporting to the USEPA. The CAAA further require that the PM_{10} NAAQS be attained by December 31, 2001. On November 16, 1998, the District adopted a SIP, which was approved by USEPA on August 17, 1999. That 1998 SIP provided for a five-year extension of the deadline for attainment, and for a SIP revision in 2003 that would determine the final control strategy to attain the NAAQS by December 31, 2006 (GBUAPCD, 1998a).

On November 13, 2003, the District adopted the 2003 Revised State Implementation Plan for the Owens Valley Planning Area (2003 SIP), which was later approved by the CARB. The 2003 SIP is currently implemented under Board Order #031113-01, which primarily addresses the PM_{10} control requirements to reduce wind-blown PM_{10} emissions from the exposed playa at Owens Lake. The 2003 SIP control strategy requires using shallow flooding, managed vegetation, and gravel coverings to accomplish PM_{10} emission reductions on 29.8 square miles of the Owens Lake bed (GBUAPCD, 2003e). It also contained contingency measure provisions that require the City to control additional lake bed areas beyond the 29.8 square miles, if necessary. The USEPA did not take action on the approval or disapproval of the 2003 SIP, but it is currently enforced by the District. By December 31, 2006, the City had implemented dust control measures on all 29.8 square miles of the lake bed as required in the 2003 SIP.

In December 2005, a dispute arose between the District and the City regarding requirements to control dust from additional areas at Owens Lake beyond the 29.8 square miles identified in the 2003 SIP (Schade, 2005 and Schade, 2006). On December 4, 2006 a Settlement Agreement was approved by both parties to resolve this dispute (GBUAPCD, 2006b). Under the provisions of this agreement, the City agreed to implement dust control measures on an additional 13.2 square miles of the lake bed by April 1, 2010 and the District agreed to revise the 2003 SIP before March 1, 2008 to incorporate the provisions of the Settlement Agreement. This 2008 SIP fulfills the District’s commitment.

At the time the 2003 SIP was approved by the District and the CARB in November 2003, the USEPA policy direction on PM_{10} attainment demonstrations was that the control measures that were needed to demonstrate attainment must be implemented by December 31, 2006. After the 2003 SIP was adopted, the USEPA policy direction changed to require three continuous years of air quality data without violations prior to December 31, 2006 to demonstrate attainment. This revised policy direction effectively made the 2003 SIP attainment demonstration deficient, since all the control measures should have been implemented before the end of 2003 to meet the 2006 attainment deadline. Because it takes two to three years to implement the Shallow Flooding and Managed Vegetation control measures, the construction of the 2003 SIP dust control measures were not completed until the end of 2006. Numerous NAAQS violations occurred during the

3-year attainment demonstration period. As a result, the USEPA made the finding that the Owens Valley failed to attain the standard as required under CAAA §189(d).

On March 23, 2007, the USEPA published a finding that the Owens Valley Planning Area did not attain the 24-hour National Ambient Air Quality Standard (NAAQS) for particulate matter of 10 microns or less (PM_{10}) by December 31, 2006 as mandated by the CAAA (USEPA, 2007a). As a result of this finding, the Owens Valley SIP must be revised to include a control strategy that will provide for attainment in the Owens Valley Planning Area as soon as practicable, by achieving at least a 5 percent reduction in PM_{10} emissions per year. The 2008 SIP must demonstrate that the NAAQS can be attained by March 23, 2012, unless the USEPA grants an extension which could extend the deadline up to March 23, 2017 (CAAA §179(d)(3)). The USEPA may consider the severity of nonattainment and the feasibility of applying available control measures in deciding if an extension should be granted. In accordance with CAAA §189(d), the revised SIP must be submitted to the USEPA by December 31, 2007.

This 2008 SIP revises the 2003 SIP and includes an updated analysis of the particulate matter air pollution problem in the Owens Valley and a revised control strategy to bring the area into attainment with the federal air quality standard for particulate matter as soon as practicable. This 2008 SIP also incorporates provisions of the Settlement Agreement between the District and the City to expand dust control measures to additional areas at Owens Lake in order to attain the NAAQS as soon as practicable (GBUAPCD, 2006b).

2.2.3.3. Exceptional Events Rule

On March 22, 2007, the USEPA adopted a rule to allow the exclusion of monitored or modeled air quality exceedances and violations that were caused by exceptional or natural events. Exceptional events can be human-caused events that are not expected to recur, and natural events, which are considered to be caused by natural sources such as, wildland fires, volcanic activities, or extreme-wind events. This rule replaced the USEPA's natural events policy that was approved in 1996. The rule defines the term "exceptional event" to mean an event that:

- (i) Affects air quality;
- (ii) Is not reasonably controllable or preventable;
- (iii) Is an event caused by human activity that is unlikely to recur at a particular location or a natural event; and
- (iv) Is determined by USEPA through the process established in these regulations to be an exceptional event.

USEPA defined a "natural event" as an event in which human activity plays little or no direct causal role. As this pertains to wind blown dust from dry lake beds, the USEPA's rulemaking cites the U.S. House of Representatives report on approving CAAA §188(f), in which they discussed a circumstance in which recurring emissions from a source should be considered to be caused by human activity. Both the House and Senate committee reports for the 1990 CAAA specifically cited the case of wind-blown dust from Owens and Mono Lakes, and agreed with USEPA's statement that high concentrations of dust from the lake bed were due to human activity, i.e., the long-term diversion of water from a lake (USEPA, 2007b, U.S. Senate, 1989, U.S. House of Representatives, 1990).

Although violations caused by wind blown dust from the Owens Lake bed do not qualify as natural events, the exceptional events rule can be applied to dust events that pass two separate and independent tests:

(i) that BACM for wind blown dust was in place and properly maintained to the extent possible at the time of the event, and
(ii) that unusually high winds were the cause of the exceedance.

At Owens Lake, BACM would be Shallow Flooding, Managed Vegetation, Gravel Blanket or any other control measure approved by the Air Pollution Control Officer as BACM for Owens Lake. Because these BACM measures are intended to control dust during high wind events, it would be necessary to demonstrate that winds were "unusually high" based on historical records for the Owens Lake area. If it is determined that an exceptional event occurred, then a plan would be developed to determine what measures should be taken to safeguard public health should such an event recur.

2.3 REFERENCES

DeDecker, 1984. DeDecker, Mary, Flora of the Northern Mojave Desert, California, California Native Plant Society Special Publication No. 7, Berkeley, 1984.

GBUAPCD, 1988. Great Basin Unified Air Pollution Control District, State Implementation Plan and Negative Declaration/Initial Study for Owens Valley PM_{10} Planning Area, GBUAPCD, Bishop, California, December 1988.

GBUAPCD, 1991. Great Basin Unified Air Pollution Control District, Owens Valley PM_{10} Planning Area State Implementation Plan Addendum, GBUAPCD, Bishop, California, November 1991.

GBUAPCD, 1994. Great Basin Unified Air Pollution Control District, Owens Valley PM_{10} Planning Area Best Available Controls Measures State Implementation Plan, GBUAPCD, Bishop, California, June 1994.

GBUAPCD, 1998a. Great Basin Unified Air Pollution Control District, Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan, GBUAPCD, Bishop, California, November 16, 1998.

GBUAPCD, 2001b. Great Basin Unified Air Pollution Control District, Hydrogeology Archive 2000, electronic publication by the GBUAPCD, compact disk with data and reports on the hydrology and geology of the Owens Lake area, GBUAPCD, Bishop, California, March 29, 2001.

GBUAPCD, 2003. Great Basin Unified Air Pollution Control District, Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan - 2003 Revision, GBUAPCD, Bishop, California, November 13, 2003.

GBUAPCD, 2006b. Great Basin Unified Air Pollution Control District, Settlement Agreement between the District and the City to resolve the City's challenge to the District's Supplemental Control Requirement determination issued on December 21, 2005 and modified on April 4, 2006, GBUAPCD, Bishop, California, December 4, 2006.

Heindel and Heindel, 1995. Heindel T., and J. Heindel, "Birds" in Putnam, J. and G. Smith, eds. Deepest Valley: Guide to Owens Valley, Mammoth Lakes, California, Genny Smith Press, 1995.

LADWP, 1966. Los Angeles Department of Water and Power, Record of means and totals, unpublished data base, 1966.

Lee, 1915. Lee, C.H., Report on Hydrology of Owens Lake Basin and the Natural Soda Industry as Effected by the Los Angeles Aqueduct Diversion, Los Angeles Department of Water and Power internal report, Los Angeles, California, 1915.

Mihevc, *et al*., 1997. Mihevc, Todd M., Gilbert F. Cochran, and Mary Hall, Simulation of Owens Lake Water Levels, report prepared for Great Basin Unified Air Pollution Control District, Bishop, California, by Desert Research Institute, Reno, Nevada, June 1997.

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

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

Saint-Amand, et al., 1986. Saint-Amand, P., L.A. Mathews, C. Gaines and R. Reinking, Dust Storms from Owens and Mono Valleys, California, Naval Weapons Center, China Lake, California, NWC TP 6731, 1986.

Schade, 2005. Great Basin Unified Air Pollution Control District, Owens Lake Dust Control: Air Pollution Control Officer's 2004-2005 Determination Requiring the City of Los Angeles to Implement, Operate and Maintain Air Pollution Control Measures on Additional Areas of the Owens Lake Bed, Letter from Theodore D. Schade, Air Pollution Control Officer, GBUAPCD, Bishop, California to Ronald Deaton, General Manager, Los Angeles Department of Water and Power, Los Angeles, California, December 21, 2005.

Schade, 2006. Great Basin Unified Air Pollution Control District, Modified Determination and Response to the City of Los Angeles' Alternative Analysis of the Air Pollution Control Officer's 2004-2005 Supplemental Control Requirements Determination (5 volumes); Letter from Theodore D. Schade, Air Pollution Control Officer, GBUAPCD, Bishop, California to Ronald Deaton, General Manager, Los Angeles Department of Water and Power, Los Angeles, California, April 4, 2006.

Smith and Bischoff, 1993. Smith, G.I. and J.L. Bischoff, editors, Core OL92-2 from Owens Lake, Southeast California, US Geological Survey Open File Report 93-683, 1993.

USEPA, 2007a. United States Environmental Protection Agency, Proposed Finding of Failure to Attain; State of California, Owens Valley Nonattainment Area; Particulate Matter of 10 Microns or Less, EPA-R09-OAR-2007-0091, FRL-8291-1, Federal Register, Volume 72, No. 56, March 23, 2007, pp 13723-13726.

USEPA, 2007b. United States Environmental Protection Agency, Treatment of Data Influenced by Exceptional Events, EPA-HQ-OAR-2005-0159; FRL-8289-5, Federal Register, Volume 72, No. 55, March 22, 2007, pp.13560-13581.

U.S. House of Representatives, 1990. Committee on Energy and Commerce. Clean Air Act Amendments of 1990. 101st Cong., 2nd session, 1990. House Report 101-490(1), May 17, 1990.

U.S. Senate, 1989. Committee on Environment and Public Works. Clean Air Act Amendments of 1990. 101st Cong., 1st sess., 1989. Senate Report 101-228, December 20, 1989.

CHAPTER 3

Air Quality Setting

FIGURES

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CHAPTER 3

Air Quality Setting

3.1 WEATHER AND CLIMATE

The Owens Valley Planning Area (OVPA) is located in the southern end of the Owens Valley in Inyo County, California. Owens Lake is bounded by the Inyo Mountains to the east, and the Sierra Nevada to the west, which rise over 10,000 feet above the lake bed surface. Because it is in the rain shadow of the Sierra Nevada, annual rainfall is very low in the project area. Owens Lake averages approximately 4 inches of rainfall per year with the majority of that falling from November through April. Temperatures range from around 18ºF to 70ºF during winter, and 45ºF to 112ºF during summer. Hourly average wind speeds in the area can exceed 40 mph as measured at a 33-foot height. These winds are generally associated with the passage of low-pressure systems during winter and spring months. The leading edges of these low-pressure systems are usually cold fronts that initially produce winds from the south as the colder air mass approaches, under-running and displacing the warmer air in its path. As the leading edge of the front passes, the wind direction shifts, often resulting in converging winds from the south along the east side of the valley and from the north along the west side. Cold winds from the north typically follow the passage of the low-pressure system as high pressure begins to build back over the area.

3.2 AIR QUALITY AND AREA DESIGNATIONS

Air quality is regulated through federal, state and local requirements and standards in the project area. Under the Federal Clean Air Act, the U.S. Environmental Protection Agency (USEPA) has set ambient air quality standards to protect public health and welfare. National ambient air quality standards (NAAQS) have been set for the following criteria pollutants; particulate matter less than 10 microns (PM_{10}), particulate matter less than 2.5 microns ($PM_{2.5}$), ozone, carbon monoxide, oxides of nitrogen, sulfur dioxide, and lead. In addition, California has set air quality standards for these pollutants, which are usually more stringent, and has added to this list standards for vinyl chloride, hydrogen sulfide, sulfates and visibility-reducing particles. Table 3.1 shows the current California and national ambient air quality standards.

The OVPA has been designated by the state and the USEPA as non-attainment for the state and federal 24-hour average PM_{10} standards. The boundaries of the federal PM_{10} nonattainment area are shown in Figure 3.1. The area is designated as “attainment” or “unclassified” for all other federal ambient air quality standards. Monitoring and research conducted for more than 20 years, as well as three previous State Implementation Plans (SIPs), has determined that wind-blown dust from the dry bed of Owens Lake is the dominant cause of NAAQS violations for PM_{10} in the non-attainment area.

The USEPA designated the Owens Valley as a “serious” non-attainment area due to the frequent violations of the NAAQS for PM_{10} and the inability of the area to attain the standard by December 31, 1995. For serious PM_{10} non-attainment areas, the federal Clean Air Act Amendments of 1990 (CAAA) required the submittal of a SIP by February 8, 1997 that would bring the area into attainment with the NAAQS by December 31, 2001, if practicable. In November 1998, the District adopted the 1998 SIP, which was approved by the USEPA on August 19, 1999 (Federal Register, 1999). That 1998 SIP required the City of Los Angeles (City), the entity responsible for diverting the Lake's water and exposing the emissive lake bed, to use Best Available Control Measures (BACM), which consisted of Shallow Flooding, Managed Vegetation, and Gravel Blanket, to reduce PM_{10} emissions on 16.5 square miles of the Owens Lake bed by 2003. The 1998 SIP also provided a five-year extension of the deadline for attainment, and committed to a SIP Revision in 2003 that would determine the final control strategy to attain the NAAQS by December 31, 2006 (GBUAPCD, 1998a).

On November 13, 2003, the District approved the 2003 Revised State Implementation Plan for the Owens Valley Planning Area (2003 SIP), which was approved by the CARB in February 2004. The 2003 SIP is currently implemented under Board Order #031113-01. The 2003 SIP control strategy required the City to continue to use BACM to control emissions on a total of 29.8 square miles of the lake bed. The 2003 SIP also required the District to continue to monitor PM_{10} emissions and to require the City to implement additional controls beyond the 29.8 square miles, if necessary. (GBUAPCD, 2003)

In December 2005, a dispute arose between the District and the City regarding requirements to control dust from additional areas at Owens Lake beyond the 29.8 square miles identified in the 2003 SIP (Schade, 2005 and Schade, 2006). On December 4, 2006 a Settlement Agreement was approved by both parties to resolve this dispute (GBUAPCD, 2006b). Under the provisions of this agreement, the City agreed to implement dust control measures on an additional 13.2 square miles of the lake bed by April 1, 2010 and the District agreed to revise the 2003 SIP before March 1, 2008 to incorporate the provisions of the Settlement Agreement.

On March 23, 2007, the USEPA published a finding that the Owens Valley Planning Area did not attain the 24-hour NAAQS for PM_{10} by December 31, 2006 as mandated by the CAAA (USEPA, 2007a). As a result of this finding, the Owens Valley SIP must be revised to include a control strategy that will provide for attainment in the Owens Valley Planning Area as soon as practicable, by achieving at least a 5 percent reduction in PM_{10} emissions per year. The 2008 SIP must demonstrate that the NAAQS can be attained by March 23, 2012, unless the USEPA grants an extension which could extend the deadline up to March 23, 2017 (CAAA §179(d)(3)). The USEPA may consider the severity of nonattainment and the feasibility of applying available control measures in deciding if an extension should be granted. In accordance with CAAA §189(d), the revised SIP must be submitted to the USEPA by December 31, 2007.

At the time the 2003 SIP was approved by the District and the CARB in November 2003, the USEPA policy direction on PM_{10} attainment demonstrations was that the control measures that were needed to demonstrate attainment must be implemented by December 31, 2006. After the 2003 SIP was adopted, the USEPA policy direction changed to require three continuous years of air quality data without violations prior to December 31, 2006 to demonstrate attainment. This change in policy direction effectively made the 2003 SIP attainment demonstration deficient, since all the control measures should have been implemented before the end of 2003 to meet the attainment deadline. Because it takes two to three years to implement the Shallow Flooding and Managed Vegetation control measures, the construction of the 2003 SIP dust control measures were not completed until the end of 2006. Numerous NAAQS violations occurred during the

Table 3.1 - California and National Ambient Air Quality Standards

Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards [1]		Federal Standards [2]		
		Concentration [3]	Method [4]	Primary [3,5]	Secondary [3,6]	Method [7]
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m^3)		0.08 ppm (157 µg/m^3)		
Respirable Particulate Matter (PM10)	24 Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		—		
Fine Particulate Matter (PM2.5)	24 Hour	No Separate State Standard		35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	15 µg/m^3		
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m^3)	None	Non-Dispersive Infrared Photometry (NDIR)
	1 Hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		—	—	—
Nitrogen Dioxide (NO_2) *	Annual Arithmetic Mean	0.030 ppm (56 µg/m3)	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m^3)	Same as Primary Standard	Gas Phase Chemiluminescence
	1 Hour	0.18 ppm (338 µg/m^3)		—		
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	—	Ultraviolet Fluorescence	0.030 ppm (80 µg/m^3)	—	Spectrophotometry (Pararosaniline Method)
	24 Hour	0.04 ppm (105 µg/m^3)		0.14 ppm (365 µg/m^3)	—	
	3 Hour	—		—	0.5 ppm (1300 µg/m^3)	
	1 Hour	0.25 ppm (655 µg/m^3)		—	—	—
Lead[8]	30 Day Average	1.5 µg/m^3	Atomic Absorption	—	—	—
	Calendar Quarter	—		1.5 µg/m^3	Same as Primary Standard	High Volume Sampler and Atomic Absorption
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per kilometer — visibility of ten miles or more (0.07 — 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		No Federal Standards		
Sulfates	24 Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[8]	24 Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

* The Nitrogen Dioxide ambient air quality standard was amended on February 22, 2007, to lower the 1-hr standard to 0.18 ppm and establish a new annual standard of 0.030 ppm. These changes become effective after regulatory changes are submitted and approved by the Office of Administrative Law, expected later this year.

See footnotes on next page …

Table 3.1 Continued

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

2. National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calender year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For PM2.5, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact U.S. EPA for further clarification and current federal policies.

3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

4. Any equivalent procedure which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

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

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

7. Reference method as described by the EPA. An “equivalent method” of measurement may be used but must have a “consistent relationship to the reference method” and must be approved by the EPA.

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

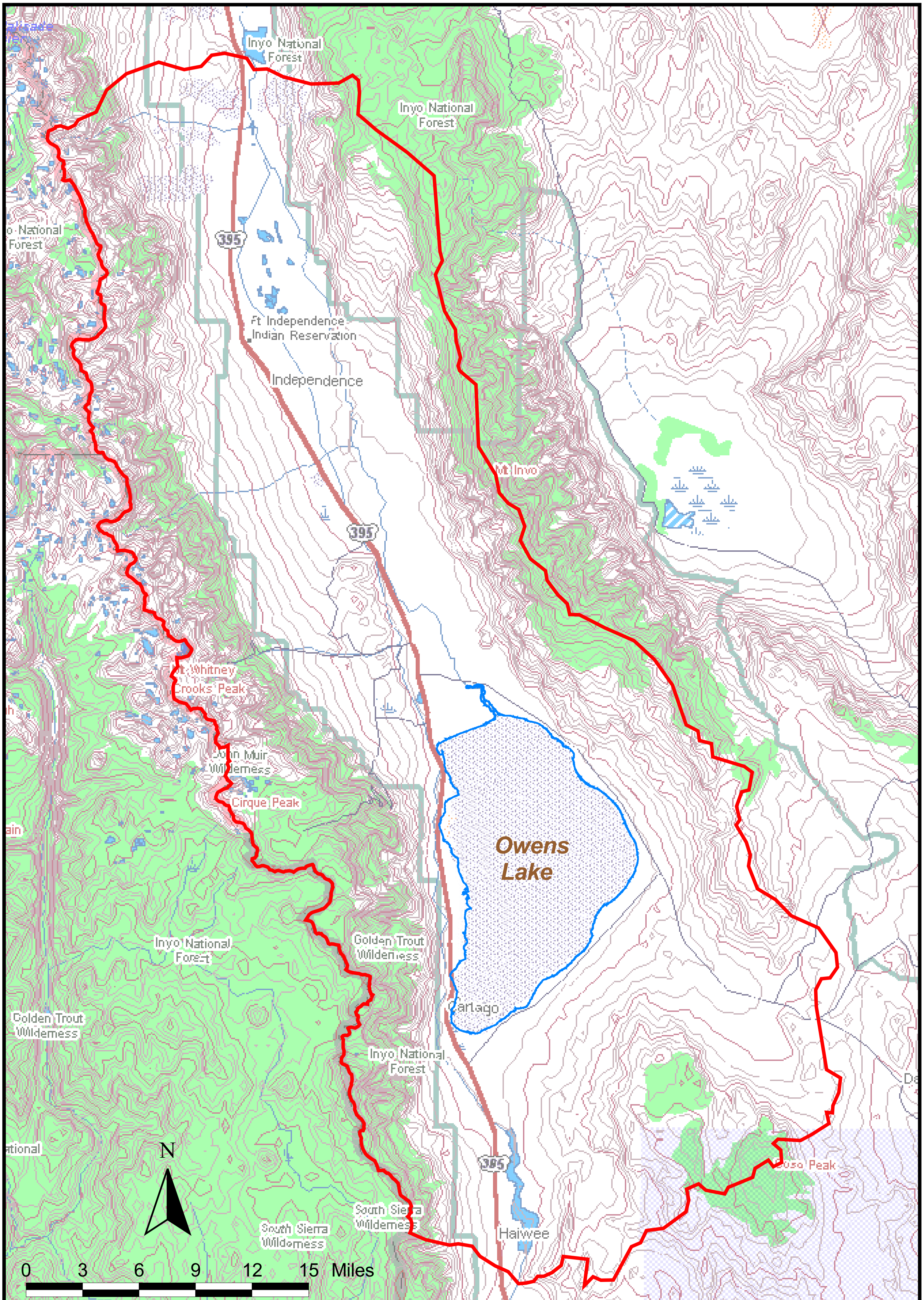

Figure 3.1 - Boundaries of the federal PM-10 nonattainment area

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3-year attainment demonstration period. As a result, the USEPA made the finding that the Owens Valley failed to attain the standard as required under CAAA §189(d).

The USEPA did not take action on the approval or disapproval of the 2003 SIP, but it has been approved by both the District and the state and is currently enforced by the District. By December 31, 2006, the City had implemented dust control measures on all 29.8 square miles of the lake bed as required in the 2003 SIP.

This 2008 SIP revises the 2003 SIP and includes an updated analysis of the particulate matter air pollution problem in the Owens Valley and a revised control strategy to bring the area into attainment with the federal air quality standard for particulate matter as soon as practicable. This 2008 SIP also incorporates provisions of the Settlement Agreement between the District and the City to expand dust control measures to additional areas at Owens Lake in order to attain the NAAQS as soon as practicable (GBUAPCD, 2006b).

3.3 PM_{10} AIR QUALITY

3.3.1 Health Impacts of PM_{10}

Particulate pollution is generally associated with dust, smoke and haze and can be measured as PM_{10}, which indicates particulate matter less than 10 microns in average aerodynamic diameter. These particles are extremely small, one-seventh the diameter of a human hair or 400 times smaller than the period at the end of this sentence. Because of their small size, the particles can easily penetrate into the lungs. Breathing PM_{10} can cause a variety of health problems. It can increase the number and severity of asthma and bronchitis attacks. It can cause breathing difficulties in people with heart or lung disease, and it can increase the risk for, or complicate, existing respiratory infections. Children, the elderly and people with existing heart and lung problems are especially sensitive to elevated levels of PM_{10}. Even healthy people can be adversely affected by dust at extremely high concentrations. The USEPA has set an episode level of 600 $\mu g/m^3$ (averaged over 24 hours) as the level that can pose a significant risk of harm to the health of the general public (40 CFR 51.151).

3.3.2 Owens Lake Health Advisory Program

The NAAQS for PM_{10} is frequently violated in the Owens Valley Planning Area because of wind-blown dust from Owens Lake. Wind speeds greater than about 17 mph have the potential to cause significant wind erosion from the barren lake bed. Ambient PM_{10} readings are the highest measured in the country (USEPA, 2007a). Prior to implementing dust control measures on the lake bed, twenty-four-hour average PM_{10} concentrations measured at the Dirty Socks monitor site at times exceeded 12,000 $\mu g/m^3$—more than 80 times higher than the 24-hour NAAQS of 150 $\mu g/m^3$.

In 1995, the District instituted a program to advise the public when unhealthful levels of particulate pollution occur in the Owens Valley area. Under this program, the District issues Air Pollution Health Advisories when dust storms from Owens Lake cause PM_{10} concentrations that exceed selected trigger levels. Health Advisory notices are faxed to schools and doctor’s offices in the area and to local news media.

- Stage 1 Air Pollution Health Advisories are issued when hourly PM_{10} levels exceed 400 µg/m^3. The Stage 1 Health Advisory recommends children, the elderly, and people with heart or lung problems refrain from strenuous outdoor activities in dust-impacted areas.
- Stage 2 Air Pollution Health Advisories are issued when hourly PM_{10} levels exceed 800 µg/m^3, and recommends that everyone refrain from strenuous outdoor activities in dust-impacted areas.

From fall of 1995 through spring of 2007, over 150 advisories were issued as part of the Owens Lake Air Pollution Health Advisory program. This program is not intended to replace the need to control the dust problem at Owens Lake, but is intended to help reduce adverse health effects until dust control measures are in place. The health advisory program will remain in effect until dust control measures are fully implemented at Owens Lake and PM_{10} levels no longer violate the NAAQS.

3.3.3 Monitoring Sites and Data Collection

3.3.3.1 PM_{10} Monitoring Network

Ambient PM_{10} measurements to determine compliance with the federal PM_{10} standard have been taken at Keeler, Olancha and Lone Pine for over 20 years (Figure 3.2). Meteorological data are also collected at each of these permanent monitoring sites to provide wind speed, wind direction, and temperature information. An upper air profiler was operated from March to May 2000 and January to September 2001 at Dirty Socks and from October 2001 to June 2003 at the Mill Site to measure upper level wind speeds and temperature profiles. Precipitation data are collected at the Keeler site and humidity and barometric pressure are recorded at the Olancha site. Four additional PM_{10} sites were set up on the shoreline of Owens Lake as part of the Owens Lake Dust Identification Program. These are Dirty Socks (Summer 1999), Shell Cut and Flat Rock (both set up in January 2001) and the Bill Stanley site (March 2002). Other sites that were or still are monitored for PM_{10} from Owens Lake include the Navy 1 site at the Coso Known Geothermal Resource Area and the Coso Junction site. These sites are about 10 miles south of the Owens Valley planning area. The Coso Junction PM_{10} monitor is currently providing hourly PM_{10} measurements and the Navy 1 monitor was discontinued in 1998.

The Lone Pine Paiute-Shoshone Tribe installed a PM_{10} monitor on the Lone Pine reservation in 2002 and a $PM_{2.5}$ monitor in 2006. Both monitors are Tapered Element Oscillating Microbalance (TEOM) monitors that provide hourly concentration data. They are operated in accordance with federal monitoring guidelines (40 CFR, Part 58). The monitor site is located southeast of the District's Lone Pine monitor site. Data from the Lone Pine Tribe's PM_{10} TEOM have closely paralleled the values recorded by the District's Lone Pine TEOM, although specific dust plumes may cause high values at one of these TEOMs and yet miss the other.

Currently, all the PM_{10} monitor sites in the planning area are equipped with TEOM continuous PM_{10} samplers (*EPA Manual Reference Method:* EQPM-1090-079) that provide hourly and daily PM_{10} concentrations. TEOMs are USEPA equivalent method particulate monitors. Some of the monitoring sites began collecting PM_{10} data with High-Volume (Hi-Vol) samplers (Wedding [RFPS-1087-062] or Graseby [RFPS-1287-063]). Changes in primary sampler type, from Hi-Vols to TEOMs, are indicated in Table 3.2. All Owens Lake monitoring sites, except the Bill Stanley site were also equipped with Partisol PM_{10} samplers (RFPS-1298-126 and RFPS-1298-127), which are filter-based USEPA-approved reference method samplers that were operated to

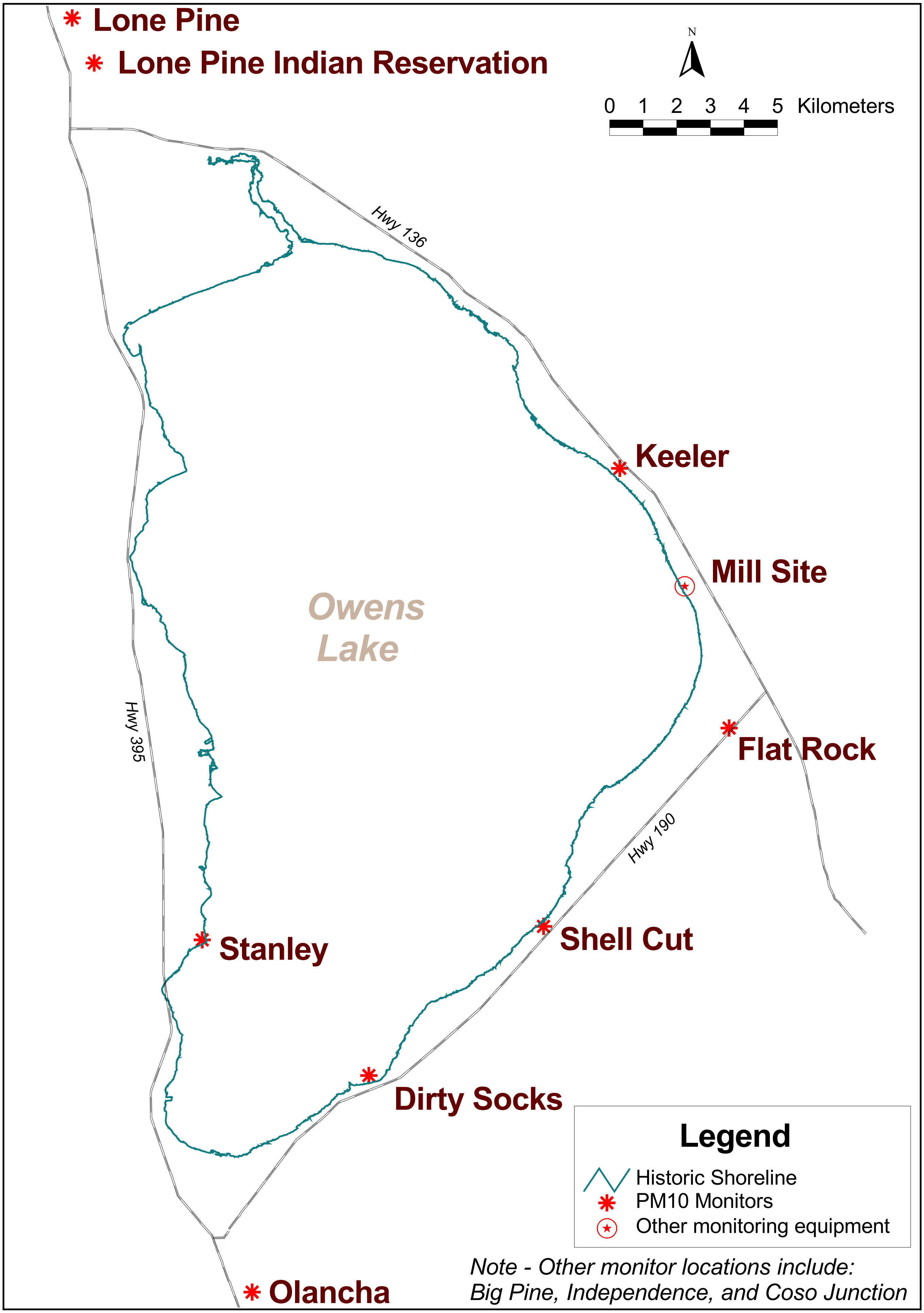

Figure 3.2 - Location of PM-10 monitor sites near Owens Lake

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provide 24-hour average PM_{10} concentrations. The Partisol samplers confirm the 24-hour averages of the TEOM samplers (Parker, 2003). Table 3.2 summarizes the particulate matter monitoring history at each site in the Planning Area.

The District performed a detailed study of different types of PM_{10} monitors and found significant differences in the concentrations measured by collocated monitors of different types. The District's analysis showed that TEOM and Partisol samplers provide the most consistent measurements at Owens Lake, and that they are the most suitable monitors for measuring PM_{10} caused by wind-blown dust (Ono, *et al*., 2000).

3.3.3.2 Dust Transport Study

Historically, the permanent PM_{10} monitoring stations were operated on a one-in-six day schedule to sample PM_{10}, and did not sample on the other five off-schedule days. This was changed for a period from March 1993 to June 1995 to collect data to assess the PM_{10} impacts downwind from Owens Lake toward the City of Ridgecrest. A special-purpose monitoring network was set up adding the southern communities of Pearsonville, Inyokern and Ridgecrest. During the special-purpose monitoring period, samplers at both Owens Lake and the southern sites were operated on days when Owens Lake dust events were forecast to have impacts toward the south. The results of this study showed that Owens Lake dust plumes caused exceedances of the PM_{10} NAAQS as far as Ridgecrest, 60 miles south of the lake. The 1998 SIP (GBUAPCD, 1998a) includes the monitoring data from this episode-monitoring program.

About 40,000 permanent residents from Ridgecrest to Bishop are affected by the dust from Owens Lake. In addition, many visitors spend time in this dust-impacted area, to enjoy the many recreational opportunities the Eastern Sierra and high desert have to offer. Lone Pine annually hosts the Lone Pine film festival, which draws thousands of visitors from outside the area. The National Park Service is concerned about the health hazard posed to the 86,000 people that annually visit the Manzanar National Historic Site, 15 miles north of Owens Lake. The Park Service is concerned because a high percentage of the visitors to Manzanar are older visitors who are more prone to airborne respiratory threats, and that they will spend 3 to 4 hours outdoors in a potentially harmful environment (Hopkins, 1997).

3.3.3.3 $PM_{2.5}$ Monitoring at Keeler

Monitoring of fine particulate matter ($PM_{2.5}$) on a 1-in-3-day schedule was initiated in 1999 at Keeler. Eight years of $PM_{2.5}$ data show a rough correspondence between $PM_{2.5}$ levels and PM_{10} levels at the Keeler site. A high value of 193 $\mu g/m^3$, recorded on December 28, 2006, indicates that a serious fine particulate pollution problem may exist at this site. However, the current $PM_{2.5}$ NAAQS is 35 $\mu g/m^3$ for the 98^{th} percentile value at a monitor in a calendar year. This allows seven exceedances of the 35 $\mu g/m^3$ standard per year without violating the standard. Therefore, there was not a violation of the $PM_{2.5}$ NAAQS at Keeler for 2006 because the 98^{th} percentile (eighth highest) value was below 35 $\mu g/m^3$, despite this one high value. To date, no violations of the $PM_{2.5}$ NAAQS have been documented in Keeler.

In the near future, the District is planning to upgrade to daily $PM_{2.5}$ monitoring at Keeler in an effort to better characterize fine particulate levels there.

3.3.4 PM_{10} Data Summary

3.3.4.1 Number of 24-hour Exceedances

From 1993 through 2006, almost daily PM_{10} sampling recorded 208 PM_{10} exceedances at Keeler. This averages about 15 exceedances of the PM_{10} NAAQS per year. The Dirty Socks monitor recorded 205 PM_{10} exceedance days over a seven year period from January 2000 to December 2006. Dirty Socks averaged over 29 exceedances per year and had the highest concentrations of the seven sites monitored. Figure 3.3 shows the number of exceedances from 1994 through 2006 at each site. All six monitor sites were in violation of the 24-hour average PM_{10} NAAQS, which allows no more than one exceedance per year over a three year period.

3.3.4.2 Annual Average PM_{10} Concentrations

Figure 3.4 shows the annual PM_{10} concentration trend for six Owens Lake sites from 1994 through 2002. Although the USEPA eliminated an annual PM_{10} NAAQS in 2006, it is instructive to track annual PM_{10} averages in order to observe trends (Prior to its elimination, the annual PM_{10} NAAQS was 50 $\mu g/m^3$). Since the installation of a PM_{10} monitor at Dirty Socks in 1999, this monitor site has consistently registered the highest concentrations measured at Owens Lake. The three-year annual average for Dirty Socks was estimated at 157 $\mu g/m^3$ for the years 2000-2002. Only once (2005) in seven years of operation has the annual average PM_{10} concentration in Dirty Socks monitoring site dropped below 50 $\mu g/m^3$. The Shell Cut monitoring site has produced an annual average above 50 $\mu g/m^3$ for the years 2002 through 2006, as well.

3.3.4.3 Peak PM_{10} Concentrations

The 24-hour average PM_{10} measurements from Owens Lake sites are consistently listed as the highest concentrations in the United States on the USEPA's AIRData website (USEPA, 2007c). PM_{10} concentrations exceeding 20,000 $\mu g/m^3$ have been measured at the Dirty Socks monitor site using a partisol PM_{10} monitor. This is more than 133 times higher than the 24-hour NAAQS of 150 $\mu g/m^3$. Partisols are Federal Reference Method monitors that collect samples on a filter that are weighed in the lab and are operated once every third day. However, note that most of the PM_{10} data shown in Table 3.2 are based on automated TEOM PM_{10} measurements which provide hourly and daily concentrations and are another federally approved PM_{10} monitor. Table 3.3 compares Owens Lake values with the rest of the United States.

In the data available on the USEPA's AIRData website, Owens Lake has produced the highest PM_{10} reading in the nation in all but one of the past eleven years. As shown graphically in Figure 3.5, Owens Lake concentrations have consistently dwarfed values reported from the rest of the nation since 2000. Table 3.3 also contains PM_{10} values measured at Mono Lake, which is in the District to the north of the Owens Valley PM_{10} Planning Area. Mono Lake has also consistently exceeded all PM_{10} readings in the rest of the nation since 2000. Mono Lake PM_{10} exceedances are also caused by the City of Los Angeles' Eastern Sierra water diversions (GBUAPCD, 1995).

The highest PM_{10} concentration for any of the PM_{10} monitor sites at Owens Lake on each date for a six-year period is shown in Figure 3.6. PM_{10} concentrations are shown on a logarithmic scale due to the extreme concentration range. The seasonal nature of the dust events can also be seen in this figure. Most dust events occur during winter and spring. There are few violations recorded during summer and fall months.

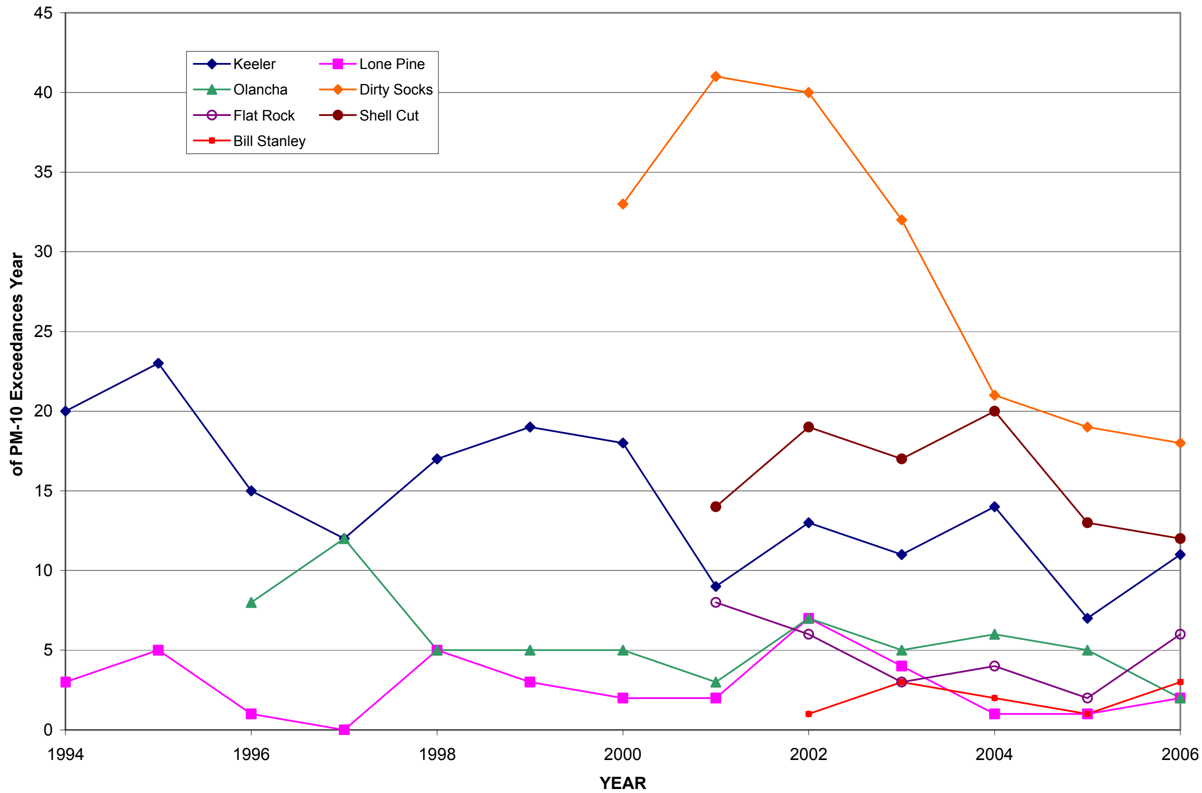

Figure 3.3 - All seven Owens Lake monitoring sites have violated the NAAQS (150 µg/m^3) by averaging more than one exceedance per year of the 24-hour standard.

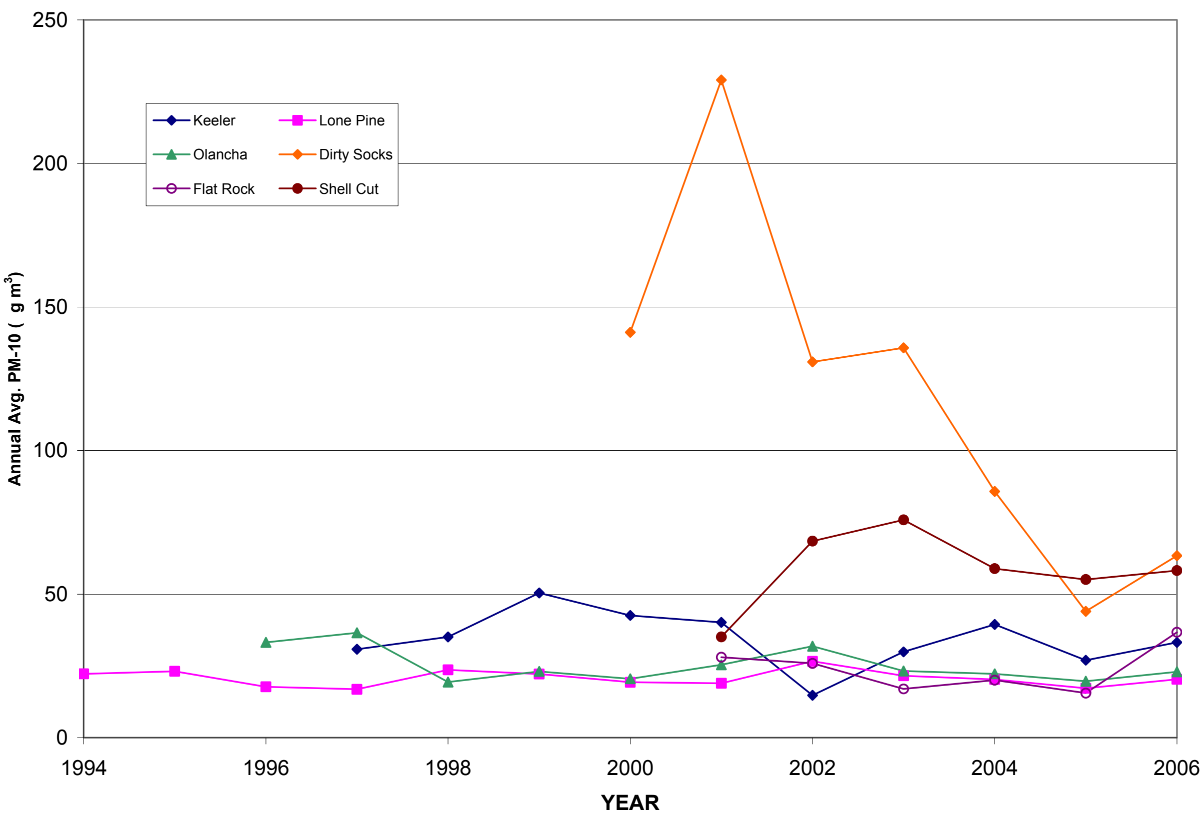

Figure 3.4 - The 3-year annual average PM_{10} concentrattions measured at Dirty Socks and Shell Cut both violated the PM_{10} annual NAAQS of 50 µg/m^3.

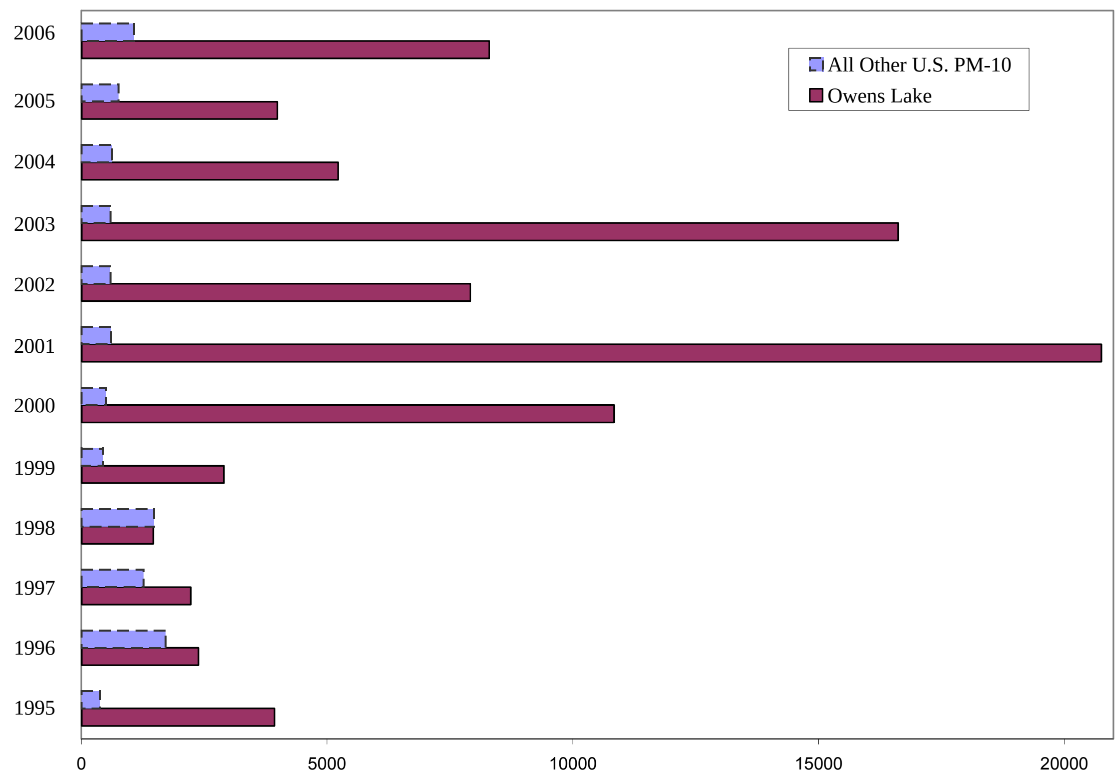

Figure 3.5 - Yearly comparison of highest Owens Lake PM_{10} concentrations with highest concentrations at all U.S. PM_{10} monitoring sites outside the GBUAPCD

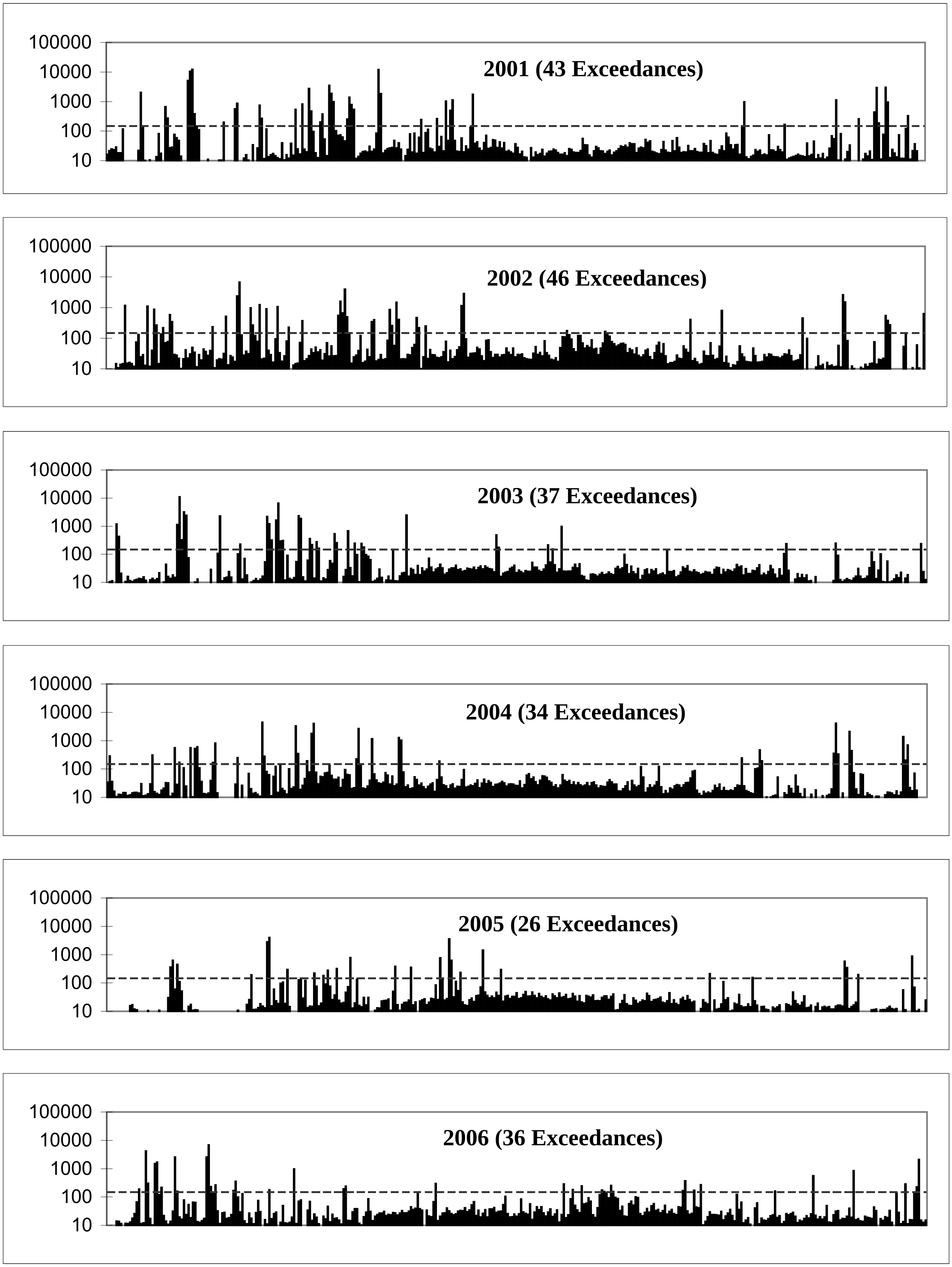

Figure 3.6 - Daily 24-hour maximum PM-10 values at Owens Lake monitoring sites, 2001 - 2006

Table 3.2 Summary of the particulate matter monitoring history for each site

Site	Year	Peak 24-Hour Value	Number of Exceeds	Adjusted # of Exceeds	Annual Average	3-Year Average	Number Sample Days	Primary Monitor
KEELER	1987	672	4	24	46.70		60	Hi Vol
KEELER	1988	394	2	12	31.75		58	Hi Vol
KEELER	1989	1861	4		**Invalid**		55	Hi Vol
KEELER	1990	858	2		**Invalid**		20	Hi Vol
KEELER	1991	181	1		**Invalid**		47	Hi Vol
KEELER	1992	526	3	18	37.34		59	Hi Vol
KEELER	1993	781	1	6	43.16		58	Hi Vol
KEELER	1994	1381	20		**Invalid**		297	TEOM
KEELER	1995	3929	23		**Invalid**		311	TEOM
KEELER	1996	862	15	15	**Invalid**		309	TEOM
KEELER	1997	835	12	12	30.81		341	TEOM
KEELER	1998	1464	17	17	35.08		353	TEOM
KEELER	1999	2569	19	19	50.41	38.76	364	TEOM
KEELER	2000	1101	18	18	42.56	42.68	365	TEOM
KEELER	2001	1400	9	9	40.16	44.38	353	TEOM
KEELER	2002	1077	13	13	14.75	39.86	365	TEOM
KEELER	2003	1209	11	11	29.87	35.63	364	TEOM
KEELER	2004	3322	14	14	39.46	35.40	363	TEOM
KEELER	2005	1441	7	7	26.99	32.11	364	TEOM
KEELER	2006	2101	11	11	33.18	33.21	365	TEOM
LONE PINE	1987	178	1	6	23.27		58	Hi Vol
LONE PINE	1988	172	1	6	21.60		60	Hi Vol
LONE PINE	1989	126	0	0	22.73	22.53	61	Hi Vol
LONE PINE	1990	68	0	0	17.15	20.49	61	Hi Vol
LONE PINE	1991	82	0	0	17.90	19.26	59	Hi Vol
LONE PINE	1992	63	0	0	17.15	17.40	57	Hi Vol
LONE PINE	1993	170	1	5	17.02	17.36	117	Hi Vol
LONE PINE	1994	499	3	3	22.23	18.80	352	TEOM
LONE PINE	1995	392	5	5	23.12	20.79	363	TEOM
LONE PINE	1996	166	1	1	17.71	21.02	336	TEOM
LONE PINE	1997	123	0	0	16.86	19.23	360	TEOM
LONE PINE	1998	472	5	5	23.62	19.40	346	TEOM
LONE PINE	1999	325	3	3	22.18	20.89	350	TEOM
LONE PINE	2000	180	2	2	19.30	21.70	360	TEOM
LONE PINE	2001	260	2		18.94	20.14	332	TEOM
LONE PINE	2002	315	7	7	26.59	21.61	365	TEOM
LONE PINE	2003	724	4	4	21.57	22.37	365	TEOM
LONE PINE	2004	349	1	1	20.27	22.81	355	TEOM
LONE PINE	2005	262	1	1	17.20	19.68	364	TEOM
LONE PINE	2006	293	2	2	20.33	19.26	361	TEOM

Table 3.2 Continued

Site	Year	Peak 24-Hour Value	Number of Exceeds	Adjusted # of Exceeds	Annual Average	3-Year Average	Number Sample Days	Primary Monitor
OLANCHA	1987	31	0		**Invalid**		31	Hi Vol
OLANCHA	1988	55	0	0	19.00		57	Hi Vol
OLANCHA	1989	109	0		**Invalid**		52	Hi Vol
OLANCHA	1990	200	2	12	23.19		61	Hi Vol
OLANCHA	1991	181	1	6	18.04		59	Hi Vol
OLANCHA	1992	366	2	6	19.66	20.30	60	Hi Vol
OLANCHA	1993	346	3		**Invalid**		36	Hi Vol
OLANCHA	1994	362	2		**Invalid**		94	Hi Vol
OLANCHA	1995	2252	4		**Invalid**		207	TEOM
OLANCHA	1996	2383	8	8	33.22		354	TEOM
OLANCHA	1997	2229	12	12	36.52		350	TEOM
OLANCHA	1998	327	5	5	19.38	29.71	358	TEOM
OLANCHA	1999	353	5	5	23.07	26.32	356	TEOM
OLANCHA	2000	417	5	5	20.54	21.00	365	TEOM
OLANCHA	2001	1545	3	3	25.37	22.99	352	TEOM
OLANCHA	2002	905	7	7	31.86	25.92	365	TEOM
OLANCHA	2003	1062	5	5	23.23	26.82	359	TEOM
OLANCHA	2004	408	6	6	22.24	25.78	365	TEOM
OLANCHA	2005	288	5	5	19.64	21.71	363	TEOM
OLANCHA	2006	428	2	2	22.94	21.61	364	TEOM
DIRTY SOCKS	1999	2182	10		**Invalid**		185	TEOM
DIRTY SOCKS	2000	10549	33	33	141.21		365	TEOM
DIRTY SOCKS	2001	12153	41	41	229.11		339	TEOM
DIRTY SOCKS	2002	6702	40	40	130.90	167.07	365	TEOM
DIRTY SOCKS	2003	10933	32	32	135.77	165.26	365	TEOM
DIRTY SOCKS	2004	4472	21	21	85.77	117.48	365	TEOM
DIRTY SOCKS	2005	3087	19	19	43.99	88.51	365	TEOM
DIRTY SOCKS	2006	4169	18	18	63.39	64.38	364	TEOM
FLAT ROCK	2001	1779	8	8	28.00		354	TEOM
FLAT ROCK	2002	759	6	6	25.89		359	TEOM
FLAT ROCK	2003	395	3	3	16.98	23.62	363	TEOM
FLAT ROCK	2004	626	4	4	20.04	20.97	348	TEOM
FLAT ROCK	2005	346	2	2	15.52	17.51	365	TEOM
FLAT ROCK	2006	6171	6	6	36.73	24.10	364	TEOM
SHELL CUT	2001	2660	14	14	35.08		351	TEOM
SHELL CUT	2002	2840	19	19	68.44		361	TEOM
SHELL CUT	2003	9162	17	17	75.87	59.80	342	TEOM
SHELL CUT	2004	2990	20	20	58.89	67.73	366	TEOM
SHELL CUT	2005	3989	13	13	55.08	63.28	359	TEOM
SHELL CUT	2006	6847	12	12	58.20	57.39	365	TEOM

Table 3.2 Continued

Site	Year	Peak 24-Hour Value	Number of Exceeds	Adjusted # of Exceeds	Annual Average	3-Year Average	Number Sample Days	Primary Monitor
COSO JUNCTION	1987	196	1	6	33.53		59	Hi Vol
COSO JUNCTION	1988	92	0	0	33.53		59	Hi Vol
COSO JUNCTION	1989	227	1	6	27.13	27.43	61	Hi Vol
COSO JUNCTION	1990	866	1	6	29.38	26.05	60	Hi Vol
COSO JUNCTION	1991	93	0	0	18.80	25.10	60	Hi Vol
COSO JUNCTION	1992	38	0		**Invalid**		36	Hi Vol
COSO JUNCTION	1993	254	2		**Invalid**		51	Hi Vol
COSO JUNCTION	1994	388	1		**Invalid**		49	Hi Vol
COSO JUNCTION	1995	692	2	12	18.60		55	Hi Vol
COSO JUNCTION	1996	309	1		**Invalid**		47	Hi Vol
COSO JUNCTION	1997	92	0		**Invalid**		54	Hi Vol
COSO JUNCTION	1998	409	1	6	22.81		59	Hi Vol
COSO JUNCTION	1999	46	0	0	13.96		114	Hi Vol
COSO JUNCTION	2000	74	0	0	14.56	17.11	110	Hi Vol
COSO JUNCTION	2001	100	0	0	11.42	13.31	122	Hi Vol
COSO JUNCTION	2002	175	1	3	17.63	14.53	112	Hi Vol
COSO JUNCTION	2003	484	1	3	20.10	16.38	110	Hi Vol
COSO JUNCTION	2004	66	0	0	14.40	17.37	121	Hi Vol
COSO JUNCTION	2005	97	0	0	17.89	17.46	119	Hi Vol
COSO JUNCTION	2006	296	1	1	19.09	17.12	273	TEOM
BILL STANLEY	2002	539	1		**Invalid**		154	TEOM
BILL STANLEY	2003	2196	3		**Invalid**		92	TEOM
BILL STANLEY	2004	191	2		**Invalid**		166	TEOM
BILL STANLEY	2005	880	1		**Invalid**		261	TEOM
BILL STANLEY	2006	322	3	3	17.69		356	TEOM

Notes:
(1) Number of samples 150 µg/m^{3} or more.
(2) If not daily sampling, number of exceeds is divided by sampling frequency (e.g., divide by 1/6 for 1-in-six-day sampling).
(3) Annual average is invalid if less than 75% of scheduled samples are collected in each of four quarters.
(4) One quarter (3rd) at 73% data capture. District views data as valid.

Table 3.3 – Annual Ranking of Owens Lake PM_{10} in U.S.

YEAR	Owens Lake Highest in U.S.?	Highest Owens Lake Value	Highest Mono Lake Value	Highest non-GBUAPCD Value
1995	Yes	3,929	-	384
1996	Yes	2,383	-	1,715
1997	Yes	2,229	-	1,264
1998	No	1,464	-	1,477
1999	Yes	2,901	-	442
2000	Yes	10,842	10,466	508
2001	Yes	20,754	4,482	610
2002	Yes	7,915	6,505	590
2003	Yes	16,619	5,745	590
2004	Yes	5,225	987	625
2005	Yes	3,989	2,108	760
2006	Yes	8,299	4,300	1,079

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For days when the 24-hour PM_{10} standard is violated, peak hourly wind speeds at the Owens Lake monitoring sites have been measured up to 50 mph. However, violations have also been recorded when the hourly wind speed peaked at a more modest 20 mph. The daily average wind speed when the 24-hour PM_{10} standard is violated ranges from 5 to 33 mph, since many violations occur with winds that last only a few hours.

3.3.4.4 PM_{10} Trends

Although dust control measures were in place on 29.8 square miles of lake bed by the end of 2006, PM_{10} levels at Owens Lake have remained high at the monitoring sites. Monitoring of PM_{10} levels beginning in 2007 will be necessary to establish the overall air quality improvements resulting from the first phases of dust control measure implementation. Some improvement in exceedances per year (Figure 3.3) and in annual average PM_{10} concentration (Figure 3.4) at Keeler and Dirty Socks may indicate signs of improvement, but are yet to show that the NAAQS are being met. At Keeler, the average TEOM value for the years 1993 through 2000 was 45 $\mu g/m^3$. This was prior to the construction of dust control measures on the nearby North Sand Sheet. The average TEOM value for the years 2002 through 2006, after dust control measures on the North Sand Sheet were operational, was 34 $\mu g/m^3$. The inter-year comparisons in Figure 3.6 indicate an overall reduction in exceedances per year and a reduction in daily peak values at Owens Lake monitors. Keeler and Dirty Socks appear to be trending toward significant reductions in PM_{10} levels, but the other sites have yet to show significant improvements.

3.4 CANCER RISK DUE TO OWENS LAKE DUST STORMS

In addition to the high levels of fine particulate matter, Owens Lake dust also contains cadmium, arsenic and other toxic metals that are at levels above those in soils in the Owens Valley due to natural concentration in the terminal lake. These metals pose a significant risk for additional cancer cases in the areas of greatest dust impact. Table 3.4 shows that the cancer risk at Keeler, associated with cadmium and arsenic in the Owens Lake dust, is estimated at 23 additional cases in a million. This is based on an annual concentration average of 45 $\mu g/m^3$ from the dust storms, breathed over a 70-year period. The value of 45 $\mu g/m^3$ is taken from the seven-year average of PM_{10} concentrations measured using a TEOM at Keeler (1993-2000). This average represents the annual average prior to the implementation of controls.

Under the District's adopted air toxics policy, a toxic risk greater than one in a million additional cancer cases is considered to be significant. This policy requires implementation of controls on sources that pose a risk greater than one in a million in order to reduce the risk, and it prohibits the issuance of a permit to sources that exceed a risk of 10 in a million (GBUAPCD, 1987). A revised cancer risk from arsenic and cadmium, using the reduced average dust concentration of 34 $\mu g/m^3$ at Keeler, would result in 17 cases per million, a significant reduction in cancer risk. Model calculations project an average Keeler PM_{10} concentration of 21 $\mu g/m^3$ after all dust control measures are operational. This would result in even greater reduction in cancer risk. Since this residual dust would contain a smaller fraction of lake bed-derived material than under pre-dust-control conditions, the benefits for reduction in cancer risk would be compounded.

Table 3.4 Inhalation cancer risk at Keeler due to Owens Lake dust storms

Toxic Metal	Cancer Potency $(\mu g/m^3)^{-1}$	Toxic Metal Concentration (parts per million)	Inhalation Cancer Risk
Cadmium	4.2×10^{-3}	29	5 per million
Arsenic	3.3×10^{-3}	118	18 per million

Lifetime Cancer Risk =23 per million

- *Cancer potency from the Air Toxics Hot Spots Program (OEHHA, 2002).*
- *Dust samples are taken from Keeler PM_{10} filters, with concentrations measured by x-ray fluorescence (Chester LabNet, 1996).*
- *70-year cancer risk at PM_{10} = 45 $\mu g/m^3$ (Keeler annual average from 1993-2000).*

3.5 VISIBILITY AND SENSITIVE AIRSHEDS

Under normal conditions, visibility in the Owens Valley generally ranges from 37 to 93 miles, with the best visibility occurring during winter. Visibility is most limited from May through September and during days when Owens Lake dust storms occur. Owens Lake dust storms can reduce visibility to near zero at Owens Lake and obscure visibility 150 miles away from the lake bed. The main cause of visibility degradation in the Owens Valley is fine particles in the atmosphere. In addition to dust from Owens Lake, visibility degradation results from transport of air pollutants from the San Joaquin Valley and South Coast air basins, and from forest fires. Most of the visibility degradation can be attributed to inter-basin transport of air pollutants. On days when Owens Lake dust storms do not occur, emissions of fine particulate matter from gasoline and diesel fueled vehicles and equipment within the Owens Valley are local man-made contributors to visibility degradation. However, these local sources have an insignificant impact on the area's visibility. Nitrogen dioxide, a light-absorbing gas formed during local fuel combustion, contributes less than five percent to the overall visibility degradation. Other local man-made sources of visibility degrading emissions represent less than five percent of the overall reduction in visibility (Trijonis, *et al*., 1988).

There are 11 sensitive airsheds in the region, including wilderness areas, national parks, national forests, a national historic site, and the R-2508 military airspace. Figure 3.7 shows the locations of these sensitive airsheds. Four of these airsheds are designated as Class I PSD (Prevention of Significant Deterioration) areas, which are afforded more stringent protection from visibility degradation and for impacts from air pollutants: John Muir and Domeland Wilderness Areas, Kings Canyon and Sequoia National Parks. These sensitive areas and their classifications are shown in Table 3.5.

The R-2508 military air space, which includes the China Lake Naval Air Weapons Station, is a sensitive site for visibility impacts from Owens Lake dust events. Good visibility is needed for some military operations, such as an air-to-air test (an air-launched target whose target is also in

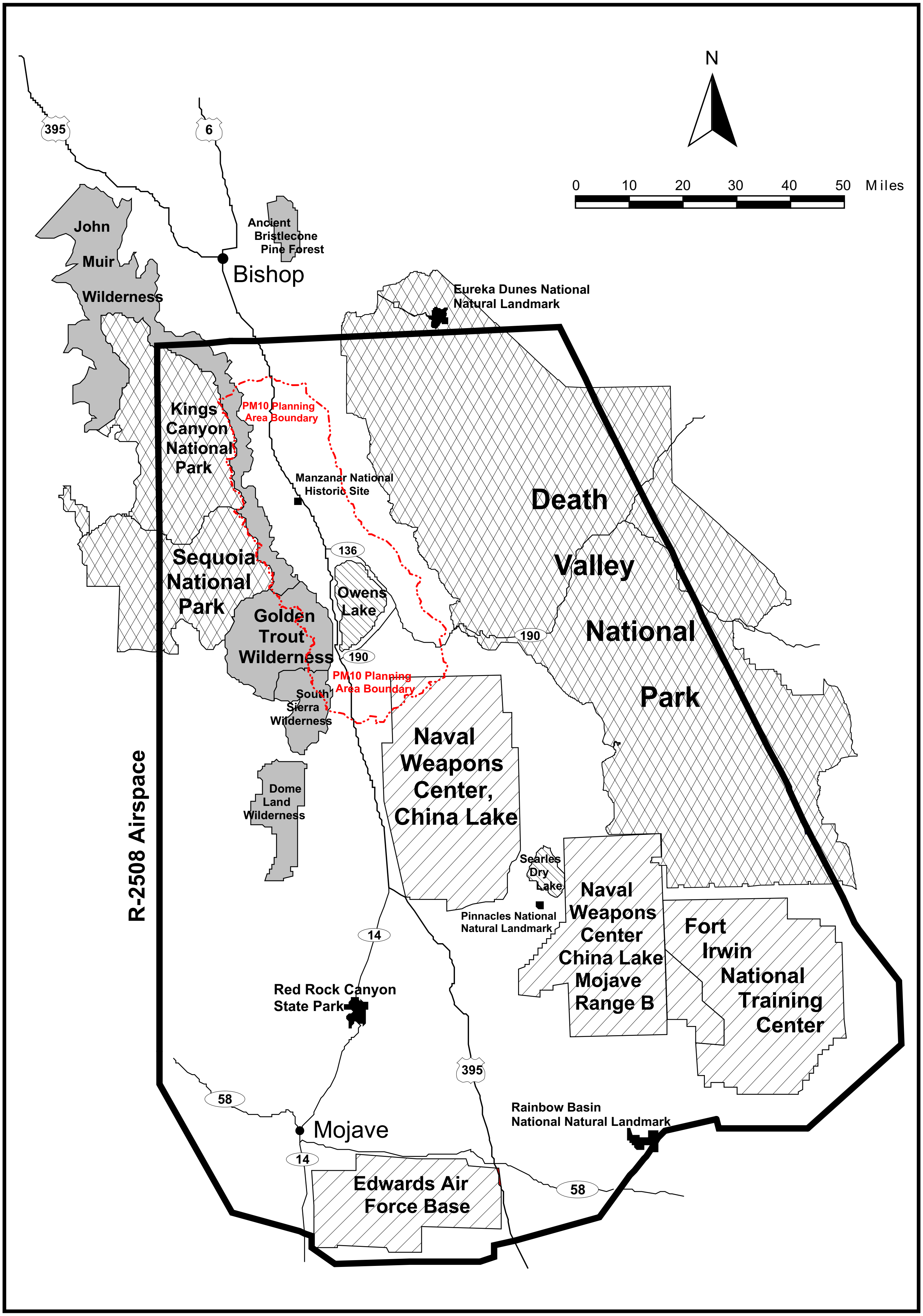

Figure 3.7 - Locations of sensitive airsheds near the Owens Valley Planning Area

Table 3.5 – Sensitive airsheds and their PSD classifications.

Sensitive Airshed	PSD Airshed Classification
Wilderness Areas in National Forests:	
Domeland	Class I
Golden Trout	Class II
John Muir	Class I
South Sierra	Class II
National Parks:	
Death Valley	Class II
Kings Canyon	Class I
Sequoia	Class I
National Historic Site:	
Manzanar	Class II
National Forests:	
Inyo	Class I&II
Sequoia	Class I&II
Military Base:	
China Lake NAWS	Class II

Source: MHA Environmental Consulting, Inc., 1994.

the air), which relies on high-speed cameras to record time and position information. Owens Lake events can reduce the visibility to less than one to two miles at China Lake. The Department of the Navy has stated that cancellation of a test costs the Range and/or its customer approximately $10,000 to $50,000. Owens Lake dust events can lead to cancellations of several tests per day and can last for one to two days, or occasionally longer (Stevenson, 1996).

3.6 OFF-LAKE PM_{10} VIOLATIONS

Analysis of exceedances of the PM_{10} NAAQS at Owens Lake shoreline monitors indicates that some of the high PM_{10} days would have resulted in exceedances, even if emissions from the lake bed were reduced to zero (Kiddoo, *et al.*, 2007). Winds from off-lake directions carry wind-blown dust from the Keeler dunes, northeast of the lake bed, and from the Olancha dunes, south of the lake bed, toward shoreline monitors. In the period from January 2000 through December 2006, the Keeler dunes are estimated to have caused five violations of the PM_{10} NAAQS at Keeler per year. In the same period, the Olancha dunes are estimated to have caused one violation of the PM_{10} NAAQS per year at each of the Shell Cut and Flat Rock monitors. At the Dirty Socks monitor, 30 violations can be attributed to southerly wind directions, but it appears that many of these violations may have resulted from erosion of emissive areas on the lake bed, but south of the Dirty Socks monitor. Dust controls in this area immediately south of the Dirty Socks monitor were completed at the end of 2006, and it is expected that violations there due to southerly wind directions will be reduced to levels similar to those observed at Flat Rock and Shell Cut (see Kiddoo, et al., 2007, for details of this analysis).

After all the lake bed sources in the 2003 and 2008 dust control areas are controlled, the Keeler dunes area is expected to be the only remaining dust source that is causing exceedances of the standard in the planning area. The Olancha dunes are natural dunes that were present prior to the City's water gathering activities in the Owens Valley. If PM_{10} violations are attributed to the Olancha dunes, these violations will be treated as natural events and a Natural Events Action Plan will be developed and implemented in accordance with the USEPA rule on Exceptional Events (see Section 2.2.3.3).

3.7 REFERENCES

Chester LabNet, 1996. Chester LabNet - Portland, report on chemical analysis of ambient filters, Report #95-085, prepared for Great Basin Unified Air Pollution Control District, Tigard, Oregon, June 18, 1996.

Federal Register, 1999. Approval and Promulgation of Implementation Plans: California – Owens Valley Nonattainment Area; PM_{10}, Federal Register, Volume 64, No. 171, pp. 48305-48307, September 3, 1999.

GBUAPCD, 1987. Great Basin Unified Air Pollution Control District, Adopted Toxic Risk Policy, GBUAPCD, Bishop, California, 1987.

GBUAPCD, 1995. Great Basin Unified Air Pollution Control District, Mono Basin Planning Area PM_{10} State Implementation Plan (Final), GBUAPCD, Bishop, California, May, 1995.

GBUAPCD, 1998a. Great Basin Unified Air Pollution Control District, Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan, GBUAPCD, Bishop, California, November 16, 1998.

GBUAPCD, 2003. Great Basin Unified Air Pollution Control District, Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan - 2003 Revision, GBUAPCD, Bishop, California, November 13, 2003.

GBUAPCD, 2006b. Great Basin Unified Air Pollution Control District, Settlement Agreement between the District and the City to resolve the City's challenge to the District's Supplemental Control Requirement determination issued on December 21, 2005 and modified on April 4, 2006, GBUAPCD, Bishop, California, December 4, 2006.

Hopkins, 1997. Hopkins, Ross, letter from National Park Service, Manzanar National Historic Site, Superintendent, to Ellen Hardebeck, Great Basin Unified Air Pollution Control District, regarding the Owens Lake air pollution problem, January 3, 1997.

Kiddoo, *et al.*, 2007. Kidoo, Phill, Jim Parker, Duane Ono, Off-Lake PM_{10} Exceedances at Owens Lake, January 1, 2000 – June 30, 2007.

OEHHA, 2002. Office of Environmental Health Hazard Assessment, Air Toxics Hot Spots Program Risk Assessment Guidelines, Part II, Technical Support Document for Describing Available Cancer Potency Factors, Sacramento, California, December 2002.

Ono, *et al*., 2000. Ono, Duane, Ellen Hardebeck, Jim Parker, B.G. Cox, *Systematic Biases in Measured PM_{10} Values with U.S. Environmental Protection Agency-Approved Samplers at Owens Lake, California,* J.Air & Waste Manage. Assoc., Pittsburgh, PA, 50:1144-1156, July 2000.

Parker, 2003. Parker, James, Comparison of TEOM and Partisol Monitors at Owens Lake, California, Great Basin Unified Air Pollution Control District, June 2003.

Schade, 2005. Great Basin Unified Air Pollution Control District, Owens Lake Dust Control: Air Pollution Control Officer's 2004-2005 Determination Requiring the City of Los Angeles to Implement, Operate and Maintain Air Pollution Control Measures on Additional Areas of the Owens Lake Bed, Letter from Theodore D. Schade, Air Pollution Control Officer, GBUAPCD, Bishop, California to Ronald Deaton, General Manager, Los Angeles Department of Water and Power, Los Angeles, California, December 21, 2005.

Schade, 2006. Great Basin Unified Air Pollution Control District, Modified Determination and Response to the City of Los Angeles' Alternative Analysis of the Air Pollution Control Officer's 2004-2005 Supplemental Control Requirements Determination, Letter from Theodore D. Schade, Air Pollution Control Officer, GBUAPCD, Bishop, California to Ronald Deaton, General Manager, Los Angeles Department of Water and Power, Los Angeles, California, April 2, 2006.

Stevenson, 1996. Stevenson, C.A., letter from U.S. Department of the Navy, Naval Air Weapons Station, Commanding Officer, to Ellen Hardebeck, Great Basin Unified Air Pollution Control District, regarding impact of Owens Lake dust on China Lake, May 9, 1996.

Trijonis, J. *et al.*, 1988. Trijonis, John, Michael McGown, Marc Pitchford, Donald Blumenthal, Paul Roberts, Warren White, Edward Macias, Raymond Weiss, Alan Waggoner, John Watson, Judith Chow, Robert Flocchini, RESOLVE Project Final Report - Visibility Conditions and Causes of Visibility Degradation in the Mojave Desert of California, Naval Weapons Center, China Lake, California, July 1988.

USEPA, 2007a. United States Environmental Protection Agency, Proposed Finding of Failure to Attain; State of California, Owens Valley Nonattainment Area; Particulate Matter of 10 Microns or Less, EPA-R09-OAR-2007-0091, FRL-8291-1, Federal Register, Volume 72, No. 56, March 23, 2007, pp 13723-13726.

USEPA, 2007c. United States Environmental Protection Agency, AirData website, http://www.epa.gov/air/data/monvals.html, August, 2007.

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CHAPTER 4

PM_{10} Emissions Inventory

FIGURES

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4

PM_{10} Emissions Inventory

4.1 INTRODUCTION

Criteria pollutant emissions in the Owens Valley PM_{10} nonattainment area are dominated by PM_{10} emissions from wind erosion on the exposed Owens Lake playa. Other wind erosion sources in the Owens Valley Planning Area include off-lake sources of lake bed dust, small mining facilities and open areas near Lone Pine and Independence that have been disturbed by human activity, including Inyo County's Lone Pine landfill. There is a lack of large industrial sources in the Owens Valley and the only other sources of criteria pollutant emissions are wood stoves, fireplaces, unpaved and paved road dust and vehicle tailpipe emissions. Prescribed burning for wildland management on federal and private lands also generates PM_{10} in and around the nonattainment area. However, prescribed burning is not normally conducted on windy days when Owens Lake dust storms occur. Predicted high wind days are avoided when doing prescribed burns for fire safety reasons.

The emissions inventory includes PM_{10} sources within the expected control area for the plan. This covers the southern half of the designated nonattainment area, which includes the community of Lone Pine on the control area's northern boundary. The future emissions inventory is not expected to grow significantly for population-based sources. Changes to future population and traffic-related emissions are expected to be insignificant in comparison to the wind-blown PM_{10} from Owens Lake. The Inyo County population actually declined 1.6 percent between 1990 and 2006 (from 18,281 to 17,988) (US Census Bureau, 2007).

The annual PM_{10} emissions for the Owens Valley PM_{10} Planning Area are shown in Figure 4.1 for the 2006 emissions inventory base-year. This base-year emissions inventory replaces the 2000 base year inventory that was used for the 2003 SIP. A special effort was made to estimate PM_{10} emissions due to wind erosion from the Owens Lake bed. Except for the off-lake dunes, PM_{10} emissions for other wind erosion areas are not included in the inventory. These dust source areas are usually sporadic and are very small in comparison to dust from the Owens Lake bed. However, along with other area and point sources these emissions are included as a contributor to the background concentration (20 $\mu g/m^3$) in the air quality model.

4.2 NON-OWENS LAKE PM_{10} EMISSIONS

4.2.1 Entrained Paved Road Dust and Vehicle Exhaust Emissions for Mobile Sources

PM_{10} emissions from paved road dust are based on estimates from the California Air Resources Board (CARB) for the 2005 emissions inventory. CARB estimates annual PM_{10} emissions of 336 tons of PM_{10} per year (0.92 tons per day) in Inyo County. PM_{10} emissions from vehicle exhaust were estimated at 0.04 tons per day (T/d) in Inyo County for 2005 (CARB, 2007a).

Assuming that vehicle traffic in the emissions inventory planning area is primarily on Highway US 395, a simple proportion of the mileage in the control area to the length of US 395 in Inyo County yields a good estimate of the PM_{10} 24-hour and annual emissions from mobile sources.

Entrained Road Dust:
(30 miles/115 miles) x 0.92 T/d = 0.24 tons of PM_{10} per day
0.24 T/d x 365 days = 87.6 tons of PM_{10} per year

Vehicle Exhaust:
(30 miles/115 miles) x 0.04 T/d = 0.010 Tons of PM_{10} per day
0.010 T/d x 365 days =3.65 tons of PM_{10} per year

Future emissions can be estimated based on the forecasted change in vehicle miles traveled for Inyo County. The California Department of Transportation forecasts a 15 percent increase in total vehicle miles traveled in Inyo County from 2005 through 2020 (Caltrans, 2005). Assuming that future projections for entrained road dust and vehicle tailpipe emissions will be proportional to the change in vehicle miles traveled, future emissions for these categories are shown below.

Year	Vehicle Mile Traveled Per Year (millions)	Entrained Road Dust (Tons PM_{10}/ year)	Vehicle Exhaust (Tons PM_{10}/Year)
2005	512	87.6	3.65
2010	536	91.7	3.82
2015	568	97.2	4.05
2020	589	100.8	4.20

4.2.2 Entrained Unpaved Road Dust

An estimate of PM_{10} emissions for reentrained road dust from unpaved roads is based on emission factors found in the USEPA's *Compilation of Air Pollutant Emission Factors, AP-42.* Note that this emission factor equation has been revised since the 2003 SIP (USEPA, 2006a).

Equation 4.1

$$E = \frac{k\left(s/12\right)^{a}\left(S/30\right)^{d}}{\left(M/0.5\right)^{c}} - C$$

Where: E = PM_{10} emissions in pound per vehicle mile traveled
s = silt content of road surface material (5 percent)
S = mean vehicle speed (30 miles per hour)
M = surface material moisture content (assume 0.3% from lake bed sand)
C = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear (0.00047 for PM_{10}).

For PM_{10} from public unpaved road: k = 1.8, a = 1, d = 0.5 and c = 0.2

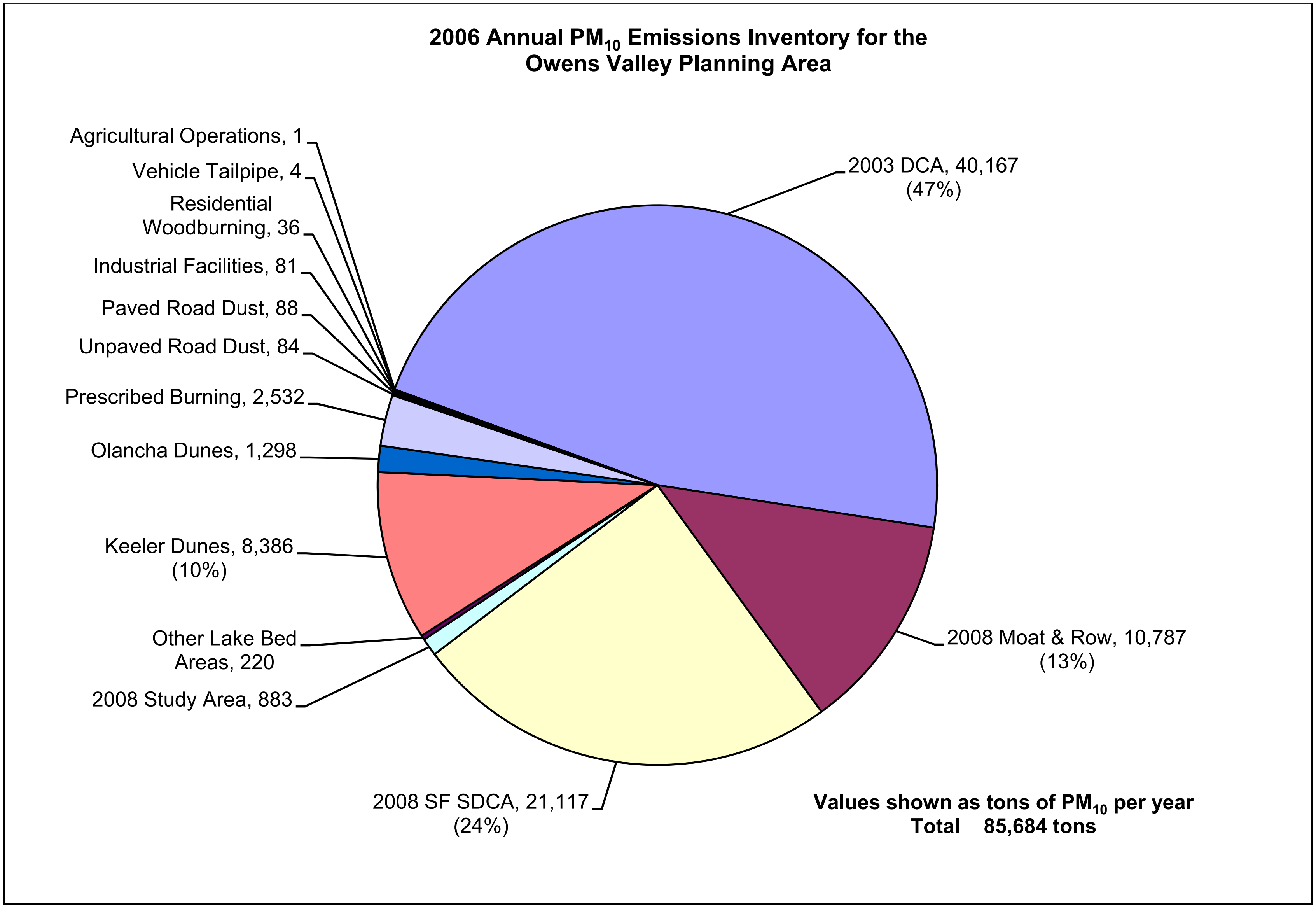

Figure 4.1 – 2006 annual PM_{10} emissions inventory for the Owens Valley Planning Area

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The appropriate values for each variable in the emission estimate are shown above. The 5 percent silt content value is based on samples taken in the Owens Lake area from the Cerro Gordo Road and Keeler, which showed the silt content ranged from 1 to 6 percent (Murphy, 1997).

One emission estimate was made for local residents who travel on unpaved roads near Lone Pine and Owens Lake, and another was done for vehicle traffic associated with Owens Lake bed operations conducted by the Los Angeles Department of Water and Power (City). For local residents, emission estimates are based on the assumption that there may be as many as 50 vehicles per day, with an average trip length of 10 miles. Since the population has been relatively stable in Inyo County, there is no forecasted growth or decline for travel on unpaved roads for future years due to local residents. The estimated population growth in Inyo County from 2000 through 2006 is 0.2 percent as compared to 7.6 percent for California for the same period. (US Census Bureau, 2007) This yields 0.21 tons of PM_{10} per day, or 76 tons of PM_{10} per year.

For operations conducted by the City, there has been a substantial increase in traffic around Owens Lake for the construction and operation of dust control measures on the lake bed and for the Lower Owens River Project. It is assumed that for ongoing maintenance operations that the current level of traffic will decrease and that there may be about 20 vehicles per day with an average trip length of 10 miles on lake bed roads. As part of the Owens Lake dust control program, the City is required to control dust from the roads on a regular basis. The main lake bed roads are graveled and water trucks are used to reduce dust from the unpaved roads. Assuming that watering the unpaved roads raises the average surface moisture content from 0.3 percent to 2 percent, this will reduce estimated emissions by about 75 percent according to estimates based on the methodology in USEPA's AP-42 (USEPA, 2006b). This yields 0.02 tons of PM_{10} per day, or 8 tons of PM_{10} per year from traffic associated with ongoing maintenance of dust control measures at Owens Lake. Combined with travel for local residents the overall PM_{10} emission estimate for unpaved roads is 0.23 tons per day and 84 tons per year.

4.2.3 Residential Wood Combustion

The AP-42 emission factor for wood stoves is 15 grams of PM_{10} per kilogram of wood burned. An estimate of residential wood combustion emissions for the planning area can be made by using the wood usage estimate of 2 cords of pine per year (density = 800 kg/cord) for Bishop, which is 60 miles north of the control area. The heating season is about 150 days per year. The population estimate for the area is 2,745. A high-end estimate for the number of wood stoves is one for every two people (1,372.5 stoves). This yields an estimate of 0.24 tons of PM_{10} per day and 36.3 tons of PM_{10} per year for residential wood combustion in the control area.

Since the population has been relatively stable in Inyo County between 2000 and 2006 (less than 0.2%), there is no forecasted growth or decline for these emission estimates for future years. (US Census Bureau, 2007)

4.2.4 Prescribed Burning Emissions and Regulations

Prescribed burning activities will take place on federal lands for forest management and private lands for rangeland improvement and wildland management purposes. The U.S. Forest Service provided air pollution emission estimates for historic pre-settlement smoke emissions in the Owens Valley PM_{10} nonattainment area (McKee, 1996). The Forest Service plans to increase prescribed burning activities in the national forest to a level that is comparable to historic natural forest fire cycles in the Eastern Sierra. Based on the Forest Service's fuel models and the historic fire return rate to forest land in the Owens Valley PM_{10} nonattainment area, an annual average estimate of 2,532 tons per year of PM_{10} is determined. As the burn season for prescribed burning is expected to last about 60 days per year, daily average emissions will be about 42.2 tons per day.

The inclusion of these emission estimates for prescribed burning is for SIP conformity purposes to ensure that prescribed burning activities in the nonattainment area have been considered in the Owens Valley PM_{10} SIP attainment demonstration. General conformity requirements contained in District Regulation XIII, require that federal actions and federally funded projects conform to SIP rules and that they do not interfere with efforts to attain federal air quality standards.

Prescribed burning activities are not expected to take place on windy days when Owens Lake dust storms might occur. Predicted high wind days are avoided when performing prescription burns for fire safety reasons. In addition, prescribed burning is regulated through District Rules 410 and 411 for wildland and forest management burning. These rules require that a burn plan be submitted to the Air Pollution Control Officer prior to conducting the burn, and that burning will not cause or contribute to violations of the air quality standards. In addition, in 2005 the District entered into an agreement with the Inyo National Forest and the Bureau of Land Management to implement wildland fire smoke management actions that specifically limit the smoke impacts in Eastern Sierra communities (GBUAPCD, 2005). If prescribed burning is done in a manner that complies with District rules, burning activities are not expected to interfere with attainment of the PM_{10} NAAQS in the Owens Valley.

4.2.5 Industrial Facilities

Emissions from industrial facilities are based on permitted emissions under each facility's daily permit limit for throughput or operating hours. Annual emissions are extrapolated from peak daily emissions over a 351-day work year. There are 3 industrial facilities in the planning area near Owens Lake: Big Pine Distributors (21 tons/yr), Pacific Lightweight Product (32 tons/yr) and Federal White Aggregate (28 tons/yr). Total PM_{10} emissions from industrial facilities are 0.23 tons of PM_{10} per day and 81 tons per year.

4.2.6 Agricultural Operations

There are very few agricultural operations near Owens Lake. In the area south of Lone Pine and north of Haiwee reservoir, there are about 200 acres of pastureland and 20 acres of alfalfa. Emissions for agricultural operations are less than 1 ton of PM_{10} per year using estimates provided by the California Air Resources Board. (CARB, 1997 and Keisler, 1997). There is no significant change foreseen for agricultural operations in the planning area.

4.3 LOCATING AND ESTIMATING WIND-BLOWN DUST PM_{10} EMISSSIONS

4.3.1 Dust ID Program Overview

Because wind erosion is the dominant source of PM_{10} in the planning area, a significant effort was made to improve the methods used to estimate emissions and to locate the sources of dust on the lake bed. Traditional methods of estimating emissions such as the use of wind tunnel generated emission estimates and methods described in USEPA's AP-42 were investigated prior to developing the Dust ID method that is discussed in this section. The 1998 Owens Valley SIP used emission algorithms based on wind tunnel tests performed at Owens Lake. PM_{10} emissions were estimated for different seasons as a function of wind speed (Ono, 1997). With the wind tunnel method, the size of the dust producing area was fixed at 35 square miles, and it was assumed that dust would be produced whenever winds were greater than 17 miles per hour. Although these assumptions were adequate for modeling the largest dust events, smaller events were overestimated due to smaller erosion areas, and variable threshold wind speeds. The U.S. EPA suggests another approach to estimate PM_{10} due to wind erosion using methods contained in AP-42 (USEPA, 2006b). The AP-42 approach also has the same shortfalls as the wind tunnel method since it assumes a fixed threshold wind speed for a fixed area size. Ono, *et al*. (2003b) compared the daily emission estimates using AP-42 to those generated using the Dust ID method and found that the AP-42 method often predicted significant emissions when no erosion activity was detected at Owens Lake, and significantly underestimated emissions for the largest dust events. A new method was needed that could account for the changing threshold wind speeds and could also locate the source of the emissions. Ideally, such a method would provide hourly PM_{10} emissions from each area of the lake bed and could be used in an air quality model to determine which areas of the lake bed were causing or contributing to violations of the PM_{10} NAAQS.

The District initiated a field monitoring program at Owens Lake in 1999 to identify dust source areas and to estimate their PM_{10} emissions and air quality impacts. This monitoring program is known as the Owens Lake Dust Source Identification Program (Dust ID Program). The Dust ID Program follows the data collection and analysis procedures described in the Owens Lake Dust ID Field Manual (GBUAPCD, 2007). Data collected from the Dust ID Program from January 2000 through June 2002 were used to identify the 29.8 square miles of dust source areas that were controlled through the 2003 SIP. Data and observations for the period from July 2002 through June 2006 were used to estimate PM_{10} emissions and air quality impacts that were used to identify the 13.2 square miles of dust control areas proposed for this 2008 SIP control strategy.

The Dust ID Program design was based on previous observations and field studies that suggested that PM_{10} emissions are related to the flux of saltating sand-sized particles. As shown conceptually in Figure 4.2, wind erosion involves particles that creep along the surface, and sand-sized particles or agglomerates that bounce or saltate across the surface. These creeping and saltating particles loosen other particles and abrade the surface, causing finer particles, including PM_{10} to go into suspension. Near the surface, creeping and saltating sand-sized particles are blown horizontally and finer dust particles are ejected and mix vertically in the turbulent air stream to form visible dust plumes. Previous research at Owens Lake and in other areas showed that the vertical flux of PM_{10} dust emissions is generally proportional to the horizontal flux of sand or saltation particles. Using this assumption, PM_{10} emissions were estimated from sand flux measurements that were taken with instruments placed in the saltation zone, which may range from the ground to about one meter above the surface. As discussed later in this section, the proportion of PM_{10} associated with the sand flux was later inferred by comparing monitored PM_{10} concentrations with the predicted concentrations from an air quality model.

Hourly sand flux rates are measured using electronic sensors and passive sand catchers that are placed on the lake bed. In 2001, there were 135 sand flux monitoring sites on the lake bed. They were initially spaced 1 kilometer apart in areas that were likely to produce dust. The monitoring network was increased every year and the monitoring density was increased in some areas to improve emission estimates for those areas. The maps in Figures 4.3 and 4.4 show the configuration of the Dust ID monitoring network in 2002 and 2006.

The proportion of PM_{10} to sand flux was found to increase during winter and spring, and was found to vary spatially on the lake bed with different soil textures. The proportionality factor, known as the K-factor (K_f), was used to estimate PM_{10} emissions at Owens Lake using Equation 4.2.

Equation 4.2

$$PM_{10} = K_f \times q$$

Where,

q = Sand flux measured at 15 cm above the surface [g/cm^2/hr]

K_f = K-factor, empirical ratio of the vertical PM_{10} emission flux to the horizontal sand flux at 15 cm.

Sand flux was measured using Cox Sand Catchers (CSCs), which are passive sand collectors, and Sensits, which are electronic erosion measurement devices. The Sensits were used to time-resolve the CSC mass to provide hourly sand flux. Sand flux was measured at 15 cm above the surface to represent a measurement of the total horizontal sand flux at the site. An analysis of the total horizontal sand flux measured from the surface to one meter showed that the sand flux at 15 cm was proportional to the total sand flux with very little deviation (Ono, *et al*., 2003a, and Gillette, *et al*., 2004).

The Dust ID network currently provides hourly PM_{10} emissions and source area information for dust source areas that are modeled as a series of grid cells that are 250 m by 250 m. In comparison, most air quality models used for PM_{10} SIPs lack good spatial information, and use 24-hour temporal resolution for their PM_{10} emission inventories. The fine-scale spatial and temporal resolution for the Owens Lake inventory was very useful for modeling wind-blown dust using the CALPUFF air quality model (Scire, *et al.*, 2000). The methods and results of the Dust ID Program are discussed in Chapters 6 and 7. Additional details can be found in Chapter 8 (Attachment C), Appendix B, Ono, *et al*., 2003a, Richmond *et al*., 2003 and the Owens Lake Dust ID Field Manual (GBUAPCD, 2007).

4.3.2 Sand Flux Measurements

Co-located Sensits and CSCs were used to determine hourly sand flux rates for each dust source area. Sensits are electronic sensors that measure the kinetic energy and the particle counts of sand-sized particles as they bounce across the surface. Due to differences in the electronic response of individual Sensits, each was co-located with a CSC to compare each Sensit output against the CSC-collected mass. An example of the linear relationship between the CSC mass and the output from a co-located Sensit is shown in Figure 4.5. By using collocated instruments, the CSC mass could be time-resolved to provide an hourly sand flux rate.

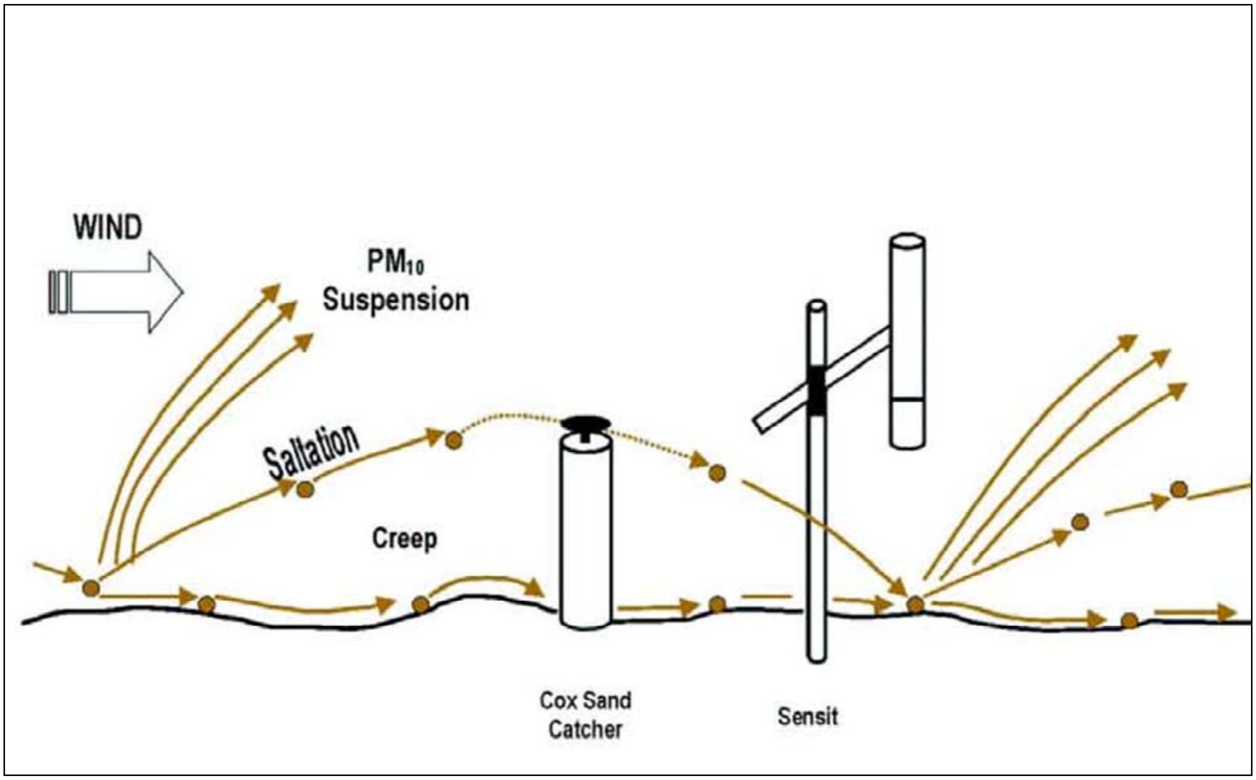

Figure 4.2 - Conceptual depiction of the wind erosion process with a Cox Sand Catcher and Sensit positioned in the saltation zone to measure sand flux

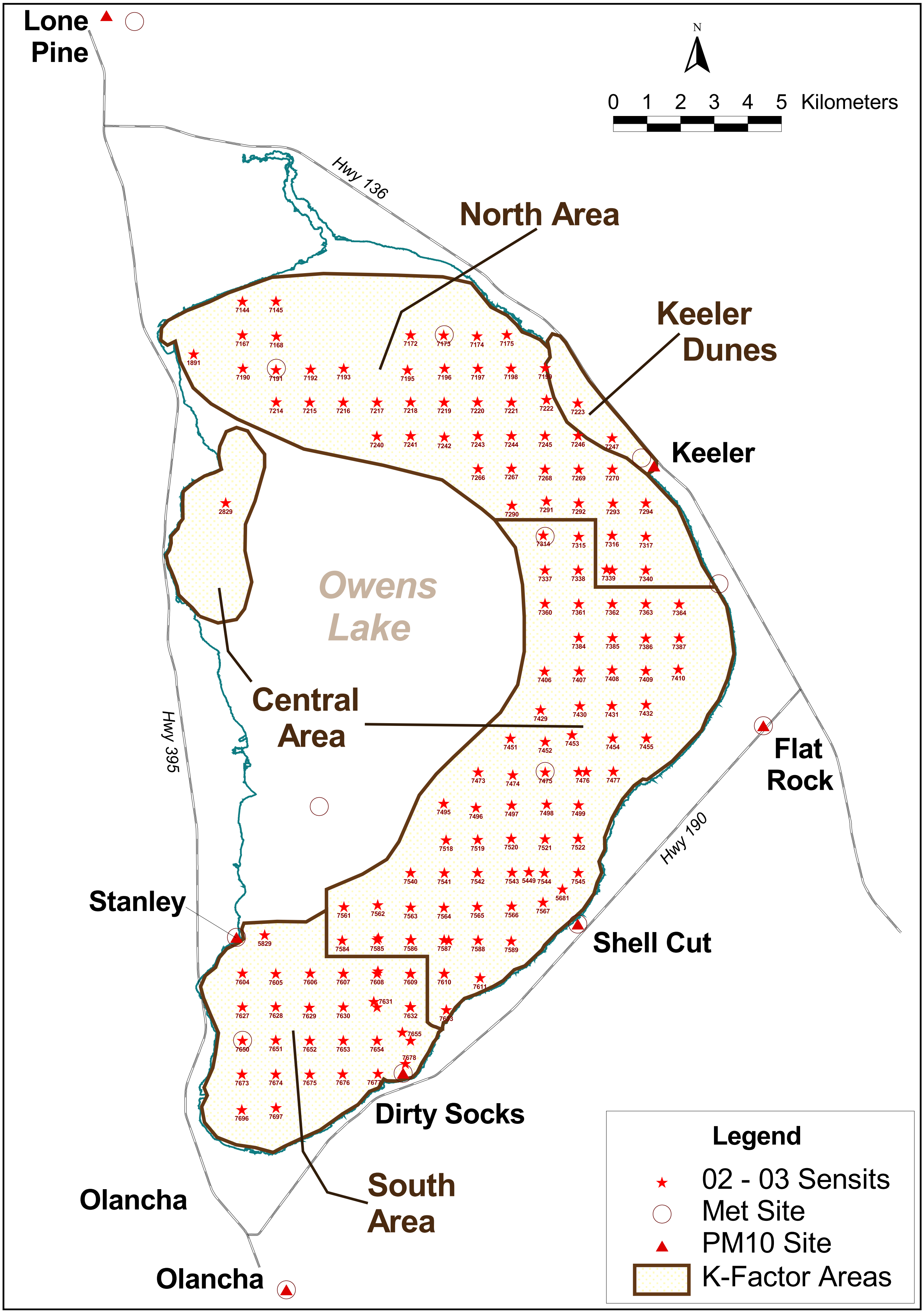

Figure 4.3 - Owens Lake Dust ID monitoring network 2002-2003

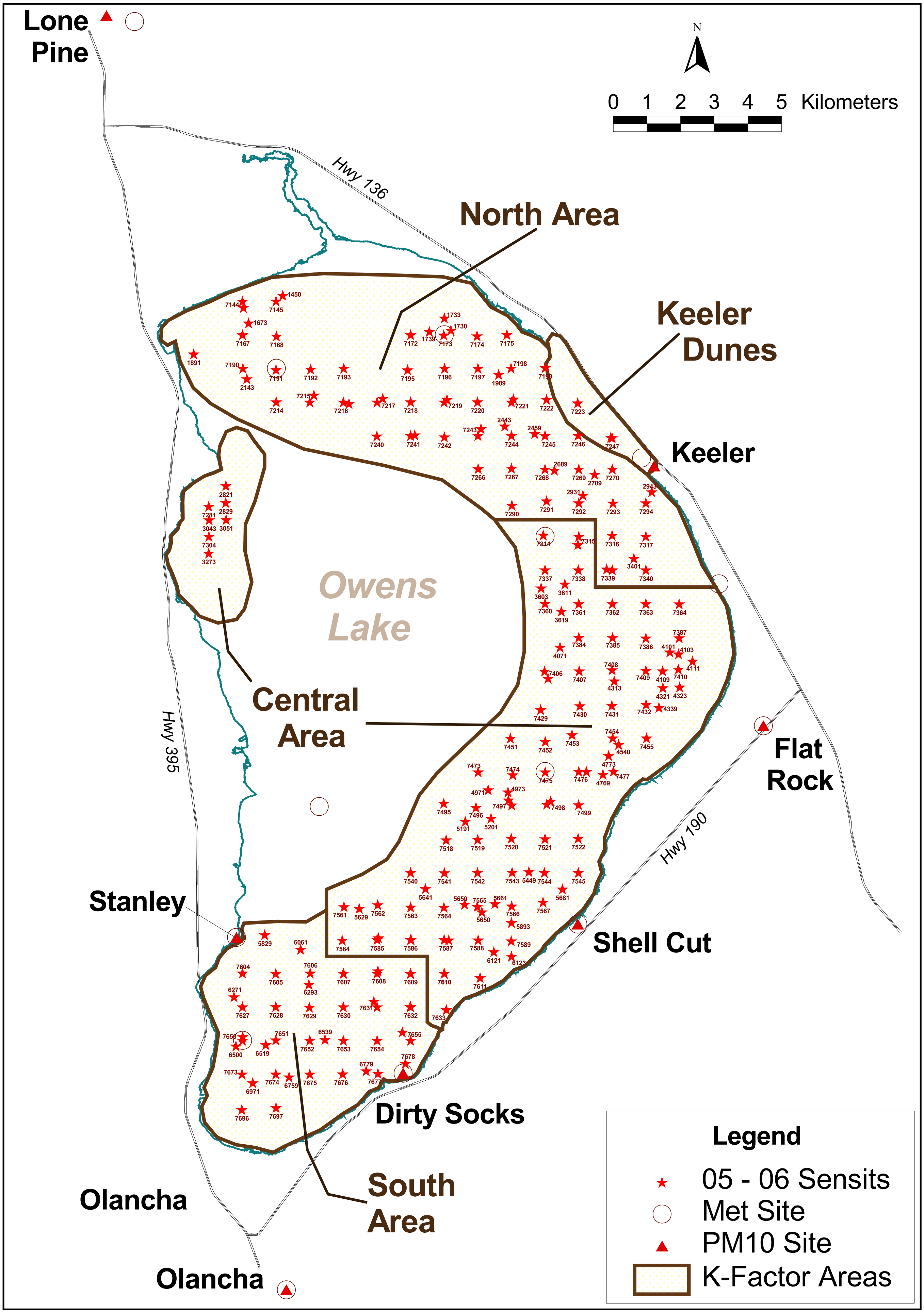

Figure 4.4 - Owens Lake Dust ID monitoring network 2005-2006

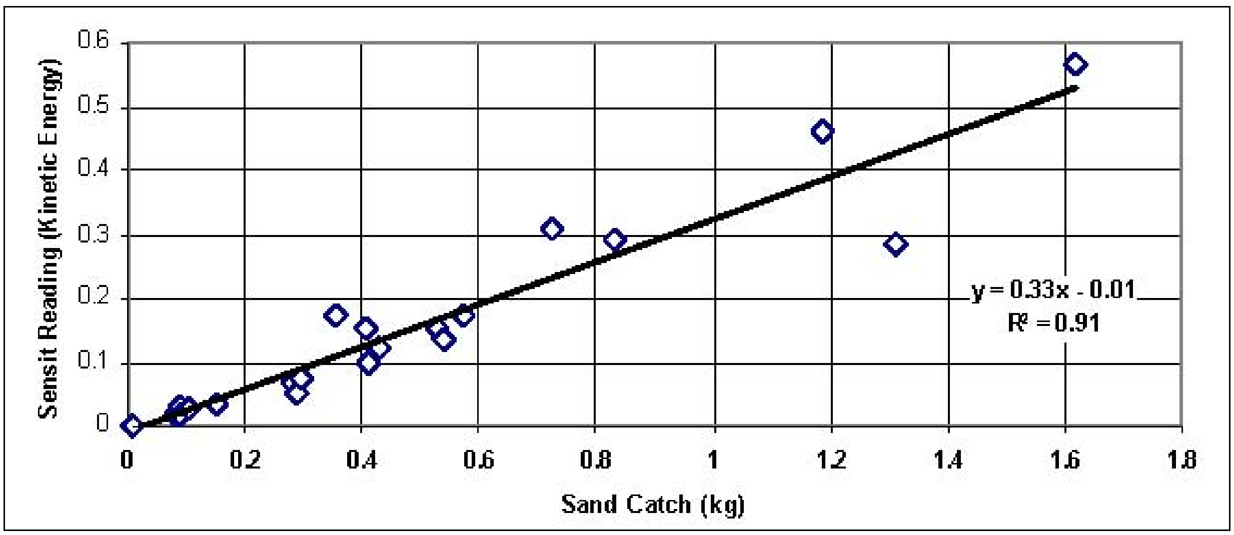

Figure 4.5 – An example of the linearity between CSC mass and Sensit readings (Sensit No. 7291 using total kinetic energy)

Figure 4.6 shows a Sensit suspended above the ground and a CSC in the ground to the left. Sensits are battery-powered with solar charging systems. A datalogger records 5-minute average data during active erosion periods. Data from the dataloggers are sent daily by radio transmission to the District's Keeler Office.

CSCs are passive instruments that capture sand-sized particles that are blown across the surface during a dust event. These instruments were designed and built by the District as reliable instruments that can withstand the harsh conditions at Owens Lake. CSCs have no moving parts and can usually collect sand for a month or more at Owens Lake without overloading the collectors. Field personnel must visit each CSC site to collect and weigh the sand catch. A diagram of the CSC is shown in Figure 4.7. The internal sampling tube and a height adjustment sleeve can be seen in the photo in Figure 4.8. The internal sampling tube is removed from the PVC casing to measure the sand catch sample. The lengths of the sampling tubes and casings are adjusted during construction to accommodate the amount of sand flux in each area and to avoid overloading the CSCs. The CSC length ranges from about 2 to 4 feet. Because the PVC casing is buried in the ground, an adjustment sleeve is used to keep the inlet height at 15 cm to compensate for surface erosion and deposition.

4.3.3 Source Area Mapping

The Dust ID Program includes four methods to locate dust source areas and to delineate the source area boundaries. The methods are: 1) visual mapping by trained observers, 2) time-lapse cameras, 3) surface inspections with GPS mapping, and 4) sand flux activity (as measured with Sensits and CSCs).

- Mapping Dust Source Areas from Off-Lake Observation Sites

During dust events, trained observers are stationed at viewpoints to create hourly maps of the visible boundaries of any dust source areas, their plume direction and note if the visible plume crosses the shoreline. To the extent practicable, all lake bed and off-lake dust sources are included in the observations. Figure 4.9 shows an example of sand flux measurements and the cumulative information that can be collected by observers mapping the dust plumes from different locations.

- Time-lapse Video

Remote time-lapse video cameras record dust events during daylight hours. This information is reviewed to help identify source areas that may have been missed by observers, or to help confirm source area activity detected by PM_{10} monitors or the sand flux network. Remote time-lapse video is also used to help verify modeled impacts that were not monitored by the PM_{10} network, to check compliance of dust control areas, and to identify off-lake sources not measured by any of the other methods.

- Mapping Using GPS

Dust observations, Sensit activity, elevated PM_{10} concentrations and video are used to initiate the deployment of field technicians to map the boundaries of dust source areas on the lake bed. The boundaries of the emissive area(s) are mapped using a Global Positioning System (GPS). Surveyors conducting the mapping ride an ATV or walk around the outer boundary of the wind-damaged surface surveying a line with the GPS. A wind-damaged surface is defined as a soil surface with wind erosion evidence and/or aeolian deposition that has not been modified to an unrecognizable point by precipitation since the last dust storm. Sometimes the boundaries of the erosion area are indistinct and it is not possible to visually map the source area. In that case, sand flux data may be the primary source of information to delineate the source area. The detailed procedures used to map dust source areas are described in the Owens Lake Dust ID Field Manual (GBUAPCD, 2007).

- Mapping Using Sand Flux Monitors

Dust source area boundaries can be delineated or refined using default cell boundaries represented by active sand flux monitors. The area represented by the active sand flux monitor site may be shaped to exclude known non-emissive areas, such as: existing DCM areas, wetlands, or areas with different soil texture where there is evidence that it is non-emissive.

The District compiles the cumulative mapping information from the visual observers and field inspections using the GPS into a Geographic Information System (GIS) database. Overlays of the maps generated from sand flux monitors, video cameras, visual observers and GPS'd source areas are compared qualitatively, considering the information may have been collected at different times. District staff analyzes all the available information and determines for each dust source area, the boundaries of that area and which sand flux monitor site best represents the erosion activity that took place in the dust source area. For modeling purposes, each source area is further broken into a series of 250 m by 250 m cells that fit the shape of the dust source area.

4.3.4 Temporal and Spatial K-factors

To estimate PM_{10} emissions using Equation 4.2, the proportion of PM_{10} to sand flux, or K-factors, must be determined for different areas and periods. A three step process was used to develop these spatial and temporal K-factors. The first step was to calculate K-factors for each hour of a dust event, the second step was to screen the hourly K-factors for weak plume impacts, and the final step was to group the hourly K-factors into spatial and temporal groups for the emissions inventory.

Hourly K-factors were inferred from the CALPUFF model by using hourly sand flux as a surrogate for PM_{10} emissions. Predicted PM_{10} concentrations were then compared to monitored concentrations at PM_{10} monitor sites to determine the K-factor that would correctly predict the monitored concentration for each hour. A K-factor of 5×10^{-5} was initially used to run the CALPUFF model and to generate concentration values that were close to the monitored concentrations. Hourly K-factor values were then adjusted in a post-processing step to determine the K-factor value that would make the modeled concentration match the monitored concentration at the PM_{10} monitor site. The initial K-factor was then adjusted using Equation 4.3.

Equation 4.3

$$K_f = K_i \left(\frac{C_{obs.} - C_{bac.}}{C_{mod.}} \right)$$

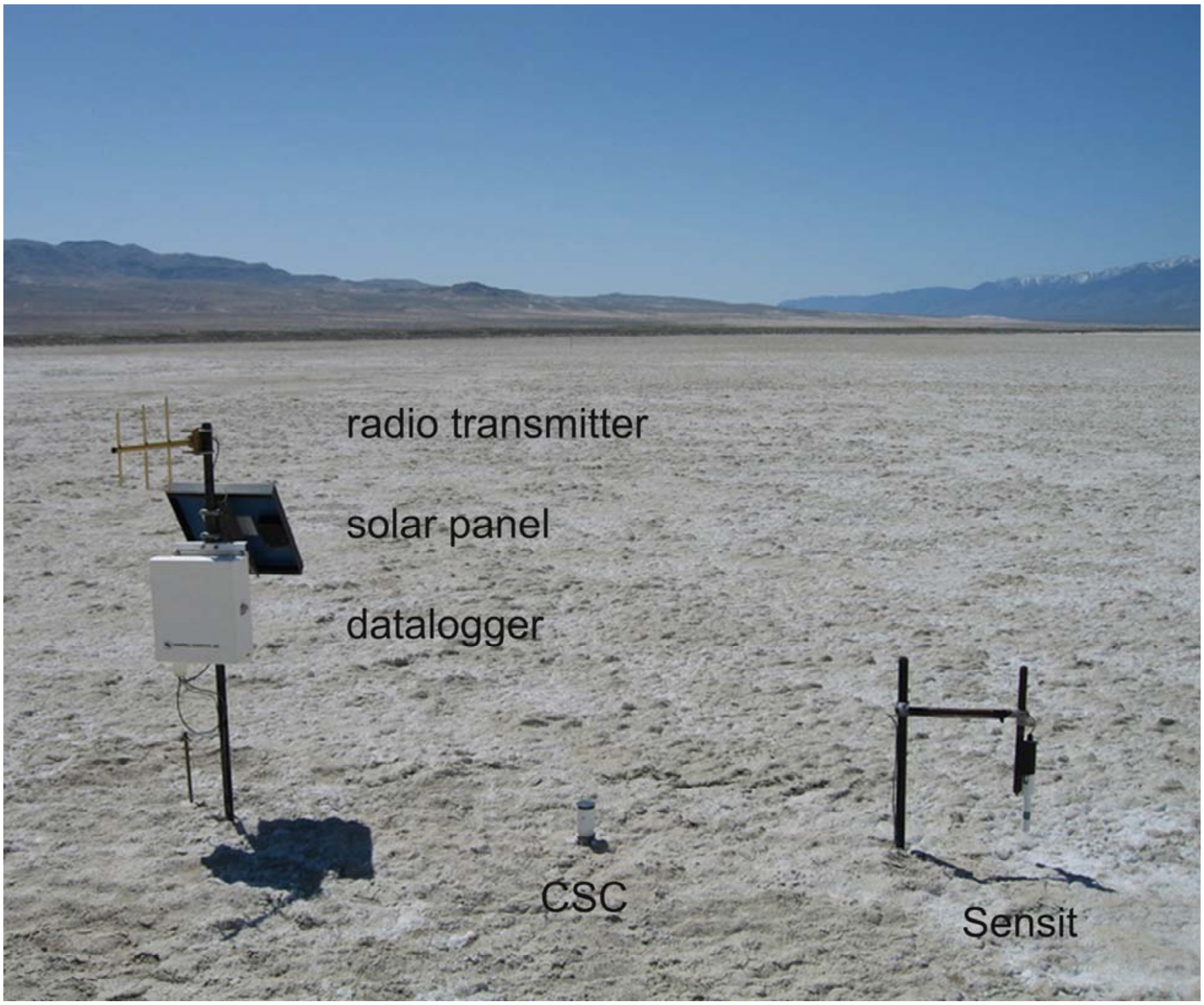

Figure 4.6 – Example of Dust ID sand flux monitor site on the Owens Lake bed

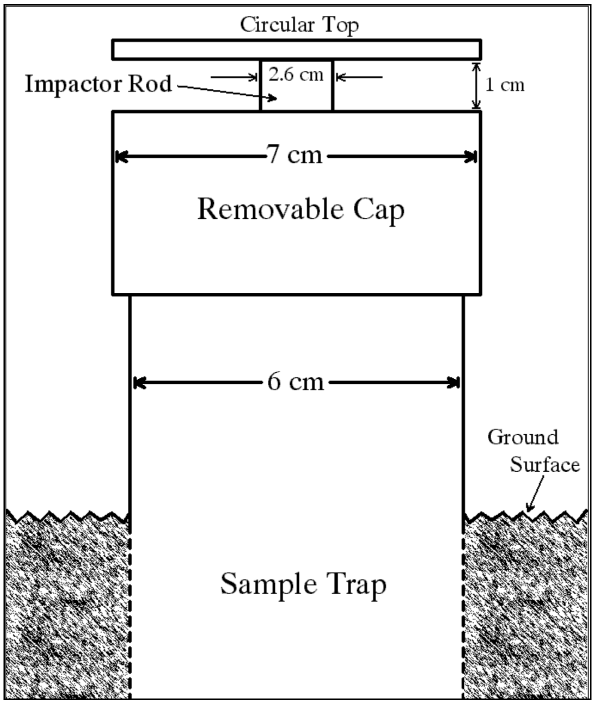

Figure 4.7 – Diagram of the Cox Sand Catcher CSC)
used to measure sand flux at Owens Lake


Figure 4.8 – Example of a Cox Sand Catcher (CSC)
with the inner sampling tube removed

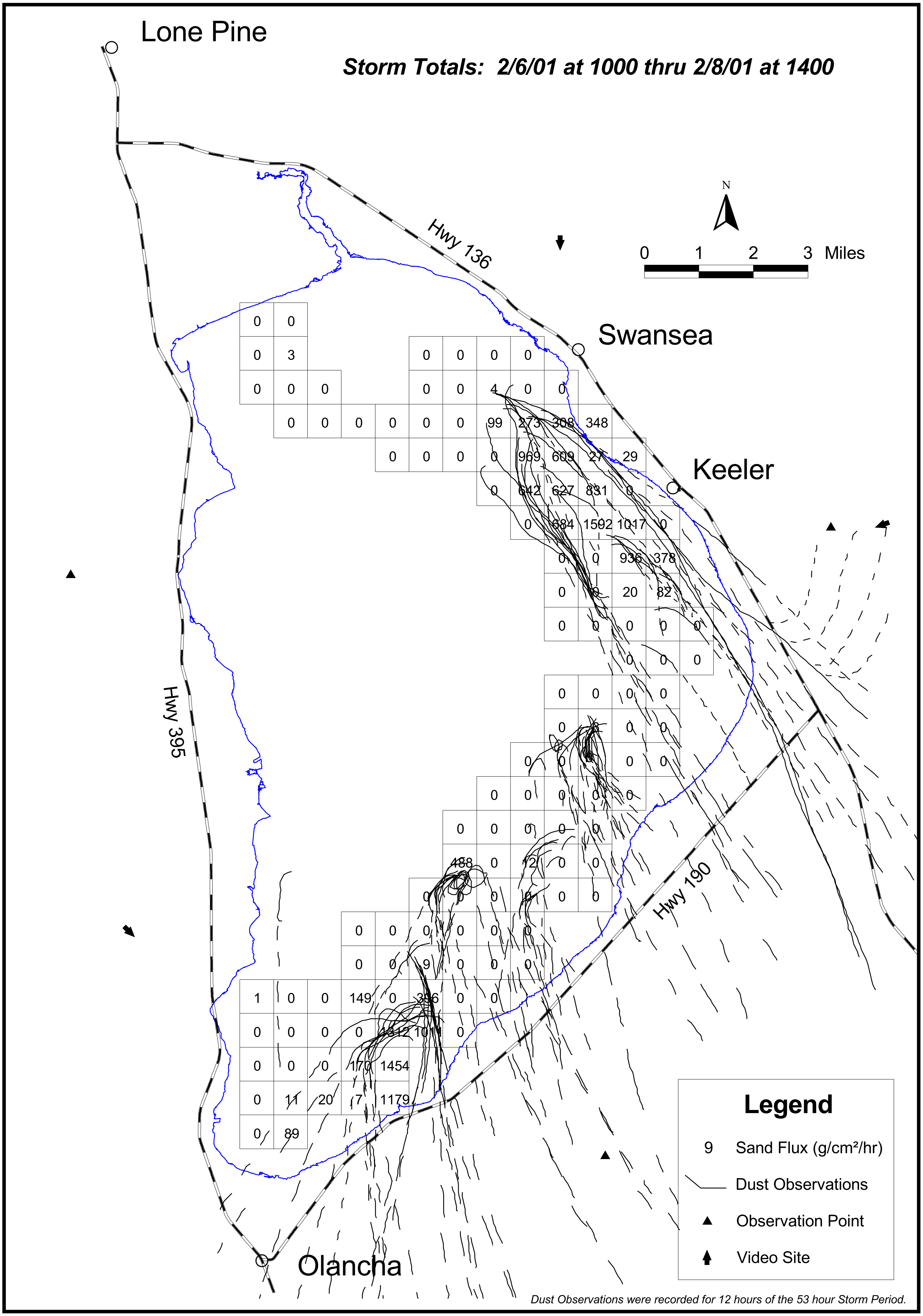

Figure 4.9 - Example of network sand flux measurements and visual observations during a dust event

Where:

K_i = Initial K-factor (5×10^{-5})
C_{obs} = Observed hourly PM_{10} concentration. (µg/m^3)
$C_{bac.}$ = Background PM_{10} concentration (assumed 20 µg/m^3)
$C_{mod.}$ = Model-predicted hourly PM_{10} concentration. (µg/m^3)

Hourly K-factors were screened to remove hours that did not have strong source-receptor relationships between the active source area (target area) and the downwind PM_{10} monitor. For example, the screening criteria excluded hours when a PM_{10} monitor site was located on the edge of a dust plume. Because the edge of a dust plume has a very high concentration gradient a few degrees error in the plume direction could greatly affect the calculated K-factor.

The hourly K-factor was excluded if it did not meet any of the following criteria:

1) Wind speed is greater than 5 m/s at 10-m height.
2) Hourly modeled and monitored PM_{10} concentrations were both greater than 150 µg/m^3 at the same monitor-receptor site.
3) Hourly wind direction is from the lake bed to the monitor site.
4) The mean sand flux for all sites with non-zero sand flux is greater than 0.5 g/cm^2/hr.
5) At least one sand flux grid center located within the target area and within a 30-degree upwind cone has sand flux greater than 2 g/cm^2/hr.
6) All sources are within a distance of 15 km of the receptor.
7) More than 65 percent of the PM_{10} contribution at a monitor site came from the target source area (North area, South area, Central area or Keeler dunes).
8) Eliminate hours when sand flux data are missing from one or more cells that are located within a 30-degree upwind cone and within 10-km of the shoreline monitor. For Olancha and Lone Pine, which are both located 5 to 10 km from the lake bed, the distance limitation is changed to 10 km upwind of the shoreline.

Figure 4.10 shows the hourly K-factors for the South area of the lake bed. The results show scatter in the hourly values, but the 75th percentile K-factor values (blue line) are relatively consistent during certain periods of the year. While the K-factors may change by a factor of two or three, their consistency is in contrast to the large shifts in the hourly sand flux rates, which often change by three orders of magnitude and drive the emissions using Equation 4.2. Hourly K-factors and storm averages for the South area, as well as other areas usually increase during the winter and early spring. This period corresponds to the formation of an efflorescent salt on the surface that forms a very powdery and loose surface. Efflorescent salts form annually at Owens Lake due to precipitation and cold temperatures.

In addition to the South area, three other areas of the lake bed were identified for the spatial K-factor sets: the Keeler dunes, the Central area and the North area. The boundaries of the four areas, which are shown on the map in Figure 4.3, were delineated by a survey of the surface soil textures. All four areas showed temporal K-factor trends, as well as some differences that may be attributed to different soil textures. Figure 4.11, Figure 4.12 and Figure 4.13 show the hourly and storm average K-factors for the Keeler dunes, Central area and North area from January 2000 through June 2006. Temporal cut-points for each area were subjectively selected based on shifts in the 75-percentile storm-average values, which also appeared to correspond to seasonal shifts in the observed surface conditions, such as efflorescent salt formation or surface crusting. The blue line in these figures represents the K-factor values that were used to estimate emissions using Equation 4.2.

Table 4.1 shows a summary of the temporal and spatial 75-percentile K-factors that were generated from the screened K-factors. For the 2003 SIP, it was determined through a model performance analysis of the 50-percentile, 75-percentile and 95-percentile storm-average, that the75-percentile storm-average values provided the best model performance for the high PM_{10} days and the attainment demonstration.

4.3.5 Daily and Annual PM_{10} Emissions for Lake Bed Areas

Using the Dust ID method, hourly, daily, and annual PM_{10} emissions can be calculated using Equation 4.2. In 2000, wind blown dust emissions from the lake bed were estimated at 76,191 tons of PM_{10} per year. The highest daily emission estimate from the lake bed was 6,956 tons on May 2, 2001. Annual PM_{10} emissions were not calculated for the years from 2002 through 2005. During this period, many of the key sand flux monitor sites were removed for the construction of control measures, so a complete data set that would be representative of lake bed emissions was not available. From July 2005 through June 2006 most of the active erosion sites were monitored for wind blown dust emissions. In 2006, wind blown dust emissions from the lake bed were estimated at 73,174 tons, with the highest daily emissions at 10,834 tons on February 15, 2006. The 2006 emissions inventory included many wind blown dust source areas that were not active during the 2000 emissions inventory period. Because of the addition of these new dust source areas, the 2006 emissions inventory for the lake bed is almost as high as the 2000 inventory, even though dust control measures were implemented on 16.5 square miles of the lake bed in 2003.

In future years, PM_{10} emissions from dust control areas will be generated from construction-related activities and from residual PM_{10} emissions from the lake bed. Construction-related emissions may be generated by fugitive dust from unpaved roads, installing drainage systems, pipes, or berms, and preparing the soil to plant saltgrass. PM_{10} emissions from construction activities are estimated at 59.5 pounds per day, and 10.4 tons per year (GBUAPCD, 2007b). These emissions are not included in the emissions inventory, since construction is a transient activity that will be completed in less than a year on each control area, and because including them may double count the uncontrolled wind-blown dust emissions that would be generated from the same area. The District requires that the City take reasonable measures to control and minimize fugitive dust emissions caused during dust control measure construction activities.

4.3.6 Daily and Annual PM_{10} Emissions for Off-Lake Dune Areas

In addition to the PM_{10} source areas on the Owens Lake playa, PM_{10} emissions are also generated from off-lake source areas adjacent to the lake bed. The two main sources consist of the Keeler dunes and the Olancha dunes (Figure 4.14). The Keeler dunes are included in the Dust ID network and emissions can be calculated for them in the same manner as for emissions from lake bed areas. The Keeler dunes PM_{10} emissions estimate for 2006 is 8,386 tons, with maximum day emissions of 680 tons on May 27, 2006. This is higher than the emission estimate in 2000 of 2,909 tons per year. The maximum day emission estimate was 252 tons on May 2, 2001.

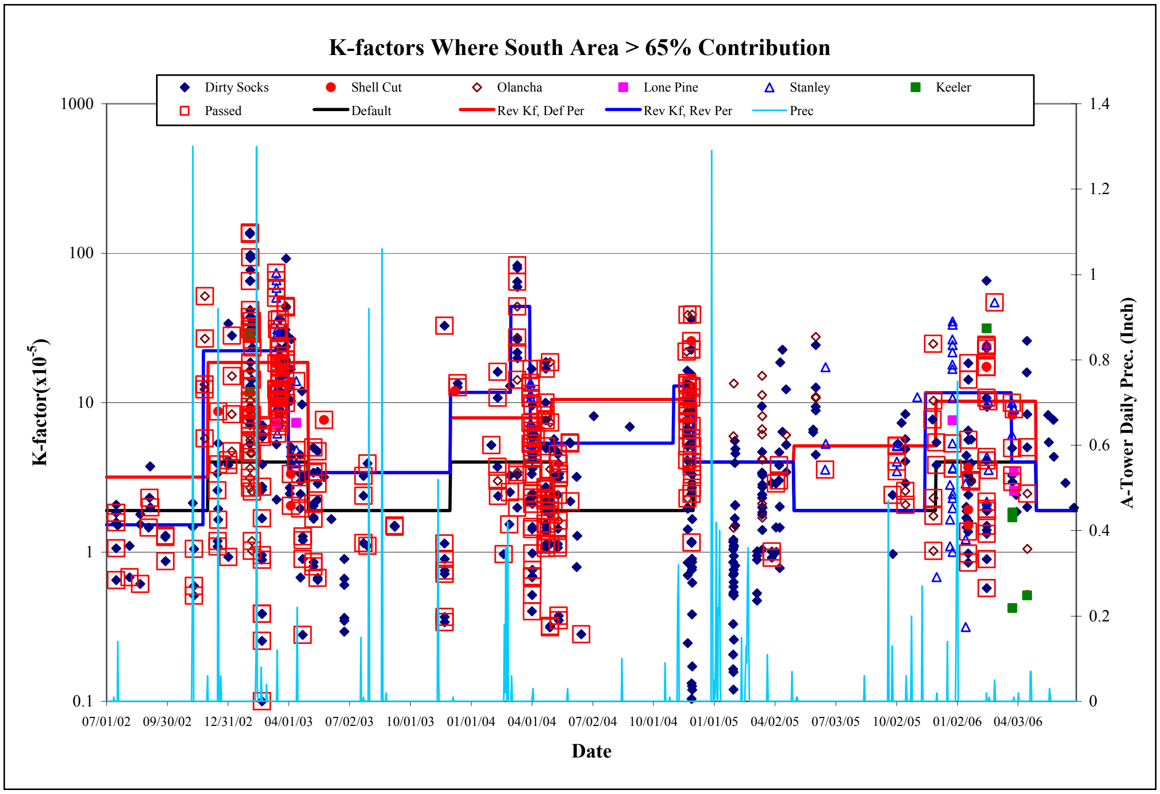

Figure 4.10 – Hourly and period K-factors for the South area.

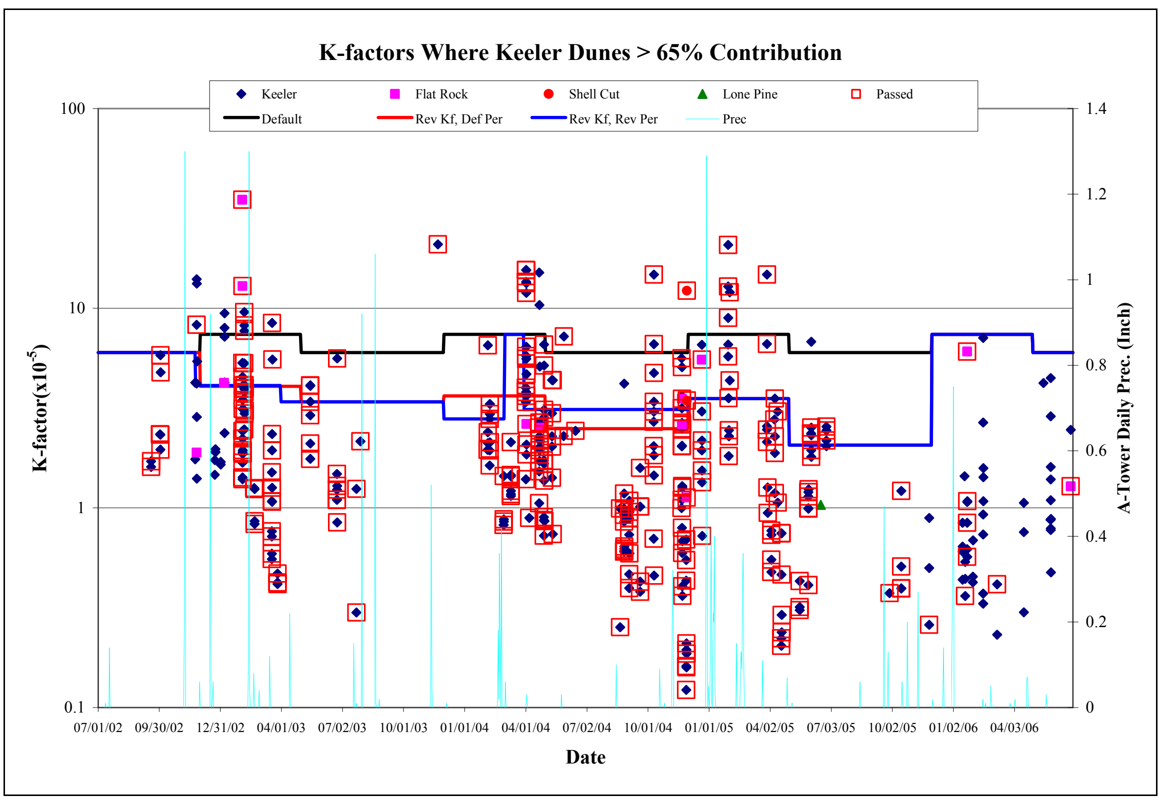

Figure 4.11 – Hourly and period K-factors for the Keeler dunes.

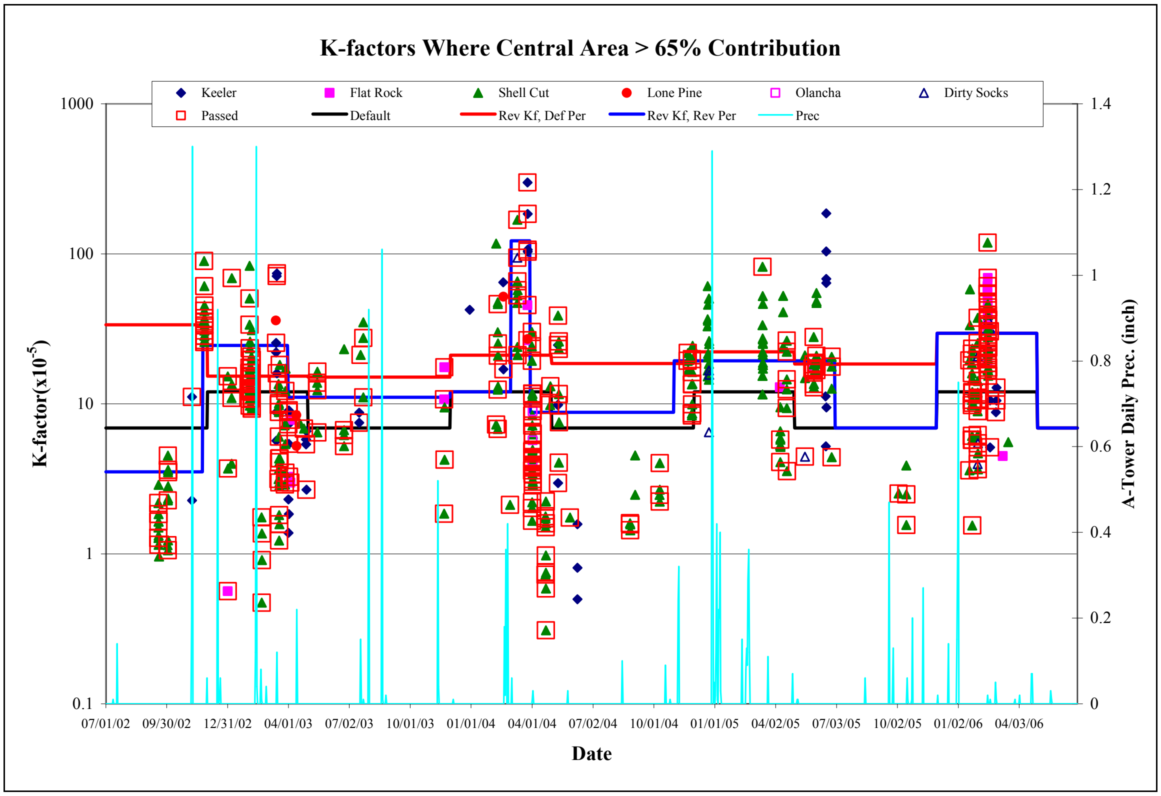

Figure 4.12 – Hourly and period K-factors for the Central area.

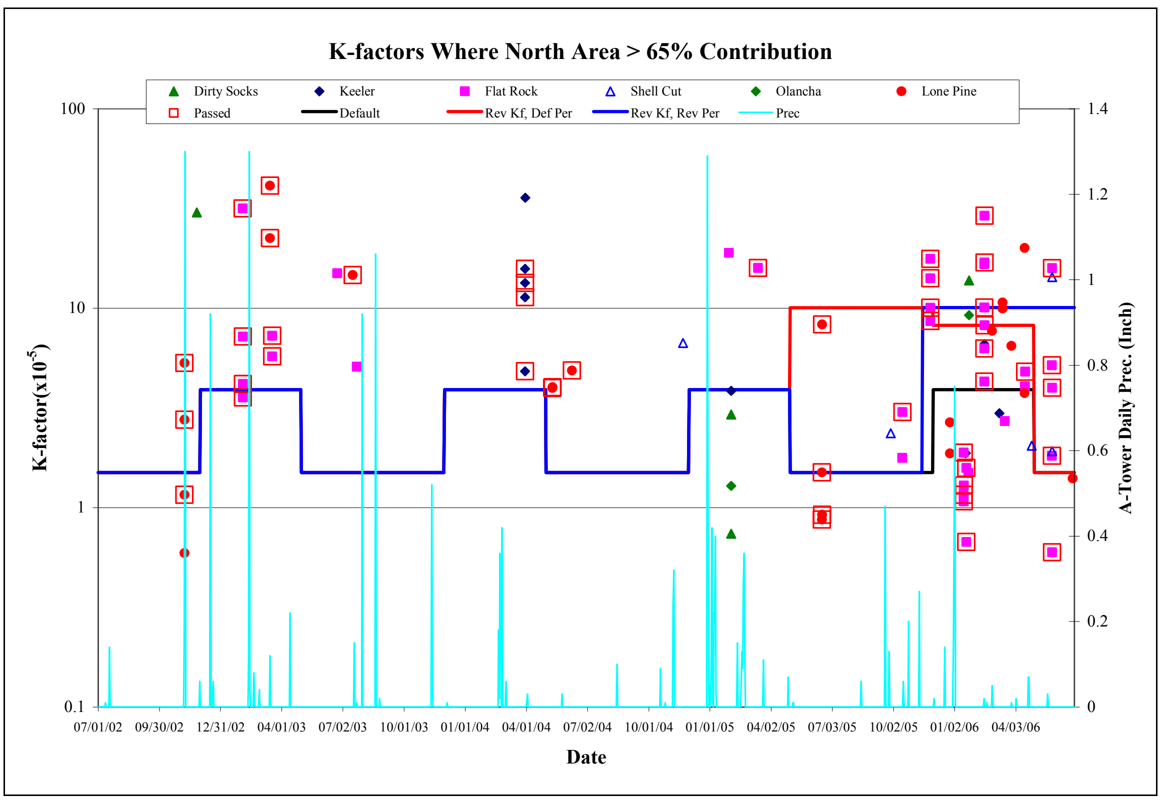

Figure 4.13 – Hourly and period K-factors for the North area.

Table 4.1 – 75-percentile storm-average K-factors were determined to provide spatial and temporal values to estimate hourly emissions and model ambient PM_{10} impacts.

Period		K-factors (10^{-5}) For Different Source Areas			
Start	End	Keeler Dunes	North Area	Central Area	South Area
1/1/2000	2/3/2001	5.1	2.1	6.6	1.9
2/4/2001	4/18/2001	5.1	2.1	25.7	6.7
4/19/2001	11/30/2001	5.1	2.1	6.3	1.9
12/1/2001	3/8/2002	20.1	7.7	35.7	5.8
3/9/2002	4/18/2002	5.5	5.1	6.9 *	9.0
4/19/2002	6/30/2002	5.5	5.0	6.6	1.8
7/1/2002	11/23/2002	6.0 *	1.5 *	3.5	1.5
11/24/2002	11/30/2002	4.1	1.5 *	24.5	22.3
12/1/2002	3/31/2003	4.1	3.9 *	24.5	22.3
4/1/2003	4/30/2003	3.4	3.9 *	11.0	3.4
5/1/2003	11/30/2003	3.4	1.5 *	11.0	3.4
12/1/2003	2/29/2004	2.8	3.9 *	12.0 *	11.7
3/1/2004	3/29/2004	7.4 *	3.9 *	122.1	44.0
3/30/2004	4/30/2004	3.1	3.9 *	8.8	5.4
5/1/2004	10/31/2004	3.1	1.5 *	8.8	5.4
11/1/2004	11/30/2004	3.1	1.5 *	19.3	12.9
12/1/2004	4/30/2005	3.5	3.9 *	19.3	4.0 *
5/1/2005	6/30/2005	2.1	1.5 *	19.3	1.9 *
7/1/2005	11/14/2005	2.1	1.5 *	6.9 *	1.9 *
11/15/2005	11/30/2005	2.1	10.1	6.9 *	11.6
12/1/2005	3/24/2006	7.4 *	10.1	29.6	11.6
3/25/2006	4/30/2006	7.4 *	10.1	29.6	4.0 *
5/1/2006	6/30/2006	6.0 *	10.1	6.9 *	1.9 *

* *Denotes default K-factors from the 2003 SIP. Other K-factors are based on the 75th percentile average over at least 9 samples passing the Dust ID Program screening criteria.*

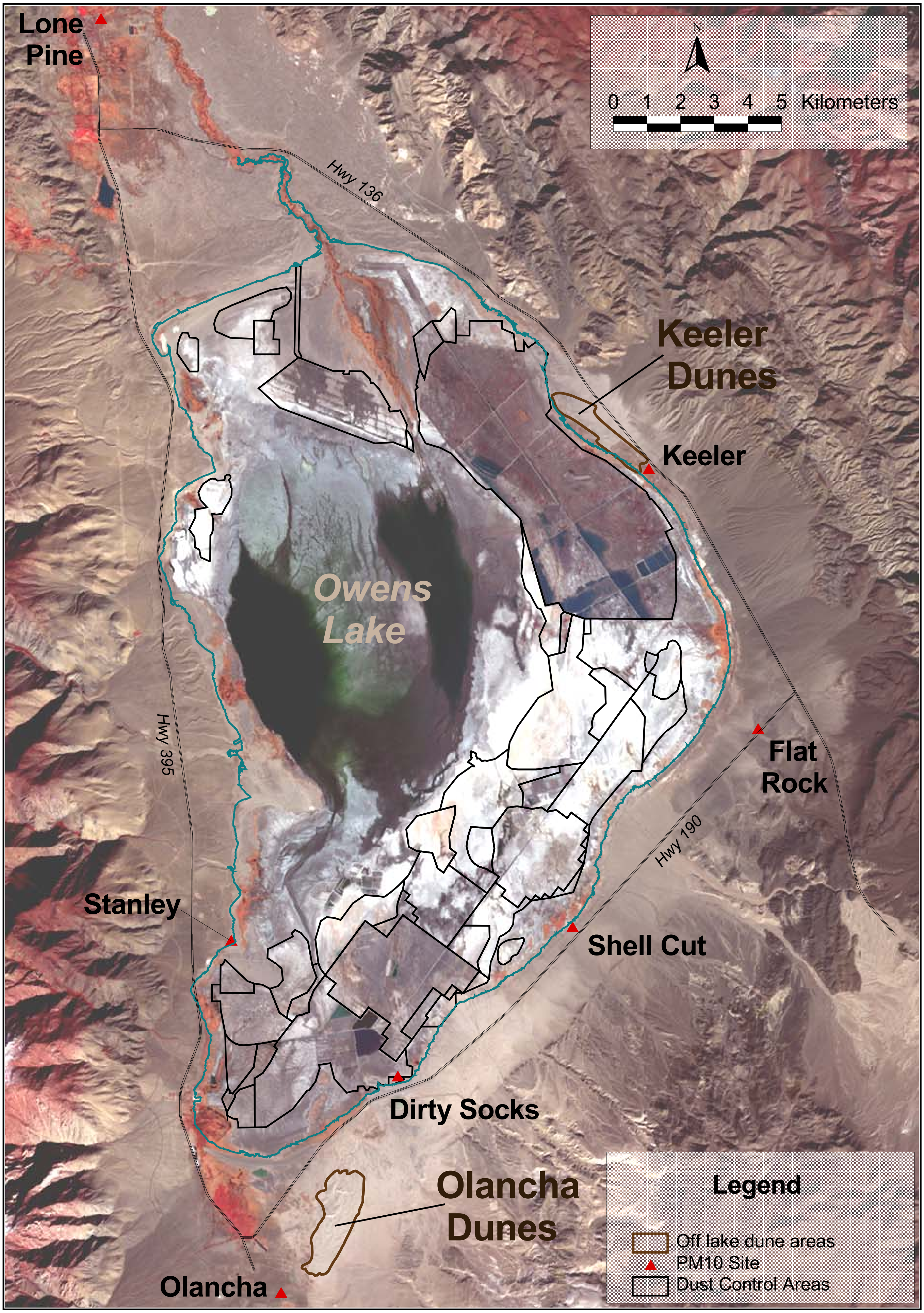

Figure 4.14 - Map of off-lake dune areas

Table 4.2 Summary of the annual emissions forecast for all PM_{10} emission source categories in the planning area for the period from 1997 through 2017.

	TONS OF PM_{10} PER YEAR										
SOURCE CATEGORY	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Total - All Sources	***83,212***	***83,212***	***83,212***	***83,212***	***83,197***	***60,938***	***59,758***	***46,729***	***50,412***	***85,684***	***46,279***
Lake Bed Emissions											
2003 DCA	76,191	76,191	76,191	76,191	76,191	52,716	51,958	40,416	40,416	40,167	762
2008 Moat & Row										10,787	10,787
2008 SF SDCA										21,117	21,117
2008 Study Area										883	883
Other Lake Bed Areas										220	220
Subtotal	***76,191***	***76,191***	***76,191***	***76,191***	***76,191***	***52,716***	***51,958***	***40,416***	***40,416***	***73,174***	***33,769***
Off-Lake Dunes											
Keeler Dunes	2,909	2,909	2,909	2,909	2,894	4,110	3,688	2,201	5,872	8,386	8,386
Olancha Dunes	1,298	1,298	1,298	1,298	1,298	1,298	1,298	1,298	1,298	1,298	1,298
Subtotal	***4,207***	***4,207***	***4,207***	***4,207***	***4,192***	***5,408***	***4,986***	***3,499***	***7,170***	***9,684***	***9,684***
Other Emission Sources											
Prescribed Burning	2,532	2,532	2,532	2,532	2,532	2,532	2,532	2,532	2,532	2,532	2,532
Unpaved Road Dust	84	84	84	84	84	84	84	84	84	84	84
Paved Road Dust	77	77	77	77	77	77	77	77	88	88	88
Industrial Facilities	81	81	81	81	81	81	81	81	81	81	81
Residential Woodburning	36	36	36	36	36	36	36	36	36	36	36
Vehicle Tailpipe	3	3	3	3	3	3	3	3	4	4	4
Agricultural Operations	1	1	1	1	1	1	1	1	1	1	1
Subtotal	***2,814***	***2,814***	***2,814***	***2,814***	***2,814***	***2,814***	***2,814***	***2,814***	***2,826***	***2,826***	***2,826***

Table 4.2 Continued

	TONS OF PM_{10} PER YEAR									
SOURCE CATEGORY	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total - All Sources	***46,279***	***46,279***	***36,361***	***15,832***	***15,832***	***15,832***	***7,530***	***7,535***	***7,535***	***7,535***
Lake Bed Emissions										
2003 DCA	762	762	762	762	762	762	762	762	762	762
2008 Moat & Row	10,787	10,787	865	865	865	865	865	865	865	865
2008 SF SDCA	21,117	21,117	21,117	588	588	588	588	588	588	588
2008 Study Area	883	883	883	883	883	883	883	883	883	883
Other Lake Bed Areas	220	220	220	220	220	220	220	220	220	220
Subtotal	***33,769***	***33,769***	***23,847***	***3,318***	***3,318***	***3,318***	***3,318***	***3,318***	***3,318***	***3,318***
Off-Lake Dunes										
Keeler Dunes	8,386	8,386	8,386	8,386	8,386	8,386	84	84	84	84
Olancha Dunes	1,298	1,298	1,298	1,298	1,298	1,298	1,298	1,298	1,298	1,298
Subtotal	***9,684***	***9,684***	***9,684***	***9,684***	***9,684***	***9,684***	***1,382***	***1,382***	***1,382***	***1,382***
Other Emission Sources										
Prescribed Burning	2,532	2,532	2,532	2,532	2,532	2,532	2,532	2,532	2,532	2,532
Unpaved Road Dust	84	84	84	84	84	84	84	84	84	84
Paved Road Dust	88	88	92	92	92	92	92	97	97	97
Industrial Facilities	81	81	81	81	81	81	81	81	81	81
Residential Woodburning	36	36	36	36	36	36	36	36	36	36
Vehicle Tailpipe	4	4	4	4	4	4	4	4	4	4
Agricultural Operations	1	1	1	1	1	1	1	1	1	1
Subtotal	***2,826***	***2,826***	***2,830***	***2,830***	***2,830***	***2,830***	***2,830***	***2,835***	***2,835***	***2,835***

Olancha dunes emissions are estimated using research on alluvial fan areas east of the Keeler dunes (Nickling *et al*., 2001). Emissions from these two dune fields are calculated below and are included in the emission inventory.

There are additional off-lake source areas present along the east and southeastern portion of the lakeshore. These sources consist of natural alluvial fan sand deposits on the lower slopes of the Inyo and Coso Mountains mixed with secondary source material blown up from the exposed Owens Lake playa. The boundaries of these areas are diffuse and poorly defined and the PM_{10} emission rates associated with these areas are unknown. Emissions from these diffuse areas are assumed to be much less than both the lake bed and the two dune fields and are not included in the emission inventory.

Most of these off-lake sources of wind-blown dust were formed by material that was initially entrained from the exposed playa and then deposited in areas off the lake bed (Holder, 1997). The Olancha dunes were present prior to the early 20^{th} century desiccation of Owens Lake, but subsequent lake bed dust storms have deposited additional sand and dust in the dune field. These dust deposition areas are secondary sources of dust that can be entrained under windy conditions. After the lake bed source areas are controlled, PM_{10} emissions from the off-lake dunes are expected to decline (Niemeyer, 1996).

Peak daily and annual PM_{10} emissions from the Olancha dunes were estimated from the Keeler dune emissions, which were measured as part of the Dust ID network. An estimate of PM_{10} emissions was made using Equation 4.4.

<u>*Equation 4.4*</u>

$$PM\text{-}10 = \left(\frac{F_{KD}}{A_{KD.}}\right) \times A_D \times R_D$$

Where,

F_{KD} = PM_{10} emissions from the Keeler dunes (252 tons/day or 2,909 tons/year)
A_{KD} = Area size of the Keeler dunes = 1.84 sq. km
A_D = Area size of Olancha dunes = 3.04 sq. km
R_D = Ratio of Olancha dunes to Keeler dune K-factors (0.27)

The Olancha dune emission estimate is based on comparing the Olancha dune area to the Keeler dune emissions from 2000. Since there were no sand-flux monitors on the Olancha dunes, the Olancha dunes are assumed to have similar activity levels (sand flux per unit area per time) as the Keeler dunes, and to have a K-factor similar to the alluvial fan sand deposits east of the Keeler dunes. The Olancha dunes K-factor is expected to be similar to the alluvial fan area, because they are both farther from the lake bed than the Keeler dunes. Because of the greater distance from the lake bed, more PM_{10} is winnowed out of the dune material as it is transported farther from the lake bed. Wind tunnel tests showed that dunes located on the alluvial fan east of the Keeler dunes had an average K-factor of 1.0×10^{-5}, while the average Keeler dune K-factor was 3.7×10^{-5} for the same period (Nickling, *et al*., 2001). This yields a K-factor ratio between the two areas of 0.27. Dune area sizes are based on estimates made for the 1998 SIP (GBUAPCD, 1998a).

4.4 PM_{10} EMISSIONS FORECAST

Table 4.2 provides a summary of the annual emissions forecast for all the emission source categories in the planning area for the period form 1997 to 2017. Wind blown dust emissions are broken out into the emissions from the areas that are discussed in the proposed control strategy. PM_{10} emissions from the control areas are projected based on the 2006 emission inventory and emission reductions using the target minimum dust control efficiency for each control area.

4.5 REFERENCES

Caltrans, 2005. California Department of Transportation, California Motor Vehicle Stock, Travel and Fuel Forecast, Sacramento, California, December 30, 2005.

CARB, 1997. Memorandum from Patrick Gaffney to Duane Ono, Re: Owens Valley Emissions Data, California Air Resources Board, Sacramento, California, January 8, 1997.

CARB, 2007a. California Air Resources Board, website for California Emissions Inventory Data, accessed July 25, 2007, http://www.arb.ca.gov/ei/ei.htm.

GBUAPCD, 1998a. Great Basin Unified Air Pollution Control District, Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan, GBUAPCD, Bishop, CA, November 16, 1998.

GBUAPCD, 2005. Great Basin Unified Air Pollution Control District, Inyo National Forest, USDI Bureau of Land Management, Operations Plan for Wildland Fire Use Smoke Management, GBUAPCD, Bishop, California, May 2, 2005.

GBUAPCD, 2007a. Great Basin Unified Air Pollution Control District, Owens Lake Dust ID Field Manual, GBUAPCD, Bishop, California, Draft: January 24, 2007.

GBUAPCD, 2007b. Great Basin Unified Air Pollution Control District, 2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Draft Subsequent Environmental Impact Report, State Clearing House Number 2007021127, GBUAPCD, Bishop, California**,** September 14, 2007.

Gillette, *et al*., 2004. Gillette, Dale, Duane Ono, Ken Richmond*, A Combined Modeling and Measurement Technique for Estimating Wind-Blown Dust Emissions at Owens (dry) Lake, CA,* Journal of Geophysical Research, Volume 109, January 17, 2004.

Holder, 1997. Holder, Grace M., Off-Lake Dust Sources, Owens Lake Basin, Great Basin Unified Air Pollution Control District, Bishop, California, June 1997.

Keisler, 1997. Keisler, Mark, memorandum from Great Basin Unified Air Pollution Control District, to Duane Ono, GBUAPCD, regarding crop acreage for Southern Inyo County, GBUAPCD, Bishop, California, March 1997.

McKee, 1996. McKee, Lucinda, letter from U.S. Department of Agriculture-Forest Service, to Duane Ono, Great Basin Unified Air Pollution Control District, regarding historic smoke emissions for inclusion in the State Implementation Plans for Owens Valley, Mammoth Lakes and Mono Basin, Bishop, California, June 13, 1996.

Murphy, 1997. Murphy, Timothy P., memorandum from Great Basin Unified Air Pollution Control District Soil Scientist to Mark Kiesler, GBUAPCD, regarding silt analysis results for unpaved road surfaces in Keeler and the Cerro Gordo Road, GBUAPCD, Bishop, California, January 14, 1997.

Nickling, *et al*., 2001. Nickling, W.G., C. Luttmer, D.M. Crawley; J.A. Gillies; and N. Lancaster, Comparison of On- and Off-Lake PM_{10} Dust Emissions at Owens Lake, CA, University of Guelph, Guelph, Ontario, Canada, February 2001.

Niemeyer, 1996. Niemeyer, Tezz C., Characterization of Source Areas, Size and Emission Rates for Owens Lake, CA: Fall 1995 through June 1996, Environmental Consulting, Olancha, California, November 1996.

Ono, 1997. Ono, Duane, PM_{10} Emission Factors for Owens Lake Based on Portable Wind Tunnel Tests from 1993 through 1995, Great Basin Unified Air Pollution Control District, Bishop, California, January 1997.

Ono, *et al*., 2003a. Ono, Duane, Ellen Hardebeck, Scott Weaver, Billy Cox, Nikolai Barbieri, William Stanley, Ken Richmond, and Dale Gillette, Locating and Quantifying Wind-Blown Dust PM_{10} Emissions at Owens Lake, California, *A&WMA's 96th Annual Conference & Exhibition*, June 2003, San Diego, California, Paper #69487, Air & Waste Management Association, Pittsburgh, Pennsylvania, June 2003.

Ono, *et al*., 2003b. Ono, Duane, Scott Weaver, Ken Richmond, Quantifying Particulate Matter Emissions from Wind Blown Dust Using Real-time Sand Flux Measurements, *USEPA 2003 Emission Inventory Conference*, April 29-May 1, 2003, San Diego, California, United States Environmental Protection Agency, Research Triangle Park, North Carolina, May 2003.

Richmond, *et al*., 2003. Richmond, Ken, Duane Ono, Ellen Hardebeck, Scott Weaver, Billy Cox, Nikolai Barbieri, William Stanley,and Dale Gillette, Modeling Wind-Blown Dust Emissions and Demonstrating Attainment with National Ambient Air Quality Standards at Owens Lake, California, *A&WMA's 96th Annual Conference & Exhibition*, June 2003, San Diego, California, Paper #69495, Air & Waste Management Association, Pittsburgh, Pennsylvania, June 2003.

Scire, et al., 2000. Scire, J.S.; Strimaitis, D.G.; Yamartino, R.J. A User's Guide for the CALPUFF Dispersion Model (Version 5). Earth Tech, Inc., 196 Baker Avenue, Concord, MA 01742, January 2000.

US Census Bureau, 2007. U.S. Census Bureau, State and County QuickFacts, accessed July 25, 2007, http://quickfacts.census.gov/qfd/states/06/06027.html .

USEPA, 2006a. United States Environmental Protection Agency, Compilation of Air Pollutant Emission Factors, AP-42, http://www.epa.gov/ttn/chief/ap42/index.html at http://www.epa.gov/ttn/chief/ap42/ch13/index.html at http://www.epa.gov/ttn/chief/ap42/ch13/final/c13s0202.pdf

USEPA, 2006b. United States Environmental Protection Agency, Compilation of Air Pollutant Emission Factors, AP-42, http://www.epa.gov/ttn/chief/ap42/index.html at http://www.epa.gov/ttn/chief/ap42/ch13/index.html at http://www.epa.gov/ttn/chief/ap42/ch13/final/c13s0205.pdf

CHAPTER 5

PM_{10} Control Measures

FIGURES

TABLES

5

PM_{10} Control Measures

5.1 INTRODUCTION

Owens Lake PM_{10} control measures or, more commonly, dust control measures (DCMs), are defined as those methods of PM_{10} abatement that could be placed on portions of the Owens Lake playa and when in place are effective in reducing the PM_{10} emissions from the surface of the playa. Since 1980 the District and other researchers have been involved with the study of the lake environment and the mechanisms that cause Owens Lake's severe dust storms. Since 1989 the District has pursued a comprehensive research and testing program to develop PM_{10} control measures that are effective in the unusual Owens Lake playa environment. Three dust control measures have been approved for use on the lake and have been designated as a Best Available Control Measure (BACM) by the District (GBUAPCD, 2003). These measures include Shallow Flooding, Managed Vegetation, and Gravel Blanket. In addition, as provided for in the 2006 Settlement Agreement (GBUAPCD, 2006b) and based on the results of a demonstration project conducted by the City of Los Angeles (City), a fourth dust control measure may be implemented on a portion of the Dust Control Area (DCA). This alternative measure is known as Moat & Row.

Dust control measures that were tested on the lake, but were shown to not be effective or practical dust control measures for the SIP, include the use of sprinklers, chemical dust suppressants, surface compaction, sand fences and brush fences. These measures were discussed in the "Owens Valley PM_{10} Planning Area Demonstration of Attainment SIP Projects Alternatives Analysis" document (GBUAPCD, 1996), in the Final Environmental Impact Report (EIR) (GBUAPCD, 1997), EIR Addendum Number 1 (GBUAPCD, 1998b) for the 1998 SIP and in the EIR for the 2003 SIP (GBUAPCD, 2003).

Implementation of all DCMs on the lake bed is subject to appropriate analysis under the California Environmental Quality Act (CEQA) and permitting and approvals by other responsible agencies. A detailed analysis of the environmental impacts of the DCMs to be completed by April 1, 2010 can be found in the project-level EIR prepared for this 2008 SIP (GBUAPCD, 2008). In addition to the District using the 2008 EIR as the CEQA-compliance document for this SIP, the City intends to use the document to meet its CEQA requirements for issuance of construction contracts for the project. Additional descriptions of the control measures as they have been implemented by the City are found in the City's two Mitigated Negative Declarations for Phases 1 and 2 of the project (LADWP, 2000 and LADWP 2001). For the attainment demonstration included in Chapters 6 and 7 of this 2008 SIP, the District is specifying that the PM_{10} control measures used will be BACM and consist of Shallow Flooding, Managed Vegetation and Gravel Blanket, as well as the possibility of the non-BACM demonstration measure known as Moat & Row. All dust control measures shall be designed, constructed, operated and maintained to achieve the required minimum dust control efficiencies (MDCE) as described in the 2006 Settlement Agreement.

This chapter includes a brief description of the three BACM dust control measures, a discussion of the PM_{10} emissions after the control measure is implemented and the conditions that need to be met to achieve the necessary level of control. This chapter also includes a conceptual description of the Moat & Row dust control measure. A more detailed description of the Moat & Row measure will be available following the results of the current testing being conducted by the City. These descriptions contain both mandatory and conceptual elements and are provided to illustrate how the control strategy mandated by this 2008 SIP may be feasibly implemented. Chapter 7 of this document will show where these controls will be used on the playa to achieve the National Ambient Air Quality Standard (NAAQS) for PM_{10}. The mandatory elements of the control strategy are set forth in the Board Order in Chapter 8. Control strategy elements not mandated by this 2008 SIP are left to the discretion of the City and are subject to approval by the California State Lands Commission (CSLC) when DCMs are applied on lands under their management. Nothing in this SIP is intended to give the CSLC, or any other public agency, more authority than their authority under law.

5.2 SHALLOW FLOODING

5.2.1 Description of Shallow Flooding for PM_{10} Control

The naturally wet surfaces on the lake bed, such as seeps, springs and the remnant brine pool, are resistant to windblown dust emissions. These naturally wet areas are found where groundwater is discharged on to the lake bed or where surface water (such as water from the Owens River or Cartago Creek) flows across the lake bed surface (Figure 5.1). The areal extent of wetting depends mainly upon the amount of water present on the surface, evaporation rate and lake bed topography. The size of the wetted area is less dependent on soil type because, once the water table is raised to the playa surface, surface evaporation is virtually soil-type independent. The Shallow Flooding DCM mimics the physical processes that occur at and around natural springs and wetlands and can provide dust control over large areas with reasonably minimal and cost-effective infrastructure. The goal of Shallow Flooding is to provide dust control by maintaining sufficiently wet surfaces. As a result ponding will occur in topographic lows creating habitat conditions for insects and shore birds.

Two methods of Shallow Flooding have been employed by the City on the lake bed since the first DCMs began operation in 2001. The first, known as sheet flooding, consists of releasing water from arrays of low-flow water outlets spaced at intervals of between 60 and 100 feet along pipelines laid along lake bed contours. The pipelines are spaced between 500 and 800 feet apart. This arrayed configuration of water delivery creates large, very shallow sheets of braided water channels. Water depths in sheet flooded areas are typically at most just a few inches deep. The lower edge of sheet flooded areas has containment berms to capture and pond excess flows. The water slowly flows across the typically very flat lake bed surfaces downhill to tail-water ponds where pumps recirculate the water back to the outlets. Figure 5.2 shows sheet flooding from ground level. Figure 5.3 is an aerial photo of a sheet flooded area.

To maximize project water use efficiency, flows to sheet flow areas are regulated at the outlets so that only sufficient water is released to keep the soil wet. Although the quantity of excess water is minimized through system operation, any water that does reach the lower end of the control area is collected and recirculated back through the water delivery system. At the lower end of the sheet flooded areas, or at intermediate locations along lower elevation contours, excess water are collected along collection berms and pumped back up to the outlets to be reused.

The second method of Shallow Flooding employed by the City is known as pond flooding. Pond-flooded areas have water containment berms that allow ponds to be formed that submerge the emissive lake bed areas. These ponds are much deeper than sheet-flooded areas—pond waters are up to four feet deep. The containment berms are typically rock-faced to protect them from wave erosion. Water is usually delivered through one large water inlet per pond. Water is delivered to the pond area until the pond reaches a size and depth sufficient to submerge the required amount of emissive area. Water delivery then ceases until evaporation reduces the pond size to a set minimum. Figure 5.4 shows pond flooding from ground level. Figure 5.5 is an aerial photo of a pond-flooded area.

Based on the City's operation of Shallow Flood DCMs in 2006 and 2007, approximately 3.1 to 4.2 acre-feet of supplied water, respectively, were required to control PM_{10} emissions from an acre of lake bed. It should be noted that below normal rainfall in 2007 resulted in the need to supply more water to the Shallow Flood DCMs to maintain the required 75% wetness cover. It is anticipated that after April 1, 2010 the annual amount of water needed for each acre of Shallow Flood DCM will be reduced as a result of relaxing the wetness cover requirements during the fall and the spring ramping flow periods as discussed in Section 5.2.3.

Non-wetted infrastructure associated with the Shallow Flood DCM includes raised berms, roadways, equipment pads and their associated sloped shoulders (Figure 5.6). In some cases the shoulders are rock-faced to protect them from wave erosion. Well-traveled roads are typically paved with gravel; less-traveled roads and berms are unpaved.

Shallow Flooding requires water transmission, distribution and outlet infrastructure, excess water retention, collection and redistribution infrastructure and the construction of electrical power lines, access roads and water control berms as discussed in the EIR for the 2008 SIP.

The City is required to construct water-retention berms along the down-gradient and side boundaries of each Shallow Flooding irrigation block to prevent leakage and increases in the rate, quantity, or quality of dust control waters and storm water flows to the brine pool area or mineral lease area. These berms will be designed to collect both natural and applied excess surface water along the side and downslope borders of each irrigation block. The requirement to provide water-retention berms does not apply to Shallow Flood area T36-4, due to its adjacency to the Owens River delta and the need to minimize surface disturbances in this area.

5.2.2 PM_{10} Control Effectiveness for Shallow Flooding

Shallow Flooding has been shown to be very effective on a large scale for controlling wind-blown dust and PM_{10} at Owens Lake. Between 1993 and 1996 the District conducted a 600-acre test on the sand sheet between Swansea and Keeler. Effectiveness was evaluated in four ways; a) from aerial photographs assuming that flooded areas provided 100 percent control, b) from portable wind tunnel measurements of test and control areas, c) from fetch transect (1-dimensional) analysis of sand motion measurements, and d) from areal (2-dimensional) analysis of sand motion measurements. The average control effectiveness was 99 percent with surface water coverages of 75 percent and about 60 percent when the site was 30 percent wet (Hardebeck, *et al.*, 1996).

In 2000 the City began construction on a 13.5 square-mile shallow flood project on the north end of the lake bed. Shallow Flooding operations began in December 2001. By December 2006 the City had constructed and is currently operating over 26 square miles of Shallow Flooding DCMs. Visual observations and monitoring since the implementation of existing shallow flood facilities have shown no significant dust plumes originating in properly operated Shallow Flooding areas.

PM_{10} emissions from the 16.5 square mile Shallow Flood dust control area that was completed at the end of 2003 were calculated based upon Dust ID program emission estimates before and after controls were implemented. The control efficiency for this shallow flood area averaged 99.8 percent in 2004. Prior to shallow flooding, PM_{10} emissions for the area were estimated at 35,775 tons in 2000. After shallow flooding, PM_{10} emissions were reduced to an estimated 60 tons from the same area in 2004.

Due to the extreme levels of PM_{10} emissions from Owens Lake before the implementation of DCMs began in 2000, the District required that the City construct and operate all Shallow Flood DCMs to achieve 99 percent PM_{10} control efficiency. Based on the District's research in the 1990s, this meant that all Shallow Flood areas had to be maintained at 75 percent wet. However, not all of the additional emissive areas that require control under this 2008 SIP (Supplemental Dust Controls) require 99 percent effectiveness in order to achieve the PM_{10} NAAQS at the historic shoreline. Based on data collected between July 2002 and June 2006, air quality modeling shows that the actual required levels of PM_{10} control vary from 30 percent to over 99 percent. These varying required control efficiencies reflect the fact that different areas of the lake bed have different emissions rates and that areas closer to the historic shoreline require higher control efficiencies than similar areas well away from the shoreline. Based on air quality modeling conducted using the 2002 through 2006 data, the minimum dust control efficiencies (MDCE) for the Supplemental Dust Control areas are shown in Figure 5.7. All additional DCMs constructed under the provisions of this 2008 SIP will be constructed and operated to achieve the MDCEs shown in Figure 5.7. All DCMs constructed prior to 2007 will be required to continue to achieve 99 percent MDCE, except during the ramping flow periods discussed in Section 5.2.3.

For Shallow Flooding, varying MDCEs can be provided by varying the percent of an emissive area that is kept wet. Based on the District's research, a curve has been developed that relates percent water cover with percent PM_{10} control efficiency. This curve is shown in Figure 5.8. The City will use this curve, along with the MDCEs shown in Figure 5.7 to construct and operate the Shallow Flooding Supplemental Dust Control areas. The required control efficiency for Shallow Flooding areas constructed prior to 2007 will remain at 99 percent. The District and the City will collaboratively work to refine the curve in Figure 5.7.

5.2.3 Fall and Spring Shallow Flooding Ramping Flow Operations

Based on data collected between 2002 and 2006, air quality modeling shows that areas normally requiring 99 percent control efficiency during the most intense wind and surface emissivity conditions do not require that extreme level of control at other, less emissive, times. Dust emissions from the lake bed during early October and from mid-May through June are typically lower in intensity than during the peak winter through early spring dust season. These periods of

Figure 5.1 – Natural shallow flooding – flows from shoreline seeps and springs out on to lake bed

Figure 5.2 – Shallow Flooding – ground level view of sheet flood method

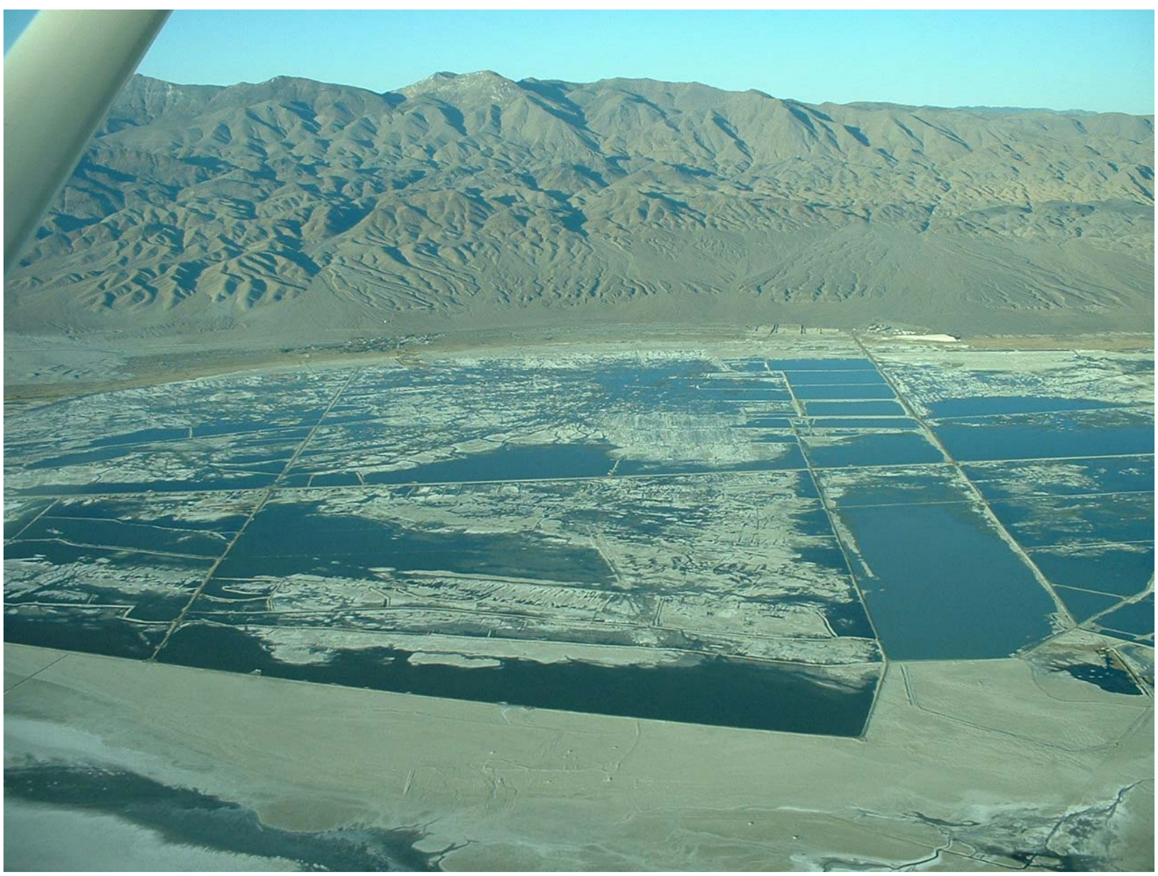

Figure 5.3 – Shallow Flooding – aerial view of sheet flood method (left side of photo)

Figure 5.4 – Shallow Flooding - ground level view of pond flood method

Figure 5.5 – Shallow Flooding – aerial view of pond flood method (left side of photo)

Figure 5.6 – Shallow Flooding – raised equipment pads with armored berms

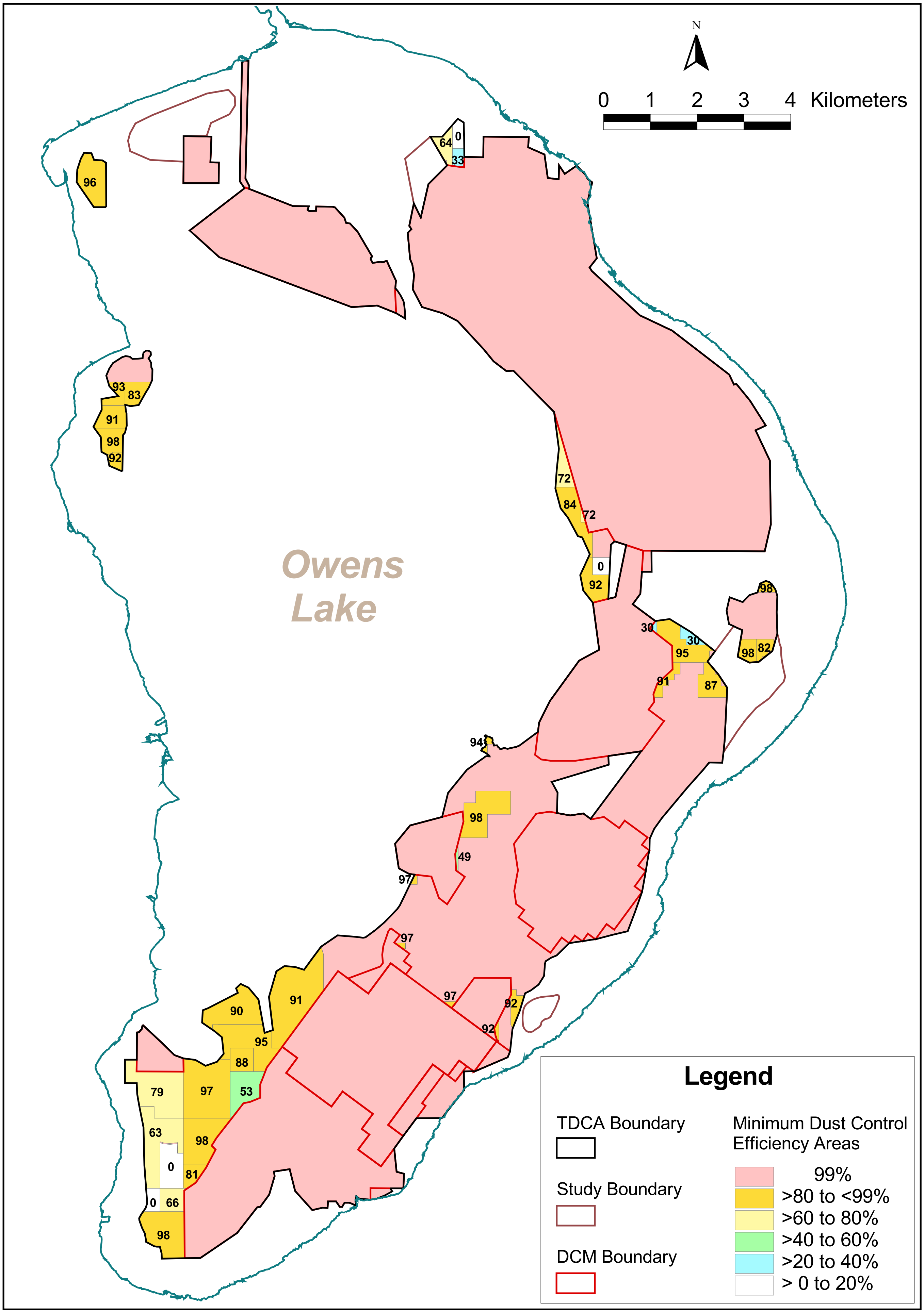

Figure 5.7 - TDCA Minimum Dust Control Efficiency map

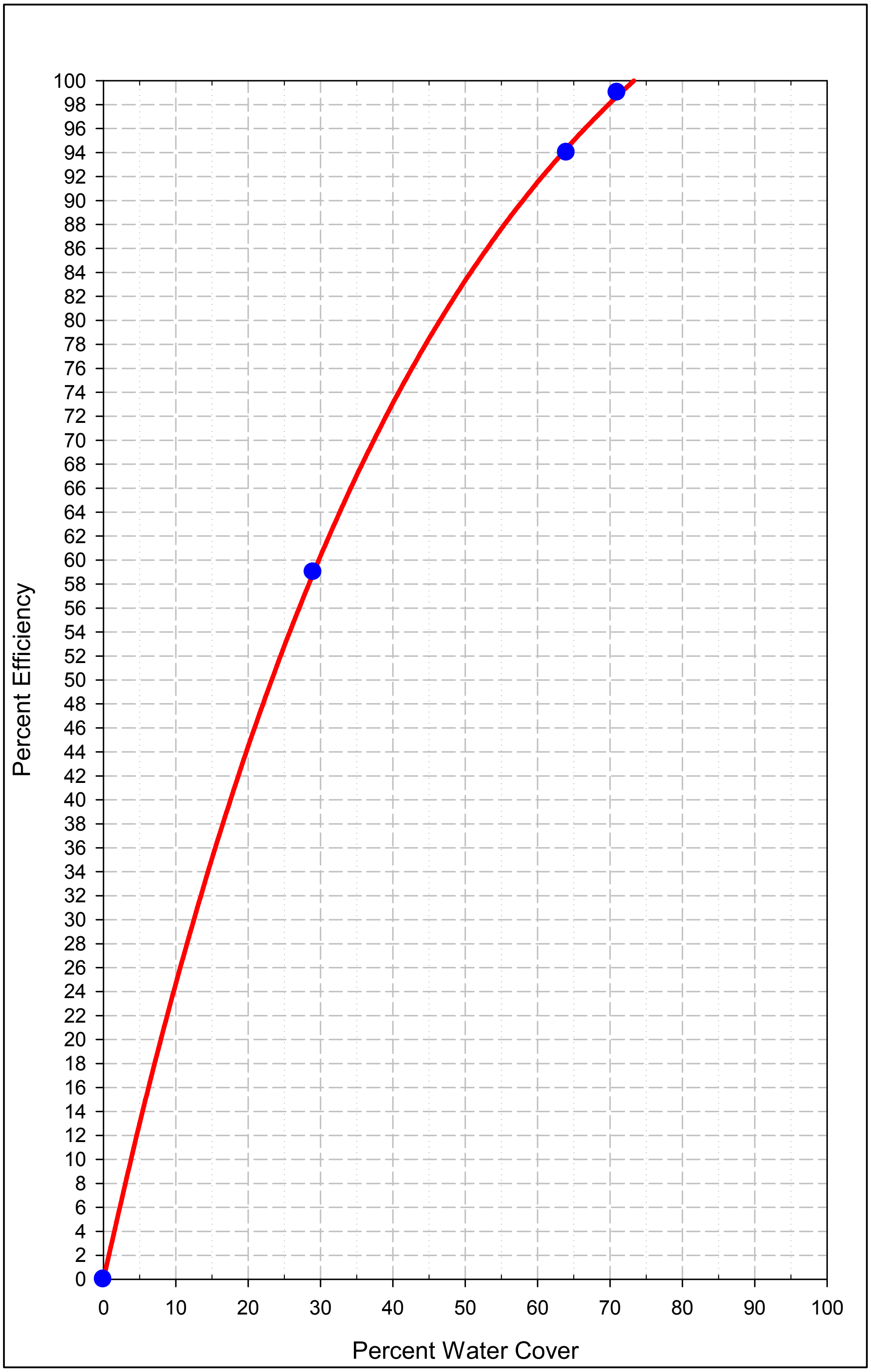

Figure 5.8 - Shallow Flood control efficiency curve

lower emission conditions are referred to as the PM_{10} "shoulder seasons." These lower emission conditions are a result of lower wind speeds and less emissive conditions during the shoulder seasons. Therefore, in order to conserve water resources, while providing the level of PM_{10} control necessary to attain and maintain the federal PM_{10} NAAQS, the provisions of this 2008 SIP will allow the City to reduce the PM_{10} control efficiencies of the Shallow Flooding DCM during the period from October 1 through October 15 and from April 1 through June 30.The percentage of dust control areas that are required to be wet will be ramped up in the fall and ramped down in the spring. The amount of wetting reductions are described below.

5.2.3.1 Fall Shoulder Season — October 1 through October 15

Under the provisions of the 2003 SIP, the City is required to have Shallow Flooding DCM areas fully wetted and operational at the start of the dust season on October 1 of every year. However, in order to get the current 26 square miles of Shallow Flooding areas sufficiently wet by October 1, water deliveries actually start in late August. This means that some level of dust control is actually being provided outside the dust control season as the DCM areas "wet up." Based on data collected during the period from July 2002 through June 2006, as well as District staff's experience over more than two decades on the lake bed, the first two weeks of October are not a period when the lake bed typically experiences highly emissive conditions. Therefore, in order to conserve water resources, full levels of dust control will not be required until October 16 of each year. From an operational standpoint, however, gradually increasing levels of dust protection will occur starting in early September as water deliveries begin. These protection levels will ramp up as additional water is delivered until full levels of protection are provided on October 16. The October shoulder season adjustments will go into effect in October 2010.

5.2.3.2 Spring Shoulder Season — May 16 through June 30

Under the provisions of the 2003 SIP, the City is required to have Shallow Flooding DCM areas fully wetted and operational through the end of the dust season on June 30 of every year. However, based on data collected during the period from July 2002 through June 2006, the required MDCEs are lower during the late spring than they are during the winter and early spring. This is due to the formation of durable, less emissive summer salt crusts on the surface of the lake bed. Late spring is also a time when temperatures in the Owens Valley begin to warm dramatically. The 21-year (1985 through 2005) average temperature for Keeler in March is 54°F—it rises 24 degrees to 78°F for June. Higher air temperatures mean that more of the water applied to DCM areas is lost to evaporation. Therefore, in acknowledgement that the lake bed is naturally less emissive in late spring than during the winter and that, due to increasing temperatures, the City has to apply more water to wet the same amount of area, in order to conserve water resources, starting after April 1, 2010, areas requiring 99 percent MDCE will have the following wetness requirements:

- From October 16 of every year through May 15 of the next year, Shallow Flooding areas with 99 percent MDCE shall have a minimum of 75 percent areal wetness cover.
- From May 16 through May 31, Shallow Flooding areas with 99 percent MDCE shall have a minimum of 70 percent areal wetness cover.
- From June 1 through June 15, Shallow Flooding areas with 99 percent MDCE shall have a minimum of 65 percent areal wetness cover.
- From June 16 through June 30, Shallow Flooding areas with 99 percent MDCE shall have a minimum of 60 percent areal wetness cover.

If any of the Shallow Flooding areas that are allowed to have reduced wetness during the spring shoulder season fail to meet even the reduced wetness requirements, it is possible that the areas failed to meet their minimum targets because not enough water could be delivered through the water distribution infrastructure. Therefore, if the City fails to meet the spring shoulder season targets that start on May 16 and there were no monitored or modeled exceedances of the federal standard at the historic shoreline, those areas that did not meet the reduced minimums will be deemed to be in compliance, if the City demonstrates in writing and the APCO reasonably determines in writing that maximum water delivery mainline flows were maintained throughout the applicable period. This provision does not penalize the City as long as the maximum amount of water is delivered to the site and there are no NAAQS exceedances.

Shallow Flooding areas with less than 99 percent MDCEs shall not be allowed any spring shoulder season areal wetness reductions.

5.2.4 Shallow Flooding Operational Refinements

The District's research on the Shallow Flooding DCM in the 1990s established the relationship between the amount of water coverage on an emissive area and the PM_{10} control effectiveness provided (Hardebeck, *et al.*, 1996). Research control effectiveness varied from as high as 99 percent when 75 percent of an area was wetted down to 60 percent control when water covered 30 percent of the test area. As most of the areas on which the City deployed DCMs in the period from 2000 through 2006 required high levels of control, both the 1998 and 2003 SIP required 99 percent PM_{10} control effectiveness in all DCM areas. This means that all existing Shallow Flooding areas must be 75 percent wetted in order to be in compliance, except as provided during the "shoulder seasons" described in Section 5.2.3.

However, it is possible that the District's research developed percent-wetted requirements that are conservative and the City's large-scale Shallow Flooding DCMs are being operated with more water coverage than is necessary to provide 99 percent PM_{10} control effectiveness. Therefore, this 2008 SIP contains a provision to "fine tune" the amount of water required for 99 percent control. Two types of refinement tests are provided for: 1) an immediate test on up to 1.5 square miles of existing Shallow Flood area requiring 99 percent PM_{10} control efficiency and 2) a large-scale test that allows annual reductions averaging 10 percent wetness, once a set of preconditions have been met. The detailed procedure for the Shallow Flooding operational refinements are set forth in Attachment D to the Board Order in Chapter 8 ("2008 Procedure for Modifying Best Available Control Measures (BACM) for the Owens Valley Planning Area"). The procedure will be summarized here, but, as with all such descriptions, the actual Board Order takes precedence over the summary.

The Shallow Flooding adjustment procedure allows the City the option of immediately conducting a preliminary wetness cover refinement field test on up to 1.5 square miles of existing Shallow Flooding dust control area that requires 99 percent control. The City must select a test area and prepare a test design for it. The District's Air Pollution Control Officer (APCO) must approve the test area and test design prior to implementation. The City is required to conduct all required environmental analyses and secure all necessary permits and approvals for the test. The City can then use the results of the test as a basis for the larger-scale Shallow Flooding wetness refinements, described below.

In addition to the 1.5 square-mile Shallow Flood wetness cover refinement test discussed above, the City may undertake Shallow Flooding wetness refinements in annual increments averaging 10 percent wetness reduction on a large scale, after the following preconditions have been met:

1. All the DCMs required by this 2008 SIP have been constructed.
2. All the DCMs required by this 2008 SIP have been operational for one full year (365 consecutive days).
3. There have been no monitored exceedances of the PM_{10} NAAQS at or above the historic shoreline caused solely by emissions from the 2008 total DCM area for one full year (365 consecutive days).
4. The City prepares a written wetness cover plan that takes into account the results of the preliminary wetness cover refinement field test described above, as well as the results of the fall and spring “shoulder season” wetness reductions described in Section 5.2.3. The City is required to conduct all required environmental analyses and secure all necessary permits and approvals for the test.
5. The APCO approves the wetness cover plan. (Depending on the location and extent of refinement, CSLC approval may also be required.)

Once the above preconditions have been met, the City will be permitted to implement the wetness cover plan and reduce the wetness cover by an average of 10 percent over the Shallow Flooding areas that require 99 percent control efficiency. If shoreline PM_{10} monitors show any exceedances from anywhere in the Planning Area, no further reductions will be permitted for any Shallow Flooding area that has contributed to any exceedance and wetness increases will have to be made in those areas from which excess PM_{10} emissions originated. If there are no monitored 24-hour PM_{10} values exceeding 130 µg/m³ or modeled PM_{10} values exceeding 120 µg/m³ for one full year after the City has implemented the wetness cover plan, the City may apply to the APCO to further reduce wetness coverage in areas requiring 99 percent control. These adjustments may continue until monitored/modeled PM_{10} values exceed the respective 130/120 µg/m³ limits discussed above.

It should be noted that, for state lands on the Owens Lake bed, the California State Lands Commission may have discretionary authority over modifications to the project description for implementing DCMs, including the above-described operational refinements. However, nothing in this SIP is intended to give any regulatory agency more authority than their authority under law. In addition, operational refinements may require CEQA analysis of the potential environmental impacts, particularly to vegetation and wildlife. The responsibility for all CEQA analyses and all required permits and approvals associated with DCM operational refinements are the responsibility of the City.

5.2.5 Shallow Flooding Compliance Monitoring

Using the required MDCE for each DCM area set forth in Figure 5.7, the MDCE vs. wetness curve set forth in Figure 5.8 and adjusting the required wetness during the spring shoulder season, a minimum wetness value can be determined for all Shallow Flooding DCM areas at any time during the year. The actual wetness coverage for Shallow Flooding areas can be determined by aerial photography, satellite imagery or any other method approved by the APCO (Hardebeck, *et al.*, 1996, Schade, 2001, HydroBio, 2007). Currently the District is using publically available USGS Landsat satellite imagery and a process developed by the District’s remote sensing consultant, HydroBio, to determine the percent wetness for Shallow Flooding areas. Figure 5.9 shows one of the satellite images and Figure 5.10 shows the compliance status for the image date. Figure 5.11 is a detail showing the wet and dry areas on a portion of the satellite image.

The following portions of the areas designated for control with Shallow Flooding are exempted from the wetness coverage requirements:

1) Raised berms, roadways and their shoulders necessary to access, operate and maintain the control measure which are otherwise controlled and maintained to render them substantially non-emissive.
2) Raised pads containing vaults, pumping equipment or control equipment necessary for the operation of Shallow Flooding infrastructure which are otherwise controlled and maintained to render them substantially non-emissive.

"Substantially non-emissive" shall be defined to mean that the surface is protected with gravel or durable pavement sufficient to meet the requirements of District Rules 400 and 401 (visible emissions and fugitive dust).

5.2.6 Shallow Flooding Habitat

When fresh water is distributed across the playa for Shallow Flooding, opportunistic plant species establish themselves where the water has a low salinity creating favorable growing conditions. Limited stands of cattails (*Typha* spp.), sedges (*Carex* spp.), saltgrass (*Distichlis spicata*) and other species associated with saturated alkaline meadows of the region colonized the immediate vicinity of the water outlets on the District's 1993 to 1996 flood irrigation project. However, during the operation of the first phases of the City's Shallow Flood DCMs, recirculated flood waters generally keep the salinity of the water high preventing significant establishment of volunteer vegetation. Based on testing performed by the District at the North Flood Irrigation Project test area and the City's operation of the first phases of Shallow Flooding, naturally established vegetation can be expected to occur on between zero and 0.5 percent of the area that is controlled with Shallow Flooding.

The expansive shallow flooded areas provide ephemeral resting and foraging habitat for wildlife use. Figure 5.12 is a photo of one of the City's Shallow Flooding control areas west of the community of Keeler. Shorebirds can be seen using the wetted area. Shorebird utilization of wet areas on the lake bed was common during the District's control measure testing as well as during the City's operation of the first phases of large-scale Shallow Flooding (Ruhlen and Page, 2001, 2002). Based on these previous experiences, it is anticipated that Shallow Flooding will create large areas of wildlife habitat in areas where very little previously existed.

In addition to desirable plant species, such as those listed above, that may grow and help control PM_{10} emissions, there is the possibility that undesirable non-native plants may invade wet playa areas. Fortunately, the existing saline soil conditions inherent to the lake bed are inhospitable to most plants including exotic pest plants such as tamarisk, puncture weed and Russian thistle and noxious grasses such as *Cenchrus*. The Board Order requires the City to remove all exotic pest and weed plants from the dust control areas. Removal will be accomplished through an appropriate combination of biological, mechanical and chemical control methods. Depending on

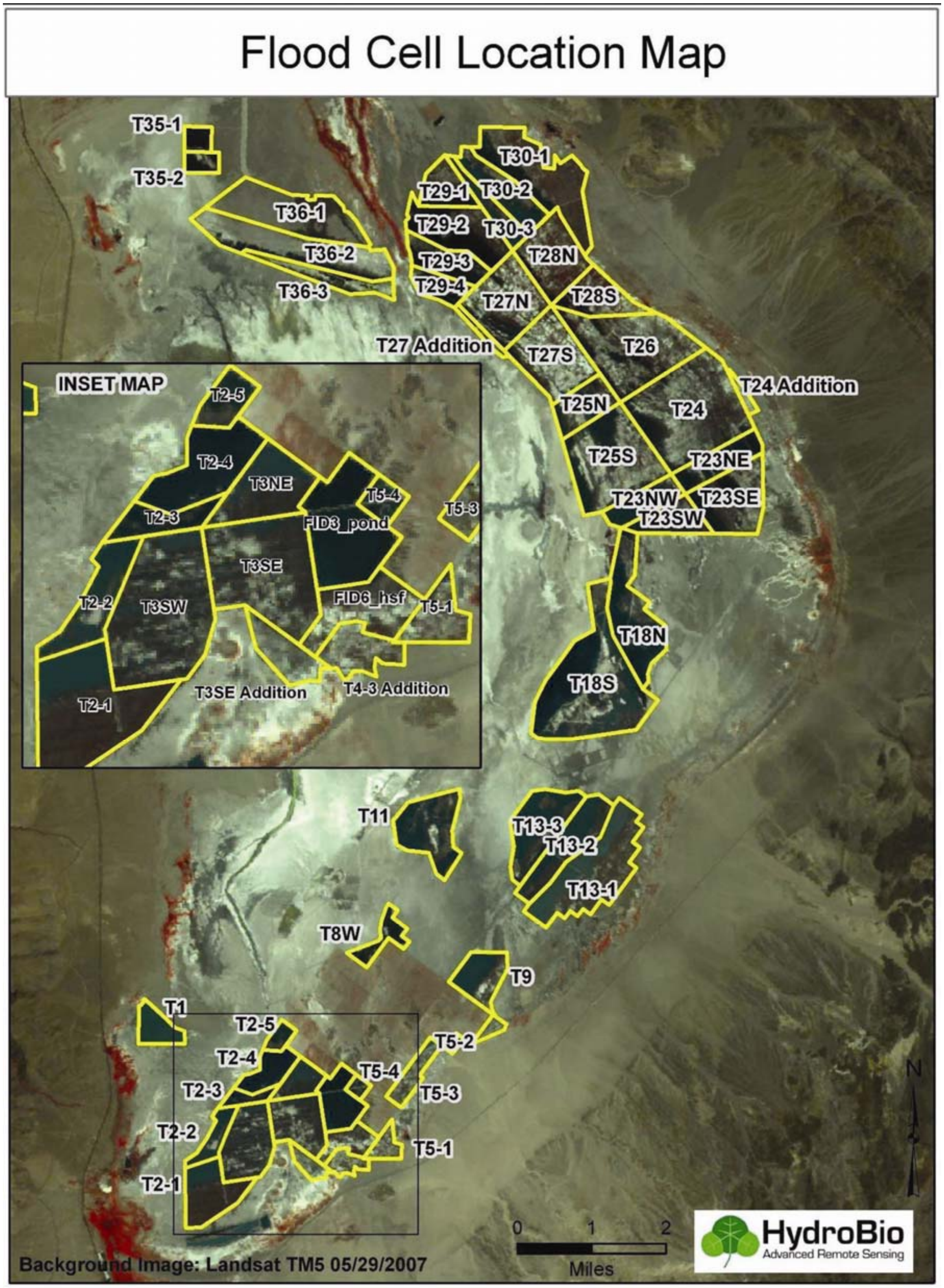

Figure 5.9 – Shallow Flooding satellite image

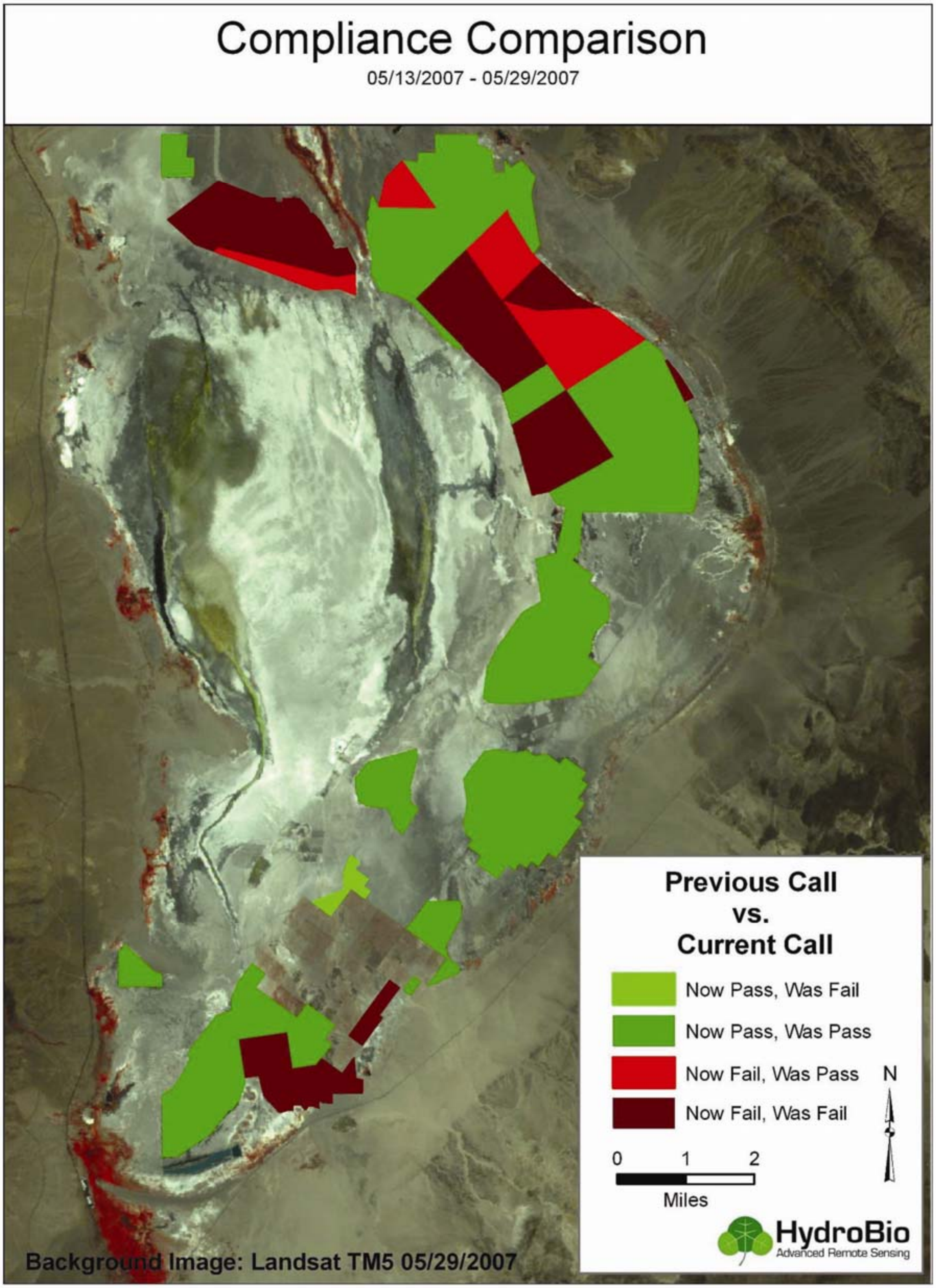

Figure 5.10 – Shallow Flooding compliance status

This view shows the NW region of the Owens Lake with failing cells outlined in red and compliant (wet) pixels shown in blue

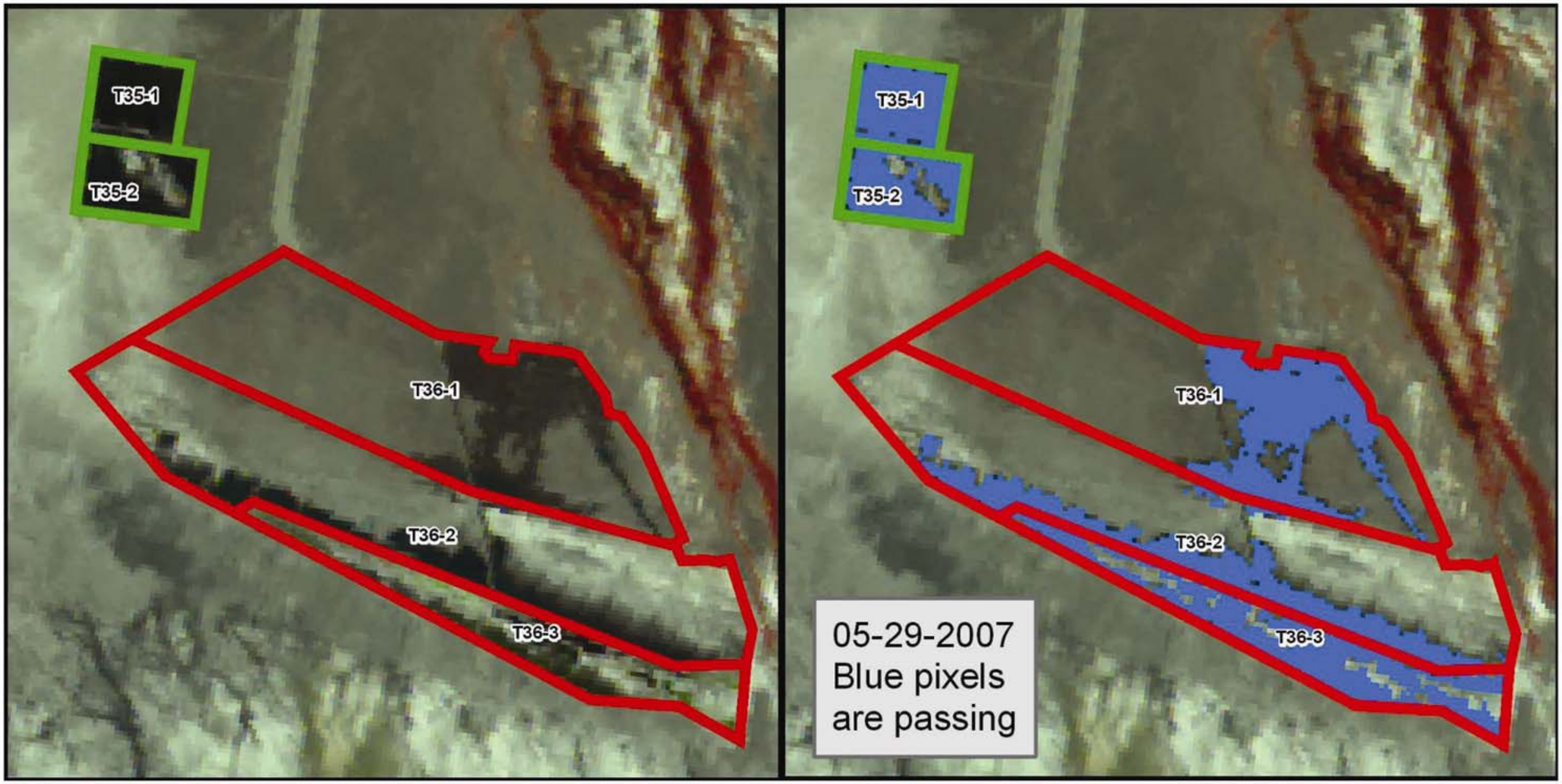

Figure 5.11 – Shallow Flooding compliance detail

Figure 5.12 – Shallow Flooding wildlife

the method of exotic pest and weed plant control selected by the City, the City may need to conduct the appropriate CEQA analysis and secure approval from other responsible agencies, especially the State Lands Commission, for activities on state lands. In addition, a mitigation monitoring program for all potentially significant impacts to wildlife may be required.

Field investigations were performed by mosquito entomologists from the University of California, Davis at District Shallow Flooding test sites and at natural pond, spring and seep areas around Owens Lake to determine the potential for water-based control measures to create mosquito-breeding habitat (Eldridge, 1995). These investigations concluded that mosquito habitat had limited potential to occur on the lake bed, but could occur when water depths range from 2 to 20 inches and when water had essentially no movement.

A mandatory element of this project will be a program to abate mosquito and other pest vector breeding and swarming. Abatement activities may include site design elements to minimize vector breeding habitat, application of pesticides and/or biological controls. These measures are successfully used throughout the Owens Valley. As an alternative to a separate mosquito and pest abatement program, the City of Los Angeles may petition the County of Inyo to annex all water-based control measure areas into the Inyo County Mosquito Abatement Program. If annexation occurs, appropriate assessments may be levied to ensure that abatement activities can take place. In recognition of the location of the source emission control areas in an area that is a stopover location for shorebirds and waterfowl, the mosquito and pest abatement programs shall be designed to minimize the potential impacts on the breeding success of western snowy plovers and other birds that use the playa. Depending on the method of mosquito and pest insect control selected by the City, the City may need to conduct the appropriate CEQA analysis and secure approval from other responsible agencies, especially the State Lands Commission for activities on state lands. In addition, a mitigation monitoring program for all potentially significant impacts to wildlife may be required. All mosquito and pest insect abatement costs shall be the sole financial responsibility of the City.

5.2.7 Shallow Flooding Operation and Maintenance

Water flows between October 15 and June 30 will be maintained to provide the required water coverages in substantially evenly distributed standing water or surface-saturated soil. Based on the City's actual operation of large-scale Shallow Flooding area in 2006 and 2007, operating the Shallow Flooding control measure is predicted to use approximately 3.1 to 4.2 acre-feet per year (ac-ft/yr) of water per acre controlled. Drains installed near naturally occurring wetlands would be operated so as not to cause significant groundwater drawdown or loss of surface water extent in the adjacent areas. The District will continue its program of monitoring water levels and vegetation cover in Owens Lake bed wetlands to ensure installed drains are not adversely impacting existing wetlands.

Maintenance activities associated with Shallow Flooding consist of grading, addition of supplemental water outlets, and berming on the control areas to ensure uniform water coverage and prevention of water channeling. Other activities include regular and preventative maintenance of pipeline, valves, pumping equipment, berms, roads and other infrastructure. Based on District projects and operation of the first phases of Shallow Flooding by the City, staffing requirements for operation and maintenance of the Shallow Flooding areas will be approximately one full-time equivalent employee (FTEE) per 580 acres of flooded area.

5.3 MANAGED VEGETATION

5.3.1 Description of Managed Vegetation for PM_{10} Control

Vegetated surfaces are resistant to soil movement and thus provide protection from PM_{10} emissions. Vegetation that has established 50 percent total surface cover provides a very effective barrier that prohibits wind speeds from reaching the threshold velocity for emissions at the playa surface. Vegetation has naturally become established where water appears on the playa surface with quantity and quality sufficient to leach the salty playa soils and sustain plant growth. Natural saltgrass meadows around the playa margins and the scattered spring mounds found on the playa are examples of such areas (Figure 5.13). Observation of these naturally vegetated areas has shown that very little dust emissions are generated from them. The Managed Vegetation strategy is modeled on these naturally protective saltgrass vegetated areas. Dust control using Managed Vegetation is a mosaic of irrigated fields provided with subsurface drainage that create soil conditions suitable for plant growth using a minimum of applied water. Aerial and ground-level views of existing Managed Vegetation PM_{10} controls constructed by the City are shown in Figures 5.14, 5.15a and 5.15b.

The Managed Vegetation control measure consists of creating a farm-like environment from currently barren playa. The saline soil must first be reclaimed with the application of relatively fresh water, and then planted with salt-tolerant plants that are native to the Owens Lake basin. Thereafter, soil fertility and moisture inputs must be managed to encourage rapid plant development to, and maintenance of, 50 percent cover. Existing Managed Vegetation controls on the lake bed are irrigated with buried drip irrigation tubing and a complex network of buried tile drains capture excess water for reuse on the Managed Vegetation area or in Shallow Flooding areas.

Managed Vegetation is sustainable at Owens Lake only if salt from the naturally occurring shallow groundwater is prevented from rising back into the rooting zone. Leaching and irrigation water applied to the Managed Vegetation serves to create and maintain a gradient of salts down and away from the rooting area of the planted vegetation. A subsurface drainage system is present beneath each Managed Vegetation field and allows collection of irrigation flows and removal of high salinity groundwater so that levels do not rise into the root zones of the established saltgrass. Drain water is pumped from the site and placed into brine storage ponds where it can be recycled and used for Shallow Flooding or for mixing with fresh irrigation water so that the applied water has salinity sufficient to maintain the soil structure as well as irrigate the salt tolerant *Distichlis spicata* (saltgrass). However, depending on local site conditions and compliance requirements, alternative irrigation and drainage configurations, water supply quality, irrigation scheduling regimes, and plant communities may be employed, so long as the essential ground coverage compliance requirements for an approved DCM are achieved. In clay dominated soils irrigation with low-salinity or fresh water can potentially cause a collapse of the soil structure, preventing water infiltration and salt leaching. The City’s existing Managed Vegetation site has a target applied water salinity of approximately 9 decisiemens per meter (a measure of electrical conductivity—seawater has a salinity of about 35dS/m) and requires addition of saline drain water to reach this salinity level. Drains installed near naturally occurring wetlands are operated so as not to cause significant groundwater drawdown or loss of surface water extent in the adjacent wetland areas.

Figure 5.13 – Natural saltgrass meadows on northeast corner of the Owens Lake bed

Figure 5.14 – Managed Vegetation – aerial view

Figure 5.15a – Managed Vegetation – ground level view

Figure 5.15b – Managed Vegetation – equipment pad with sand filters and chemical tanks

The clay soils found on many areas of the lake bed are appropriate for the construction of earthen infrastructure. The native profiles, texture and fractured structure of the clay soil makes it well suited for water distribution and drainage. The lower profiles in clay soils often include a network of existing fractures, facilitating effective drain water collection and natural drainage so that the groundwater does not intrude into the rooting zone. The fine clay particles have a very high pore volume (approximately 50 percent) and therefore retain water for long periods between irrigation events (Stradling, 1997 and Ayars, 1997).

Tests by the District and others have shown that vegetation covers ranging from 11 to 54 percent provide the surface protection necessary for the 99 percent PM_{10} control needed at Owens Lake in order to meet the NAAQS. In order to provide the margin of safety necessary to prevent PM_{10} emissions in all conditions, the District has determined that 50 percent total cover averaged over every acre is an appropriate, conservative prescription for the Managed Vegetation PM_{10} control measure. Total cover includes living plants and any dead plant materials, as both function to prevent PM_{10} emissions. Once the target cover of 50 percent is attained, saltgrass stands can be sustained at or above this level of cover with less than 2.5 acre-feet per year of irrigation water (GBUAPCD, 2002a, 2002c).

The City currently has about 3.5 square miles of Managed Vegetation PM_{10} controls on the lake bed. The Managed Vegetation area is in one contiguous block near the south end of the lake bed. Initial site planting occurred in the summer of 2002 and the City has worked since that time to improve vegetation cover. Although there are portions of the existing Managed Vegetation area that meet the 50 percent cover requirement, the overall site vegetation cover averages about 24 percent. This is well below the SIP requirement of 50 percent vegetation cover on every acre. However, the 3.5 square mile site, as a whole, has achieved a high level of PM_{10} control (Air Sciences, Inc., 2006).

As part of the 2006 Settlement Agreement between the District and the City entered into in December 2006, (Chapter 8, Attachment A, 2006 Settlement Agreement, Paragraph 6) the parties agreed that the existing Managed Vegetation site had achieved a high level of PM_{10} control. They also agreed that the City would prepare an Operation and Management Plan that ensured the site continued to achieve control sufficient to prevent emissions that caused or contributed to NAAQS violations. The Plan is to be approved by the APCO. As long as the City continues to operate and maintain the site such that it meets the Plan's requirements and as long as the site does not cause an exceedance of the NAAQS at the historic shoreline, the District will deem the existing Managed Vegetation site to be in compliance.

The City prepared a draft of the required Managed Vegetation Operation and Maintenance Plan and submitted it to the District prior to the July 1, 2007 deadline set forth in the Settlement Agreement. The Plan will not be approved prior to the adoption of this 2008 SIP, but will be approved by the APCO as expeditiously as possible. The provisions of the Plan only apply to the Managed Vegetation area that was in place and operational prior to January 1, 2007. Any Managed Vegetation dust controls that are constructed after January 1, 2007 must meet the 50 percent cover on every acre requirement.

The following portions of the areas designated for control with Managed Vegetation are exempted from the vegetative cover requirements:

1) portions consistently inundated with water, such as reservoirs, ponds and canals,
2) roadways and equipment pads necessary to access, operate and maintain the control measure which are otherwise controlled and maintained to render them substantially non-emissive, and
3) portions used as floodwater diversion channels or desiltation/retention basins.

"Substantially non-emissive" shall be defined to mean that the surface is protected with gravel, durable pavement or other APCO-approved surface protections sufficient to meet the requirements of District Rules 400 and 401 (visible emissions and fugitive dust).

Percent cover can be measured by the point frame method or via ground-truthed remote sensing technologies such as aerial photography or satellite imagery or by any other method approved by the APCO (Scheidlinger, 1997, Groeneveld, 2002, HydroBio, 2007).

Saltgrass (*Distichlis spicata)* is currently the only plant species approved for introduction into Managed Vegetation fields. Saltgrass is tolerant of relatively high soil salinity, spreads rapidly via rhizomes and provides good protective cover year-round even when dead or dormant. It is adapted to produce its most vigorous growth during the spring and autumn, and then use minimal amounts of applied water during the hot summer. Saltgrass grows vigorously in conditions of soil salinity that exclude invasive pest exotics. Eventually, salt-tolerant, locally native shrubs such as salt bushes (*Atriplex* spp.), greasewood (*Sarcobatus vermiculatus*), and seepweed (*Sueada moquinii*) may be introduced to established saltgrass fields to increase diversity and possibly reduce total water demand. Locally adapted native plant species other than saltgrass may intentionally be planted for dust control only upon approval of both the District and the California State Lands Commission.

5.3.2 PM_{10} Control Effectiveness for Managed Vegetation

Field and wind tunnel research using Owens playa soils and saltgrass indicate that even sparse populations of saltgrass are effective in reducing sand migration and PM_{10} emissions within the stand (Lancaster, 1996, White, *et al.*, 1996, Nickling, *et al.* 1997, White, 1997, Air Sciences, Inc., 2006). Lancaster concluded that for the coarse sands on the northern portion of Owens Lake, a 95 percent reduction in sand movement can be achieved with a saltgrass cover of between 16 to 23 percent, depending on wind speed and direction. White showed that in wind tunnel tests a vegetation cover of 12 to 23 percent will significantly reduce the amount of entrained sand and PM_{10}. Nicking *et al.* showed that on clay soils PM_{10} was reduced by two orders of magnitude from vegetated surfaces as compared to the natural playa surface. Similar PM_{10} reductions were also observed from non-vegetated leached clay soils. This indicates that treatment of the clay surfaces at Owens Lake by watering and leaching surface salts can by itself significantly reduce wind erosion without vegetation. However, saltgrass vegetation cover will provide additional surface protection after evaporation decreases the initial protection provided by surface wetting. In a companion project by White (1997), Owens Lake clay soils planted with saltgrass were subjected to various wind speeds in a wind tunnel at the University of California

Davis. Results indicate that 54 percent vegetation cover reduces the emission rate of PM_{10} at wind speed of 45 mph by 99.2 percent as compared to emissions from the natural playa at Owens Lake. Air Sciences (2006) concluded that the existing Managed Vegetation dust control implemented by the City of Los Angeles on the lake bed controlled sand motion by 99 percent with average vegetation covers of over 20 percent.

Control efficiencies were calculated for Owens Lake clay soils in both the field on natural plant stands and in the laboratory using wind tunnels. The field studies showed 99.5 percent control efficiency with 11 to 23 percent saltgrass cover and the laboratory study demonstrated 99.2 percent control efficiency at 54 percent cover as compared to uncontrolled emissions at Owens Lake. A high control effectiveness for low levels of plant cover in agricultural-type soils is supported by field research performed by Buckley and Grantz, *et al.* in places other than Owens Lake, which indicate that a plant cover of even 30 percent can achieve better than 99 percent reduction of soil erosion (Buckley, 1987; and Grantz, *et al.*, 1995). Based on the Buckley and Grantz field studies, the field studies at Lake Texcoco, near Mexico City, other work relating to PM_{10} emissions and vegetation and studies done at Owens Lake, the District believes that more than 99 percent reduction of soil erosion and PM_{10} will be achieved at Owens Lake with a saltgrass cover of 50 percent. The cover achieved within the Managed Vegetation would include a mix of live, dead and/or dormant stems. This level of cover will be retained with appropriate plant husbandry and irrigation during the growing season. It will function during winter months without irrigation. Table 5.1 summarizes research results regarding vegetation cover and control effectiveness.

5.3.3 Managed Vegetation Habitat

Even if saltgrass is the only plant species that is intentionally introduced to the Managed Vegetation area, other native plant species are expected to establish themselves opportunistically. Native plant species observed on saltgrass test plots include inkweed (*Nitrophila occidentalis*), alkali sacaton (*Sporobolus airoides*), arrowscale (*Atriplex phyllostegia*), cattail (*Typha latifolia*) parry saltbush *(Atriplex parryi*), seablight (*Sesuvium verrucosum*) and stinkweed (*Cleomella sp*.). The species typical of transmontane alkaline meadows elsewhere in the Owens Basin, including sedges (*Scirpus* spp.), greasewood (*Sarcobatus vermiculatus*), and yerba mansa (*Anemopsis californica*) would also be expected to appear where soil leaching is most complete, adding diversity and wildlife habitat value to the fields. Although these species are not yet approved for intentional planting, they are locally-adapted native species and do not need to be removed by the City.

On saltgrass test plots established by the District on the playa, evidence of use by birds, rabbits, mice, kangaroo rats, gophers, foxes, coyotes, and a diverse group of invertebrates has been found. Care must be taken to avoid creating disturbed, highly freshened habitats that facilitate pest vector (e.g., mosquito) or noxious weed (e.g., salt cedar) infestations. The mosquito and salt cedar control programs discussed in Section 5.2.6 would also take place on the Managed Vegetation control measure. The Board Order requires the City to remove all exotic pest plants from the dust control areas. Removal will be accomplished through an appropriate combination of biological, mechanical and chemical control methods.

5.3.4 Managed Vegetation Operation and Maintenance

Water use is highest during the initial stages of development of this measure, in order to leach the root zone soil to a salinity level tolerable to saltgrass. Since the later stages of leaching can be accomplished after planting, the total water input that will be required for the first year of implementation will be at most seven ac-ft/ac. Managed Vegetation will consume up to 2.5 acre feet of fresh or mixed water per irrigated acre once the target cover of 50 percent is reached. The City's existing Managed Vegetation site was established with about 2.5 ac-ft/ac of water and their actual water use (with less than 50% average cover) has been between 1.0 to 1.3 ac-ft/ac per year. Non-irrigated acres used for roads, berms, water infrastructure and water storage will alsouse some water for maintenance of protective (non-emissive) salt-crusted surfaces. The distribution of the water over the entire vegetated area will be irregular, because at any given time some fields will be irrigated for maximum growth while others will receive minimal amounts of water allowing for minimal stand maintenance.

Operation and maintenance activities for Managed Vegetation consists of implementing irrigation and fertilization schedules for the fields and monitoring drainage and vegetation conditions, as are appropriate for any sustainable perennial cropping system. Necessary maintenance will include repair and periodic replacement of water delivery and drainage infrastructure. Based on District projects and actual large-scale implementation of Managed Vegetation by the City, staffing requirements for operation and maintenance are approximately one full-time equivalent employee (FTEE) per 230 acres of vegetated area.

5.4 GRAVEL BLANKET

5.4.1 Description of Gravel Blanket for PM_{10} Control

A four-inch layer of coarse gravel laid on the surface of the Owens Lake playa will prevent PM_{10} emissions by: (a) preventing the formation of efflorescent evaporite salt crusts, because the large pore spaces between the gravel particles disrupt the capillary movement of saline water to the surface where it can evaporate and deposit salts; and (b) creating a surface that has a high threshold wind velocity so that direct movement of the large gravel particles is prevented and the finer particles of the underlying lake bed soils are protected. Gravel Blankets are effective on essentially any type of soil surface.

The District constructed small-scale gravel test plots on the Owens Lake bed that were in place for approximately 17 years and continued to completely protect the emissive surfaces beneath. Gravel placed onto the lake bed surface will be durable enough to resist wind and water deterioration, physical/mechanical/chemical weathering and leaching and, to minimize visual impacts, will be approximately the same color as the existing lake bed. The City installed about 90 acres (0.14 square-miles) of Gravel Blanket on the northern portion of Owens Lake in 2005 from rock taken from the Dolomite gravel quarry. A picture of the large scale Gravel Blanket is shown in Figure 5.16.

Under certain limited conditions of sandy soils combined with high groundwater levels, it may be possible for some of the Gravel Blanket to settle into lake bed soils and thereby lose effectiveness in controlling PM_{10} emissions. To prevent the loss of any protective gravel material into lake bed soils, a permeable geotextile fabric may be placed between the soil and the gravel, where necessary. This will prevent the settling of gravel particles into lake bed soils.

Table 5.1 Summary of studies relating the surface cover of vegetation to percent control of PM_{10} emissions

Reference	Surface Cover Characteristics	Wind Speed	% Control
Air Sciences, Inc., 2006	20% saltgrass cover on Owens Lake clay and sand soils	NA	99%
Buckley, 1987	30% ground cover.	NA	99%
Fryrear, 1994	50% canopy cover.	48 mph	96.3%
Grantz, *et al.*, 1995	31% cover on sandy soil.	NA	99.8%
Lancaster, 1996	16-23% saltgrass cover at Owens Lake on sandy soil.	39 mph	95%
Musick & Gillette, 1990	25% vegetation lateral cover, 19.4 mph threshold on bare surface.[1]	NA	100%
Nickling, *et al.,* 1997	11-30% saltgrass cover at Owens Lake on clay soil.	$\geq$ 45 mph	99.5%[3]
van de Ven, *et al.*, 1989	4-5 inch high stubble, 30 stems/ sq. ft 19.28 mph threshold on bare surface.	NA	100%
White, *et al.*, 1996	12% cover on loose Owens Lake sand in a wind tunnel.	44 mph	97.1%[2]
White, 1997	54% saltgrass cover in wind tunnel at UC Davis in clay soil	45 mph	99.4%[3]

Notes:

[1] Wind speeds are normalized to an equivalent 10 meter wind speed at Owens Lake. This conversion uses the surface boundary layer equation assuming 0.01 cm surface roughness and the free stream speed for a given height if 10 meter wind speeds are not available.

[2] Measured PM_{10} emission reduction in the wind tunnel.

[3] Use uncontrolled PM_{10} = 2.6 x 10^{-3} g/m^2/s (from 1998 SIP (GBUAPCD, 1998a))

Figure 5.16 – Gravel blanket on north end of Owens Lake bed

To prevent pore space infilling and possible capillary rise of emissive salts to the surface, Gravel Blanket areas must be protected from water- and wind-borne soil and dust deposition. The Gravel Blanket should be the last control measure to be installed or graveled areas should be surrounded by non-emissive areas. This will minimize wind-borne depositions into the Gravel Blanket. Gravel areas should also be protected from flood deposits with flood control berms, drainage channels and desiltation/retention basins. The large pore spaces between the coarse gravel particles must be maintained to ensure that the Gravel Blanket will remain an effective PM_{10} control measure for many years.

To attain the required PM_{10} control efficiency, 100 percent of all areas designated for Gravel Blanket must be covered with a layer of gravel four inches thick. All gravel material placed shall be screened to a size greater than ½-inch in diameter. The gravel material shall be at least as durable as the rock from the three sources analyzed in the EIR and EIR Addendum Number 1 associated with the 1998 SIP. The material shall have no larger concentration of metals than found in the materials analyzed in the 1998 EIR. To minimize visual impacts, the color of the gravel material used shall be such that it does not significantly change the color of the lake bed.

5.4.2 PM_{10} Control Effectiveness for Gravel Blanket

A Gravel Blanket forms a non-erodible surface when the size of the gravel is large enough that the wind cannot move the surface. If the gravel surface does not move, it protects finer particles from being emitted from the surface. Gravel and rock coverings have been used successfully to prevent wind erosion from mine tailings in Arizona (Chow and Ono, 1992). The potential PM_{10} emissions from a Gravel Blanket can be estimated using the USEPA emission calculation method for industrial wind erosion for wind speeds above the threshold for the surface (USEPA, 1985). PM_{10} will not be emitted if the wind speed is below the threshold speed.

Based on a minimum particle size of ½ inch, the proposed Gravel Blanket will have a threshold wind speed of more than 90 miles per hour measured at 10 meters (USEPA, 1992, Ono and Keisler, 1996). This wind speed is rarely exceeded in the Owens Lake area. A more typical gust for Owens Lake is around 50 miles per hour.

The proposed four-inch thick Gravel Blanket is intended to prevent capillary movement of salts to the surface. Fine sands and silts that fill in void spaces in the gravel will allow the capillary rise of salts and reduce the effectiveness of a Gravel Blanket to control PM_{10} at Owens Lake. In addition, finer particles will lower the average particle size and lower the threshold wind speed for the surface. Gravel Blanket tests were performed at two sites on Owens Lake starting in June 1986. These tests showed that four-inch thick Gravel Blankets composed of ½ to 1½-inch and larger rocks prevented capillary rise of salts to the surface. Observations of ungraveled test plots in the same area, one with no surface covering and another with local unscreened, unsorted alluvial soil, showed that salts would otherwise rise to the surface (Cox, 1996).

The PM_{10} emissions are expected to be virtually zero for the Gravel Blanket since the threshold wind speed to entrain gravel, and thus PM_{10}, is above the highest wind speeds expected for the area. This will result in 100 percent reduction of PM_{10} from areas that are covered by the Gravel Blanket.

5.4.3 Gravel Blanket Operation and Maintenance

Because fine particles cannot be allowed to cover or significantly infill the gravel, the Gravel Blankets should be the last measure implemented after all adjacent erodible areas are controlled. Once the Gravel Blanket has been applied to the playa, limited maintenance would be required to preserve the Gravel Blanket. The gravel will be visually monitored to ensure that the Gravel Blanket was not filled with sand or dust, or had not been inundated or washed out from flooding.

If any of these conditions were observed over areas larger than one acre, additional gravel will be transported to the playa and applied to the playa surface. The District estimates that operation and maintenance staffing requirements are one FTEE per five square miles of gravel and an average ongoing maintenance amount of gravel of 7,000 cubic yards per square mile per year (this allows for complete gravel replacement once every 50 years).

5.5 MOAT & ROW

5.5.1 Description of Moat & Row for PM_{10} Control

In 2006, during the settlement negotiations between the District and the City over the APCO's determination that additional controls were necessary on Owens Lake beyond the 29.8 square miles required by the 2003 SIP, the City proposed a new Owens Lake PM_{10} control measure known as "Moat & Row." It was the City's intention to develop a control measure that cost less to implement and used less water than the approved BACM controls. The Settlement Agreement that resulted from the 2006 negotiations contains provisions for up to 3.5 square miles of Moat & Row to be constructed in the 2008 SIP control area. (See Board Order, Chapter 8, Attachment A, Paragraph 2.B.) However, Moat & Row is currently only a demonstration measure—it is not an approved BACM control.

The general form of Moat & Row is an array of earthen berms (rows) about 5 feet high above the lake bed surface with sloping sides, flanked on either side by slope-sided ditches (moats) about 4 feet deep. The rows are topped with sand fences up to 5 feet high that increase the effective height of the rows. Figures 5.17 and 5.18 are photographs of the Moat & Row test being conducted by the City. Moats are intended to serve to capture moving soil particles, and rows are intended to physically shelter the downwind lake bed from the wind.

The individual Moat & Row elements are to be constructed in a serpentine layout across the lake bed surface, generally parallel to one another, and spaced at variable intervals, so as to minimize the fetch between rows along the predominant wind directions. The serpentine layout of the Moat & Row array is intended to control emissions under the full range of principal wind directions. Initial pre-test modeling conducted by the City indicates that Moat & Row element spacing will generally vary from 250 to 1000 feet, depending on the surface soil type and the PM_{10} control effectiveness (MDCE) required on the Moat & Row area. See Exhibit 4 of the 2006 Settlement Agreement for conceptual drawings of the Moat & Row measure (2008 SIP Chapter 8, Attachment A).

As mentioned above, the Moat & Row PM_{10} control measure is not a currently-approved BACM. The final form of the Moat & Row PM_{10} control measure will be solely determined by

Figure 5.17 – Moat and Row test – oblique view

Figure 5.18 – Moat and Row test – ground level view

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the City based primarily on modeling and the results of a demonstration project and testing being conducted by the City at two locations on the lake bed. One of the test areas is at the northeast corner of the lake bed in primarily sandy soils and the other is in a central area dominated by clay soils. The two Moat & Row test areas total about 0.5 square mile (310 acres). Testing will be conducted on the lake bed during the 2007-2008 dust season prior to implementation on a large scale before the end of 2009. The final form of the Moat & Row PM_{10} control measure will largely be determined from the results of testing conducted by the City on the lake bed. Final design is subject to test results, required PM_{10} control effectiveness, environmental documentation, permitting, engineering, and monitoring considerations.

Areas of Moat & Row that do not function as designed or that cause or contribute to an exceedance of the federal 24-hour PM_{10} NAAQS will be remediated as specifically provided in the Board Order (Chapter 8, Attachment B, "2008 Owens Valley Planning Area Supplemental Control Requirements Procedure"). In summary, the City will use the results of their 2007-2008 Moat & Row tests to design large-scale implementation of the measure to meet all control requirements. The design will then be implemented on up to a maximum of 3.5 square miles within the 2008 SIP DCM area (See Figure 2.3). If the Moat & Row controls are not effective and contribute to a NAAQS exceedance, the City will be given one chance to improve the Moat & Row controls. If the area that was improved is subsequently the cause of a second NAAQS exceedance, the City is required to convert that area to an approved BACM control.

5.5.2 PM_{10} Control Effectiveness for Moat & Row

The District does not know how effective Moat & Row will be. The testing to be conducted by the City during the 2007-2008 dust season is intended to provide the data necessary for final configuration. However, in order for Moat & Row to be a successful dust control measure and in order for it to be designated as a BACM control at some point in the future, it will be required to attain the MDCEs for those areas on which it is implemented (See Figure 5.7).

It is anticipated that the PM_{10} control effectiveness of Moat & Row could be enhanced by combining it with other approved DCMs or other measures to increase the overall dust control effectiveness. Moat & Row enhancement measures could include the addition of Shallow Flooding and/or Managed Vegetation areas between Moat & Row elements, the addition of more Moats & Rows and/or sand fences to the areas between the initially constructed Moat & Row elements and the application of brine or rock facing to the rows to maintain them in a non-emissive condition. These enhancements would ensure that if significant dust sources (hot spots) develop within these areas, they will be addressed. Moat & Row enhancement activities beyond the scope of that anticipated and described in the EIR for this 2008 SIP would require additional CEQA analysis. As with all DCM implementation on lands under CSLC jurisdiction, enhancement measures on state lands would be subject to approval by the CSLC.

5.5.3 Moat & Row Operation & Maintenance

If the City develops a design for Moat & Row that is effective, in order for it to remain effective, it must be maintained. Moats that lose effectiveness by filling with blown soil must be cleared. Rows that deteriorate due to wind or water erosion must be repaired. Sand fences that top the rows and provide increased effective height must also be maintained. As the District has not tested Moat & Row and as the City has yet to develop its final design, it is unknown what level of maintenance will be required for the measure.

5.5.4 Moat & Row as BACM

If Moat & Row is successfully implemented on the Owens Lake bed and achieves the required minimum dust control efficiencies, the City may apply to the District to designate the measure as BACM. The Board Order contains a procedure for designating new BACM controls (Chapter 8, Attachment D, "2008 Procedure for Modifying Best Available Control measures (BACM) for the Owens Valley Planning Area"). In summary, with regard to Moat & Row, the procedure allows the City to implement up to 3.5 square miles of Moat & Row as a test. If the test area is effective for three years, the City may apply to the District for a SIP revision to designate Moat & Row as BACM. The SIP revision is subject to approvals by the District Governing Board, the California Air Resources Board and the USEPA.

5.6 STORMWATER MANAGEMENT

The bed of Owens Lake is subject to infrequent, but significant flooding, alluvial deposition and fluctuating brine pool levels caused by stormwater runoff flows. In order to protect the PM_{10} control measures installed on the lake bed, as well as the downstream lease holders, the City shall design, install, operate and maintain flood and siltation control facilities. Flood and siltation control facilities shall be designed to provide levels of protection appropriate for the PM_{10} control measures being protected. For example, lake bed areas controlled with Managed Vegetation or Gravel Blanket may require a higher level of flood and siltation protection than areas controlled with Shallow Flooding. Appropriate flood and siltation control facilities shall be integrated into the design and operation of all PM_{10} control measures. All flood and siltation control facilities shall be continually operated and maintained to provide their designed level of protection. All flood and siltation control facilities and PM_{10} control measures damaged by stormwater runoff or flooding shall be promptly repaired and restored to their designed level of protection and effectiveness.

All flood and siltation control facilities shall be designed so as not to cause the existing trona mineral deposit lease area (California State Lands Commission leases PRC 5464.1, PRC 3511 and PRC 2969.1) to be subjected to any greater threat of water inundation and alluvial material contamination than would have occurred under natural conditions prior to the installation of PM_{10} control measures.

5.7 REGULATORY EFFECTIVENESS

Rule effectiveness is a measure of the compliance by the regulated sources with the control measures required under the plan. Since virtually all the PM_{10} emissions in the Planning Area originate from the dry playa of Owens Lake, and since a single operator, the City of Los Angeles, is required to undertake the control measures required under this plan to control those emissions, the District projects a rule effectiveness of 100 percent for the plan's control measures.

The District will enforce the plan's requirements through continual oversight and inspection of the City's efforts to construct, operate and maintain the control measures, and through periodic inspection and monitoring. The plan contains milestones in 2009 and 2010 for construction and operation of the control measures, and test methods for determining the compliance of the City's control strategy implementation with the performance standards required under this plan.

5.8 REFERENCES

Air Sciences, Inc., 2006. Managed Vegetation Control Efficiency Study, Owens Dry Lake, California, prepared for the Los Angeles Department of Water & Power, Los Angeles, California, July 2006.

Ayars, 1997. Ayars, James, Reclamation Studies on Owens Lake Bed Soil Using Controlled Flood Irrigation, Prepared for the Great Basin Unified Air Pollution Control District, Bishop, California, May 2, 1997.

Buckley, 1987. Buckley, R., *The Effect of Sparse Vegetation on the Transport of Dune Sand by Wind*, Nature, 325:426-29, 1987.

Chow and Ono, 1992. Chow, Judith, and Duane Ono, eds., PM_{10} Standards and Non-traditional Particulate Sources, "Fugitive Emissions Control on Dry Copper Tailings with Crushed Rock Armor," Air & Waste Management Association, Pittsburgh, Pennsylvania, 1992.

Cox, 1996. Cox, Jr., Bill, Gravel as a Dust Mitigation Measure on Owens Lake, Great Basin Unified Air Pollution Control District, Bishop, California, October 1996.

Eldridge, 1995. Eldridge, B.F. and K. Lorenzen, Predicting Mosquito Breeding in the Restored Owens Lake, University of California, Davis, California, August 1, 1995.

Fryrear, 1994. Fryrear, Donald W., letter from U.S. Department of Agriculture, Agricultural Research Service, to Ellen Hardebeck, Great Basin Unified Air Pollution Control District, Bishop, California, July 22, 1994.

GBUAPCD, 1996. Great Basin Unified Air Pollution Control District, Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Project Alternatives Analysis, GBUAPCD, Bishop, California, October 23, 1996.

GBUAPCD, 1997. Great Basin Unified Air Pollution Control District, Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Final Environmental Impact Report, GBUAPCD, Bishop, California, July 2, 1997.

GBUAPCD, 1998a. Great Basin Unified Air Pollution Control District, Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan, GBUAPCD, Bishop, California, November 16, 1998.

GBUAPCD, 1998b. Great Basin Unified Air Pollution Control District, Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Final Environmental Impact Report Addendum Number 1, GBUAPCD, Bishop, California, November 16, 1998.

GBUAPCD, 2002a. Great Basin Unified Air Pollution Control District, Saltgrass Meadow Establishment and Maintenance Using Flood Irrigation: Lawrence Clay soil at Owens Lake, California (Draft), GBUAPCD, Bishop, California, 2002.

GBUAPCD, 2002c. Great Basin Unified Air Pollution Control District, Meadow Establishment and Maintenance on the North Sand Sheet at Owens Lake, 1994-2001 (Draft), GBUAPCD, Bishop, California, 2002.

GBUAPCD, 2003. Great Basin Unified Air Pollution Control District, Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan - 2003 Revision, GBUAPCD, Bishop, California, November 13, 2003.

GBUAPCD, 2006b. Great Basin Unified Air Pollution Control District, Settlement Agreement between the District and the City to resolve the City's challenge to the District's Supplemental Control Requirement determination issued on December 21, 2005 and modified on April 4, 2006, GBUAPCD, Bishop, California, December 4, 2006.

GBUAPCD, 2007b. Great Basin Unified Air Pollution Control District, 2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Draft Subsequent Environmental Impact Report, State Clearing House Number 2007021127, GBUAPCD, Bishop, California**,** September 14, 2007.

Grantz, *et al.*, 1995. Grantz, David, David Vaughn, Rob Farber, Mel Zeldin, Earl Roberts, Lowell Ashbough, John Watson, Bob Dean, Patti Novak, Rich Campbell, Stabilizing Fugitive Dust Emissions in the Antelope Valley from Abandoned Farmland and Overgrazing, *A&WMA's 88th Annual Conference & Exhibition*, June 1995, San Antonio, Texas, Paper #95-MP12.04, Air & Waste Management Association, Pittsburgh, Pennsylvania, June 1995.

Groeneveld, 2002. Groeneveld, David G., A Remote Sensing Approach to Monitoring Owens Lake Mitigation, prepared for Great Basin Unified Air Pollution Control District by HydroBio, Santa Fe, New Mexico, 2002.

Hardebeck, *et al.*, 1996. Hardebeck, Ellen, Grace Holder, Duane Ono, Jim Parker, Theodore Schade and Carla Scheidlinger, Feasibility and Cost-Effectiveness of Flood Irrigation for the Reduction of Sand Motion and PM_{10} on the Owens Dry Lake, Great Basin Unified Air Pollution Control District, Bishop, California, 1996.

HydroBio, 2007. HydroBio, Inc., Bibliographic Summary of Owens Lake Dust Control Measure Compliance Reports and Supporting Documentation, Santa Fe, New Mexico, September 2007.

LADWP, 2000. Los Angeles Department of Water and Power, Mitigated Negative Declaration, North Sand Sheet Shallow Flooding Project, Owens Lake Dust Mitigation Program, Owens Lake , California, Los Angeles, California, April 2000.

LADWP, 2001. Los Angeles Department of Water and Power, Mitigated Negative Declaration, Southern Zones Dust Control Project, Owens Lake Dust Mitigation Program, Owens Lake , California, Los Angeles, California, September 2001.

Lancaster, 1996. Lancaster, Nicholas, Field Studies to Determine the Vegetation Cover Required to Suppress Sand and Dust Transport at Owens Lake, Desert Research Institute, Reno, Nevada, July 1996.

Musick & Gillette, 1990. Musick, H.B. and D.A. Gillette, *Field Evaluation of Relationships between a Vegetation Structural Parameter and Sheltering Against Wind Erosion*, Journal of Land Degradation and Rehabilitation, December 1990.

Nickling, *et al.*, 1997. Nickling, William G., Nicholas Lancaster, and John Gillies, Field Wind Tunnel Studies of Relations Between Vegetation Cover and Dust Emissions at Owens Lake, an interim report prepared for the Great Basin Unified Air Pollution Control District, University of Guelph, Ontario, Canada, and Desert Research Institute, Reno, Nevada, May 8, 1997.

Ono and Keisler, 1996. Ono, Duane and Mark Keisler, Effect of a Gravel Cover on PM_{10} Emissions from the Owens Lake Playa, Great Basin Unified Air Pollution Control District, Bishop, California, July 1996.

Ruhlen and Page, 2001. Ruhlen, T.D. and G.W. Page, Summary of Surveys for Snowy Plovers at Owens Lake in 2001, report prepared for CH2MHILL, Santa Ana, California, 2001.

Ruhlen and Page, 2002. Ruhlen, T.D. and G.W. Page, Summary of Surveys for Snowy Plovers at Owens Lake in 2002, report prepared for CH2MHILL, Santa Ana, California, 2002.

Schade, 2001. Schade, Theodore, Procedure to Determine Compliance with SIP Performance Criterion for Shallow Flood Dust Control Measure, Great Basin Unified Air Pollution Control District, Bishop, California, November 2001.

Scheidlinger, 1997. Scheidlinger, Carla, Vegetation as a Control Measure, Great Basin Unified Air Pollution Control District, Bishop, California, May 1997.

Stradling, 1997. Stradling, Frank, Agrarian Test Area Construction Costs Summary, Agrarian Research & Management Company, Provo, Utah, January 1997.

USEPA, 1995. United States Environmental Protection Agency, Compilation of Air Pollution Emission Factors AP-42 (Fifth edition), USEPA, Research Triangle Park, North Carolina, January 1995.

USEPA, 1992. United States Environmental Protection Agency, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, EPA-450/2-92-004, USEPA, Research Triangle Park, North Carolina, September 1992.

van de Ven, *et al.*, 1989. Van de Ven, T.A.M., D.W. Fryrear, W.P. Spaan, *Vegetation Characteristics and Soil Loss by Wind*, Journal of Soil and Water Conservation, Soil and Water Conservation Society, July-August 1989.

White, *et al.*, 1997. White, Bruce, Victoria M.-S. Tsang, Greg Hyon-Mann Cho, Final Report UC Davis Wind Tunnel A Wind Tunnel Study to Determine Vegetation Cover Required to Suppress Sand and Dust Transport at Owens (dry) Lake, California, Contract No. C9464, prepared for the California State Lands Commission and the Great Basin Unified Air Pollution Control District, Davis, California, February 1997.

White, 1997. Pers. Comm. with Bruce White, University of California Davis; and Carla Scheidlinger, Great Basin Unified Air Pollution Control District, regarding wind tunnel test results, GBUAPCD, Bishop, California, May 13, 1997.

CHAPTER 6

Air Quality Modeling

FIGURES

6

Air Quality Modeling

6.1 INTRODUCTION

An air quality model was used to help identify air pollution sources that contributed to PM_{10} violations, and to evaluate control strategies to bring the area into attainment. The CALPUFF modeling system was selected for use in the Owens Valley State Implementation Plan (SIP). CALPUFF is an approved United States Environmental Protection Agency (USEPA) guideline model that is used for evaluating SIP control strategies and for other regulatory purposes (Scire, *et al.*, 2000). It was previously used to support the attainment demonstration in the 2003 Owens Valley PM_{10} SIP (2003 SIP). The modeling analysis contained in this SIP revision updates the 2003 SIP modeling studies with more recent observations collected from July 2002 to June 2006. This section describes the sources of data that were used to support the CALPUFF model and explains how the model was run. Further details are provided in the Modeling Report included in this 2008 SIP as Appendix B.

The model is an important tool that is used to help quantify the PM_{10} impacts caused by dust source areas at Owens Lake. Data to support the air quality model are collected as part of the Owens Lake Dust Source Identification (Dust ID) Program. The Dust ID Program is a long-term monitoring program that is intended to identify dust source areas for control under the provisions of the Supplemental Control Requirements (SCR) in the 2003 SIP and the 2006 Owens Lake Settlement Agreement entered into between the District and the City on December 4, 2006 (Settlement Agreement) (GBUAPCD, 2006b).

In the modeling analysis emissions from individual dust source areas are simulated to assess whether they caused or contributed to an exceedance or violation of the National Ambient Air Quality Standards (NAAQS) for PM_{10}. The Owens Valley planning area is currently designated as a federal nonattainment area for the 24-hour PM_{10} standard, which is set at 150 $\mu g/m^3$. Attainment of the 24-hour PM_{10} NAAQS is achieved when predicted concentrations are not above 150 $\mu g/m^3$ more than once per year on average. In the current study, the model attainment demonstration is performed for a four-year period with special attention to receptors locations that are at or above the 3,600 foot contour of Owens Lake.

6.2 OVERVIEW OF THE DUST ID PROGRAM

The District started a field monitoring program at Owens Lake in January 2000 to identify PM_{10} emission source areas, and to estimate their PM_{10} emissions and impacts on air quality at the shoreline. The data used in the 2008 SIP was collected during July 2002 through June 2006 using the methods described in the Owens Lake Dust ID Field Manual (GBUAPCD, 2007). The field program was designed based on previous observations and field studies that suggest PM_{10} emissions are related to the flux of saltating sand-sized particles.

Figure 6.1 is a map of Owens Lake showing the locations of the meteorological and PM_{10} monitoring stations. Figure 6.2 shows the locations of the sand flux monitoring network for the period from July 2005 through June 2006. Features of the Dust ID Program are as follows:

- Co-located Sensits and Cox Sand Catchers (CSCs) were used to estimate hourly sand flux rates at each lake bed monitor site shown in Figure 6.2. Sensits measure the kinetic energy and the particle counts of sand-sized particles as they saltate (bounce) across the surface. CSCs are passive instruments used to collect sand-sized particles blown across the surface during a dust event. For a given period, the total mass of saltating sand was based on the CSC catch. The Sensits were then used to time-resolve the horizontal sand flux (Ono, *et al*., 2003a, Gillette, *et al.*, 2004).
- Hourly PM_{10} concentration data were collected at seven sites around Owens Lake using Tapered Element Oscillating Microbalance (TEOM) PM_{10} monitors. TEOMs are a USEPA-designated equivalent method for measurement of PM_{10} concentration.
- Hourly surface meteorological data were collected at 13 District stations within the domain shown in Figure 6.1. These data were augmented by an additional two District sites south of the domain and up to three sites operated by the City during periods of the four year study.
- A 915 MHz Radar Wind Profiler and Radio Acoustic Sounding System (RASS) were used to collect upper level wind and temperature measurements. The Wind Profiler was located at the Mill Site until it was removed during June 2004.
- To help verify the location of dust source areas, time-lapse video cameras were installed at three sites to continuously record dust events during daylight hours and three human observers mapped dust source areas and plumes during the storms on regular workdays. In addition, the erosion boundaries of some source areas were mapped with the aid of a field crew using a Global Positioning System (GPS) after a storm.

A large Geographic Information System (GIS) database was constructed using observations collected during the Dust ID Program. Using the GIS database, the District prepared maps displaying hourly sand movement, winds, visually observed plume and source area boundaries, and PM_{10} concentrations for dust events at Owens Lake during the study period. Owens Lake Dust ID Field Manual provides further detail (GBUAPCD, 2007).

6.3 DISPERSION MODELING TECHNIQUES

The CALPUFF modeling system was selected for assessing source contributions to observed PM_{10} concentrations and for the development of control strategies for the 2008 SIP. CALPUFF is the USEPA recommended modeling approach for long-range transport studies (40 CFR Part 51, Appendix W). USEPA also recommends application of the modeling system on a case-by-case basis to near-field dispersion problems where the three-dimensional qualities of the wind field are of interest. Observations during the Dust ID Program indicate dust events on Owens Lake are sometimes influenced by complex wind patterns, with plumes from the North Sand Sheet traveling in different directions than plumes from the South Sand Sheet. Both CARB and the USEPA approved the application of CALPUFF during their review of the modeling protocol for the 2003 SIP.

6.3.1 Preparation of the Meteorological Data

Three-dimensional wind fields for CALPUFF were constructed from surface and upper air observations using the CALMET meteorological preprocessor program. CALMET combines surface observations, upper air observations, terrain elevations, and land use data into the format required by CALPUFF. In addition to specifying the three-dimensional wind field, CALMET also estimates the boundary layer parameters used to characterize diffusion and deposition by the CALPUFF dispersion model.

The model domain shown in Figure 6.3 is a 34 km-by-48 km (21 by 30 mile) area centered on Owens Lake. The extent of the model domain was selected to include the "data rich" study area, terrain features that act to channel winds, and receptor areas of interest. The meteorological grid used a one-kilometer horizontal mesh size with ten vertical levels ranging geometrically from the surface to four kilometers aloft.

The majority of the necessary surface meteorological data came from the District's network of ten-meter towers shown in Figure 6.1 and two District stations south of the domain. In addition to the District's network, surface data from the City's field programs at Owens Lake were used when available. Cloud cover and ceiling height observations were also obtained from the Bishop Airport and China Lake. Cloud cover is a variable used to estimate the surface energy fluxes and, along with ceiling height, is used to calculate the Pasquill stability class (a classification of atmospheric stability).

The upper air data for construction of the wind fields and estimation of mixing heights with CALMET included local hourly observations from the Mill Site Wind Profiler and regional twice-daily upper air soundings from Desert Rock Airport (Mercury, Nevada) and China Lake Naval Air Station. The Wind Profiler with RASS samples wind and temperature from 300 ft, up to 15,000 ft with a vertical resolution as low as 200 ft. The Wind Profiler data were used until the instrument was removed in June 2004.

The China Lake and Desert Rock twice daily soundings were used to extend the profiles aloft near the profiler and, following removal of the Wind Profiler, for upper level temperature lapse rates. Upper level winds within the domain depend on either actual Wind Profiler measurements or extrapolation of the local surface wind measurements using the wind profile characteristics derived from the Wind Profiler studies

6.3.2 PM_{10} Emissions and Source Characterization

This section provides an overview of the methods discussed in Section 4.3, which were used to calculate hourly wind-blown PM_{10} emissions for dispersion model simulations at Owens Lake. PM_{10} emission fluxes from source areas at Owens Lake were calculated using hourly sand flux activity data and the following simple relationship:

Equation 6.1

$$PM_{10} = K_f \times q$$

Where:

PM_{10} = the vertical PM_{10} emission flux ($g/cm^2/hr$)
K_f = an empirical constant (referred to as the K-factor)
q = the horizontal sand flux measured at 15 cm above the surface ($g/cm^2/hr$)

Field data at Owens Lake suggest the horizontal sand flux at a single measurement height is proportional to the total horizontal sand flux and is a good indicator of wind erosion processes generating PM_{10} emissions. The total horizontal sand flux is a strong function of both the surface shear stress and the properties of the soil at the time of the event. Rather than trying to predict the horizontal sand flux using wind speed and properties of the soil, sand movement on the lake was parameterized using the network of paired Sensit and CSC measurements.

Experimental and theoretical evidence suggest K_f is a property associated with the binding energies of the soil and is relatively independent of the surface stress induced by wind speed. On Owens Lake this empirical constant appears to vary by season, due to the presence or absence of protective salt crusts, and by source areas grouped together by surface soil textures. In the Dust ID Program K_f was inferred using the modeling practices described by Ono, *et al*. (2003a). Simulations were performed using a first guess for K_f and the measured hourly sand flux data. Following a screening analysis, predictions were then compared to observed PM_{10} concentrations and a revised estimate for K_f was obtained. The screening criteria were selected to ensure a strong relationship existed between the source area and the downwind PM_{10} monitoring site. The source-to-receptor relationship was established using wind direction data, sand flux data for the source area, the maps generated from visual observations, and source contribution matrices based on the modeling.

The screened estimates for K_f were then grouped together by period and source area. Four K-factor areas were selected based on common surface soil properties. These source areas are identified as: the Keeler dunes, North area, Central area and the South area (see the maps in Figures 4.3 and 4.4). The periods were subjectively based on inspection of the variability exhibited in time series plots and considerations of the precipitation-temperature history thought to affect surface crusting, surface erodibility, and the formation of efflorescent salts on the surface. For each period and source area with nine or more hourly K_f estimates remaining after the screening process, a revised K_f was derived based on the 75th percentile of the ensemble. During periods and for source areas where nine data pairs were not available, the seasonal 2003 SIP K_f defaults for the areas were used

Table 4.1 lists the K_f estimates used in the 2008 SIP from the data collected during the four year period and the methods outlined above. Figures 4.10 through Figure 4.13 show the temporal variability of the K_f estimates assigned to each of the four general source areas. The hourly K_f plots show the seasonality of the data and provide an indication of the uncertainty of the estimates used in the 2008 SIP.

The CALPUFF simulations at Owens Lake are sensitive to source area configuration. Emissions were varied hourly according to Equation 6.1. The paired Sensit and CSC measurements were assumed to be representative of the horizontal sand flux for irregularly shaped source areas near the sand flux site. The following general rules were used to characterize and map source areas on the lake bed:

- Actual source boundaries were used when available to delineate emission sources in the simulations. Actual source boundaries were determined using a weight-of-evidence approach considering visual observations, GPS mapping, and surface erosive characteristics. Erosive characteristics that were considered when defining a source boundary include properties of the soil, surface crusting, wetlands, and the proximity of the brine pool.
- Source boundaries were also defined based on the DCM locations. For example, sand flux measurements outside the DCM were assumed to apply up to the boundary of the DCM. Sand flux measurements inside the DCM were assumed to apply to the area inside the DCM.
- Source areas were represented by a series of rectangular cells that generally conform to the actual shape of the source area and share the same hourly sand flux rates as the sand flux site representing that source area. Smaller rectangles were used as the active areas became smaller during the study period and in some instances near the shoreline to better represent source areas where predicted concentrations are expected to be particularly sensitive to the source area configuration.

Figure 6.4 shows the annual source configurations used in the 2008 SIP attainment demonstration for the period from July 2005 through June 2006. The location, size, Sensit, and general source area assignments for each source cell during the four annual periods are shown in Appendix B. The number of individual sources simulated varied from 1500 to over 2000 depending on the year of the simulation. The total simulated area ranged from 77 to 130 square kilometers.

With the exception of the Keeler dunes, PM_{10} emissions from non-Owens Lake PM_{10} windblown sources are not included in the model as individual sources. Due to the difficult nature of accurately estimating emissions from these much smaller, sporadic sources, non-Owens Lake PM_{10} emissions are included as contributors to the background concentration (see Section 6.3.4). This also includes contributions from upwind sources that may be outside the modeling domain.

6.3.3 CALPUFF Options and Application

The application of CALPUFF involves the selection of options controlling dispersion. Although the simulations are primarily driven by the meteorological data, emission fluxes, and source characterization, the dispersion options also affect predicted PM_{10} concentrations. In this study, the following options were selected for the simulations:

- Dispersion according to the conventional Pasquill-Gifford dispersion curves.
- Near-field puffs modeled as Gaussian puffs, not elongated “slugs.
- Consideration of dry deposition and depletion of mass from the plume.

Dry deposition and subsequent depletion of mass from the dust plumes depend on the particle size distribution. Several field studies have collected particle size distributions within dust plumes at Owens Lake. Based on results from Niemeyer, the CALPUFF simulations assumed a lognormal distribution with a geometric mean diameter of 3.5 μm and a geometric standard deviation of 2.2 (Niemeyer, *et al.*, 1999). These variables are based on the average of 13 dust plume size distributions reported by Niemeyer between June 1995 and March 1996 at different locations within the Airshed.

6.3.4 Background PM_{10} Concentrations

The dispersion model simulations include only wind-blown emissions from the source areas with sand flux activity shown in Figure 6.4 and in Appendix B. During high wind events other local and regional sources of fugitive dust also contribute to the PM_{10} concentrations observed at the monitoring locations. A constant background concentration of 20 $\mu g/m^3$ was added to all predictions to account for background sources. The constant background was calculated from the average of the lowest observed PM_{10} concentrations for each dust event when 24-hour PM_{10} concentrations at any of the sites were above 150 $\mu g/m^3$. To avoid including impacts from lake bed dust source areas in the background estimate, the procedures used a simple wind direction filter to exclude hours when the lake bed may have directly influenced observed PM_{10} concentrations. Such hours were removed and daily average background concentrations were recalculated based on the remaining data (Ono, 2002).

6.4 ATTAINMENT DEMONSTRATION

The CALPUFF modeling techniques described in previous sections and in Appendix B were applied to assess control strategies proposed for the 2008 Owens Valley PM_{10} SIP. These control strategies are described in Chapters 7 and 8. This section of the report describes the methods used to demonstrate attainment of the 24-hour PM_{10} NAAQS and presents the results of the analysis.

PM_{10} emissions were simulated using the hourly sand flux data collected during July 2002 through June 2006 based on the area source configuration shown in Figure 6.4 and Appendix B. The characterization of PM_{10} emissions follows the general techniques discussed above described more fully in Section 4.3.

Emissions from the Keeler dunes were excluded from the simulations to assess attainment. The District believes emissions from the Keeler dunes and several other off-lake sources are primarily caused by deposition from the lake bed sources. As discussed in more detail in Section 7.5, the District will work with the City and other federal, state and local agencies to develop a plan to control dust emissions from the Keeler dunes. Any PM_{10} control measures necessary for the Keeler dunes will be implemented by or before December 31, 2013 in order to demonstrate attainment of the federal standard by 2017.

The influence of non-lake bed sources is included in the simulations through the use of a background concentration. As discussed in Section 6.3.4, a background concentration of 20 $\mu g/m^3$ was added to all model predictions.

Attainment of the NAAQS was assessed using concentration predictions at the historic shoreline in addition to receptors at the monitoring stations. Attainment of the 24-hour NAAQS is achieved when the fifth highest 24-hour PM_{10} concentration in four years at each receptor is less than 150 $\mu g/m^3$. Predictions were obtained at more than 460 receptor locations placed at the historic shoreline (approximately at the 3600 foot elevation) of Owens Lake.

6.4.1 Control Strategy Analysis

The control strategy assessed in this study was developed as part of the 2006 Settlement Agreement between the District and the City. The location of 2003 SIP DCAs and the additional areas for control from the Settlement Agreement are shown in Figure 7.1. The 2003 SIP attainment demonstration evaluated controls for the existing DCAs. The Supplemental Dust Control Areas were identified through the Supplemental Control Requirement provision of the 2003 SIP. The 2008 SIP attainment demonstration evaluates these additional areas: Channel Areas, Supplemental DCAs, and Study Areas.

For the 2008 SIP and the controls in the 2006 Settlement Agreement, the City developed a customized spreadsheet containing the source-receptor contributions for every predicted concentration greater than 50 $\mu g/m^3$. Control efficiencies were assigned based on control type, but allowed to vary within certain DCAs. The spreadsheet starts with the controls specified in the 2003 SIP and then adds controls to new areas identified in the Settlement Agreement. These additional areas begin with no control and then are repetitively increased until all shoreline receptors are predicted to have PM_{10} concentrations less than 150 $\mu g/m^3$. The District then checks the resulting set of controls by re-applying the CALPUFF modeling system.

Control efficiencies for the 2008 SIP attainment demonstration are discussed in Section 7.3. Areas with variable levels of control in the Settlement Agreement are shown in Figure 7.2. These same efficiencies were used in the 2008 attainment demonstration, except for the Study Areas (S1, S2, S3, and S4 in Figure 7.1). The Study Areas were assumed to have no controls as none are required by the Settlement Agreement.

PM_{10} emissions from the Keeler dunes (see discussion above) and the 2003 SIP DCAs were not considered in the 2008 attainment demonstration. Dust control measures were not fully implemented in the 29.8 square mile 2003 SIP DCAs during the modeling period from July 2002 through June 2006. Thus it was not known whether emissions from these areas would be representative of future controlled conditions. For the purpose of the 2008 SIP to establish control levels for the supplemental DCAs in the Settlement Agreement, it was assumed that no emissions were coming from the 2003 DCAs. Controls for these 2003 SIP DCAs were considered in the 2003 attainment demonstration.

6.4.2 Attainment Demonstration Results

The predicted fifth highest 24-hour PM_{10} concentrations at receptors located along the shoreline are shown in Figure 6.5 based on a CALPUFF simulation of the control strategy discussed above. The numbers of times the PM_{10} predictions are above 150 $\mu g/m^3$ at shoreline receptors are displayed in Figure 6.6**.** Although four predictions are above the 24-hour NAAQS, the design or fifth highest concentration at the same receptor was 147 $\mu g/m^3$ for the four-year simulation. The modeling analysis demonstrates attainment of the 24-hour PM_{10} NAAQS using the Settlement Agreement control strategy.

The highest concentrations are along the shoreline at locations influenced by the Study Areas. These areas are being investigated, but there are currently no plans to control these areas. The Study Areas have relatively high emissions for a few days in the four-year simulations.

However, the frequency of such events from these areas is not high enough to cause violations of the 24-hour PM_{10} NAAQS.

6.5 REFERENCES

GBUAPCD, 2006b. Great Basin Unified Air Pollution Control District, Settlement Agreement between the District and the City to resolve the City's challenge to the District's Supplemental Control Requirement determination issued on December 21, 2005 and modified on April 4, 2006, GBUAPCD, Bishop, California, December 4, 2006.

GBUAPCD, 2007a. Great Basin Unified Air Pollution Control District, Owens Lake Dust ID Field Manual. GBUAPCD, Bishop, California, January 24, 2007.

Gillette, *et al*., 2004. Gillette, Dale, Duane Ono, Ken Richmond, *A Combined Modeling and Measurement Technique for Estimating Wind-Blown Dust Emissions at Owens (dry) Lake*, *CA,* Journal of Geophysical Research, Volume 109, January 17, 2004.

Niemeyer, *et al*., 1999. Niemeyer, T.C., D.A. Gillette, J.J. Delisui, Y.J. Kim, W.F. Niemeyer, T. Ley, T.E. Gill, and D. Ono, *Optical Depth, Size Distribution and Flux of Dust from Owens Lake, California*, Earth Surfaces Processes and Landforms, 24: 463-479, 1999.

Ono, 2002. Ono, Duane, Memo on Owens Lake Background PM_{10} Calculation Method, Great Basin Unified Air Pollution Control District, Bishop, California, September 13, 2002.

Ono, *et al*., 2003a. Ono, Duane, Ellen Hardebeck, Scott Weaver, Billy Cox, Nikolai Barbieri, William Stanley, Ken Richmond, and Dale Gillette, Locating and Quantifying Wind-Blown Dust PM_{10} Emissions at Owens Lake, California, *A&WMA's 96th Annual Conference & Exhibition*, June 2003, San Diego, California, Paper #69487, Air & Waste Management Association, Pittsburgh, Pennsylvania, June 2003.

Scire, *et al*., 2000. Scire, J.S.; Strimaitis, D.G.; Yamartino, R.J. A User's Guide for the CALPUFF Dispersion Model (Version 5). Earth Tech, Inc., 196 Baker Avenue, Concord, MA 01742, January 2000.

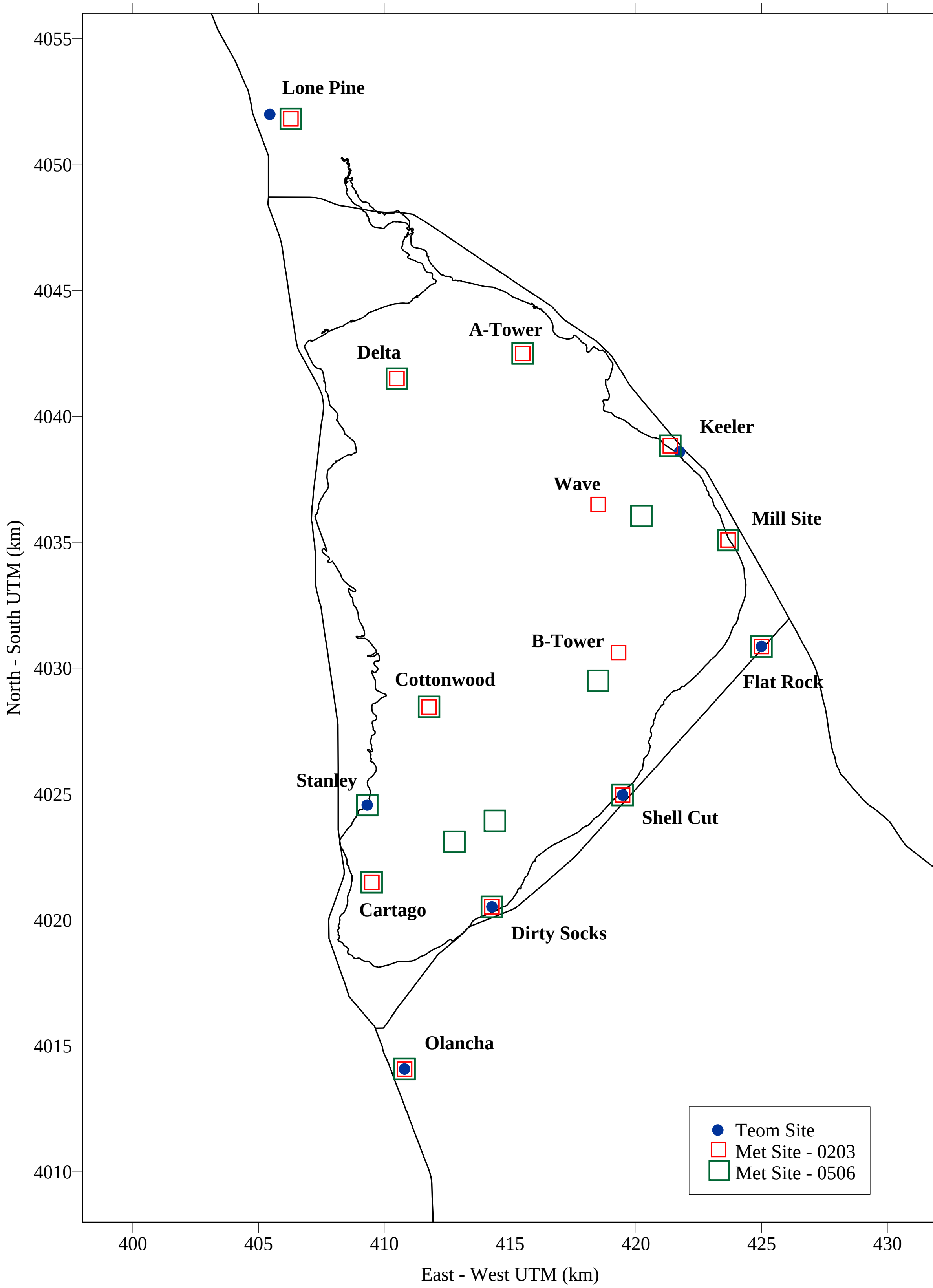

Figure 6.1 - Owens Lake PM_{10} and meteorological monitoring network

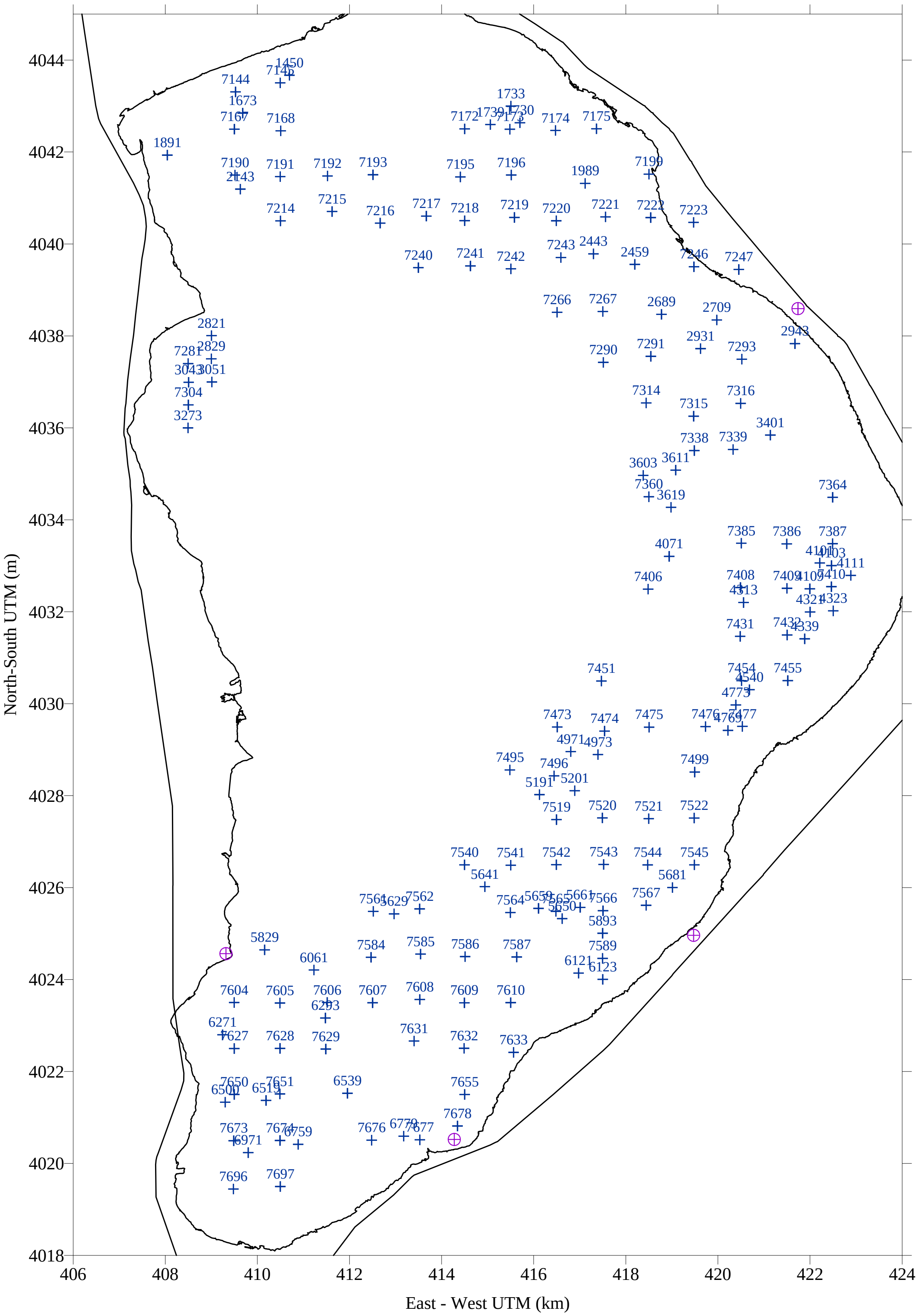

Figure 6.2 - Owens Lake sensit network for July 2005 through June 2006

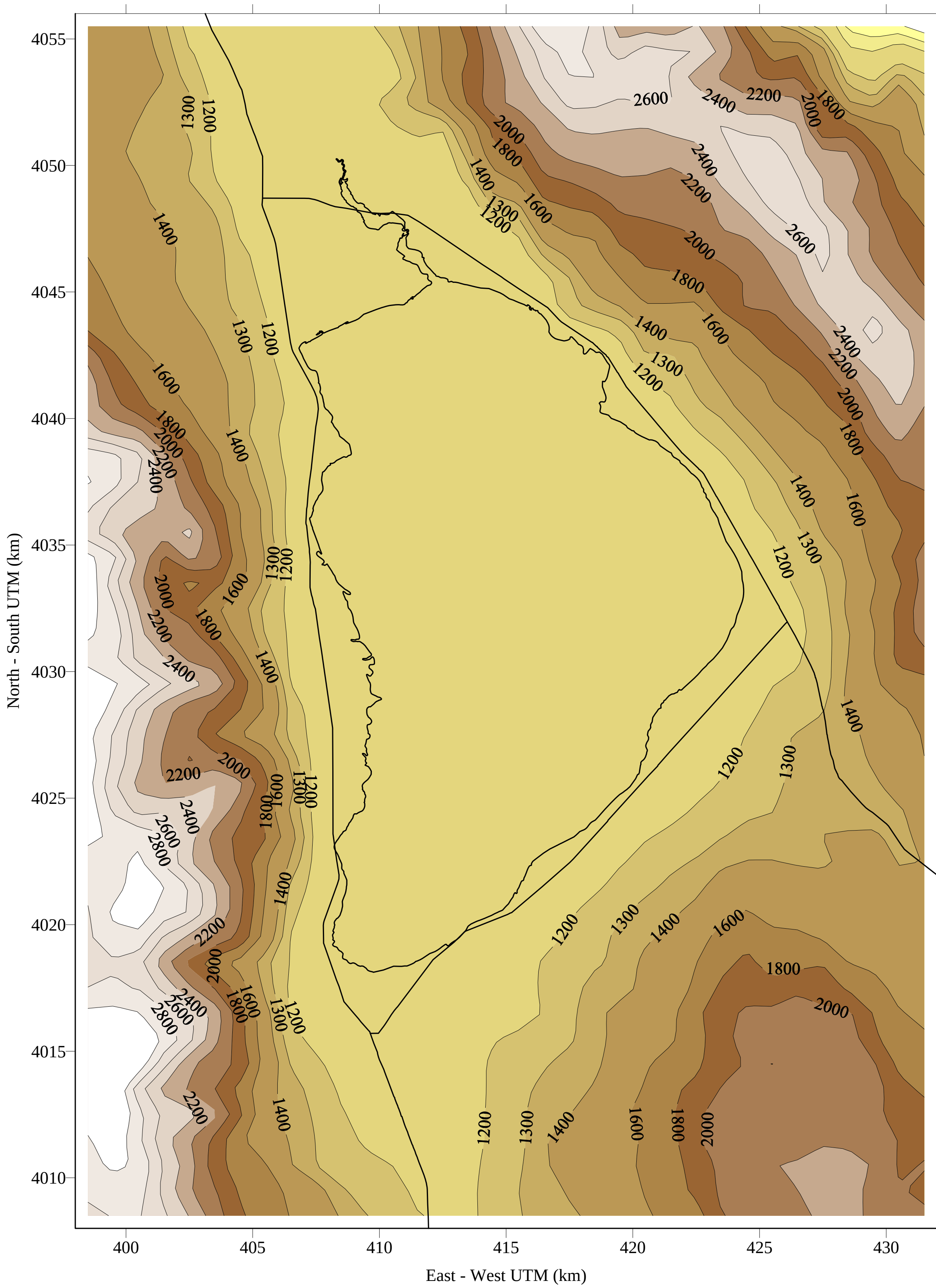

Figure 6.3 - Model domain and one-km mesh size terrain (m)

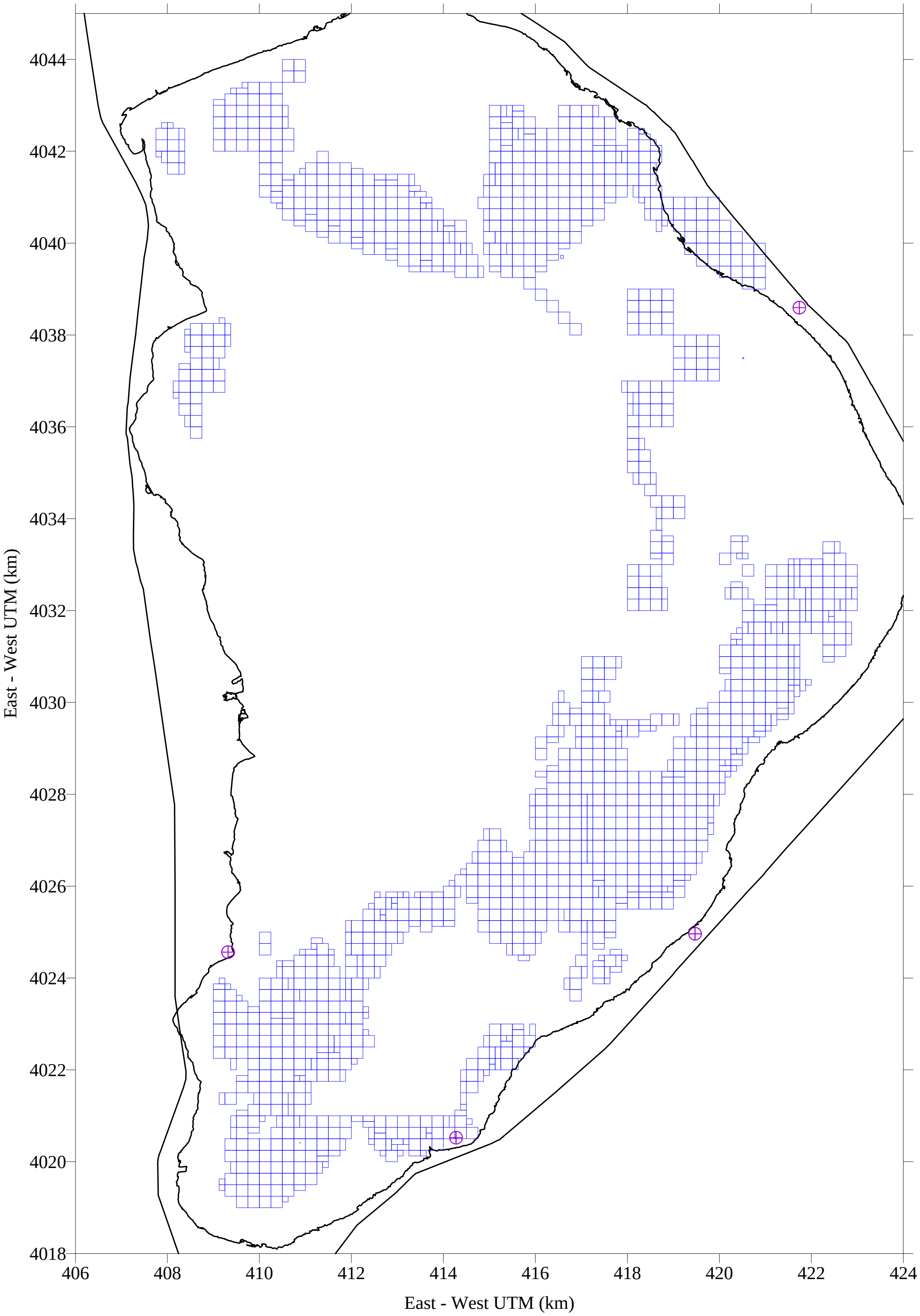

Figure 6.4 - Area source configuration for July 2005 through June 2006

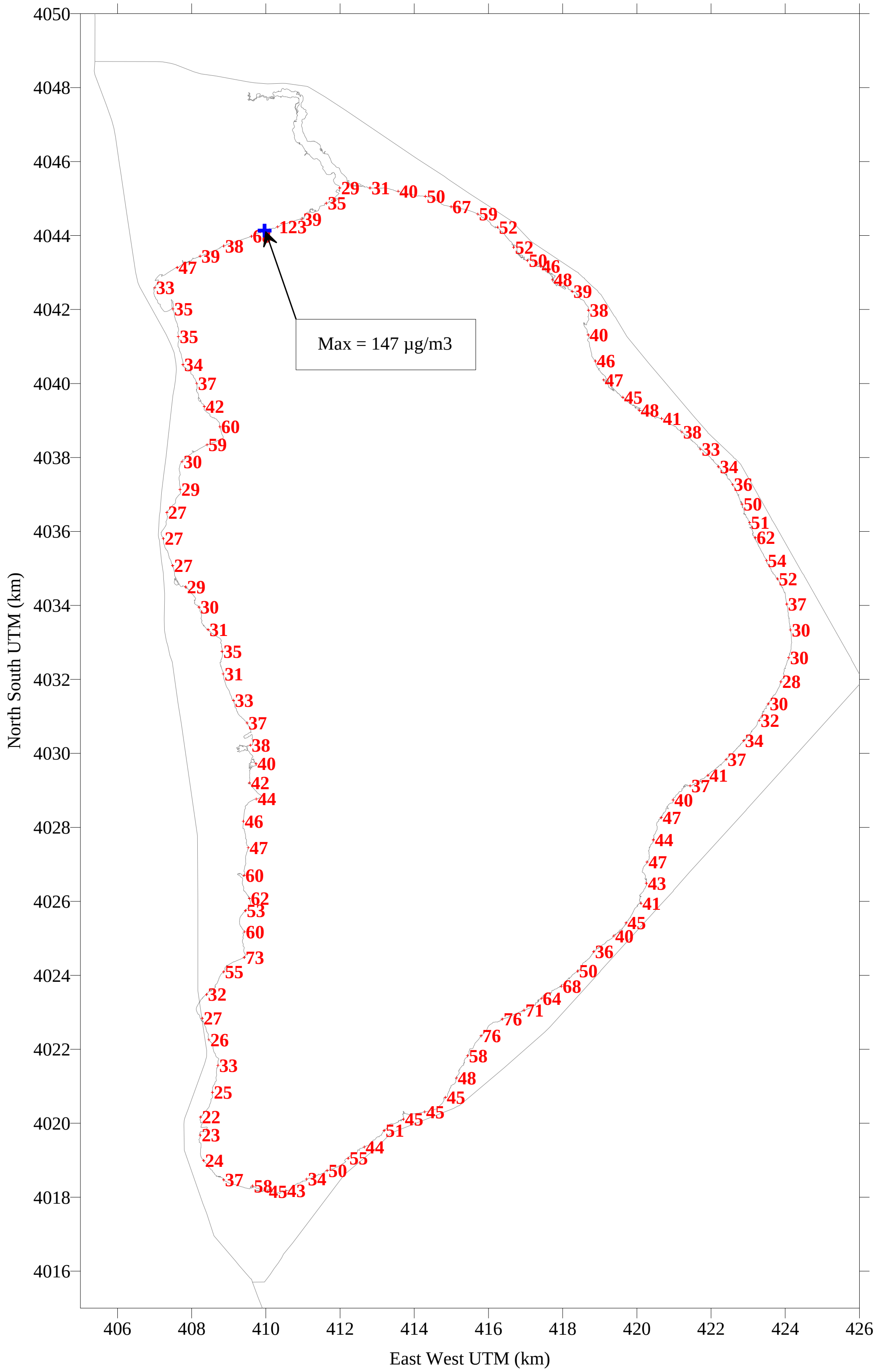

Figure 6.5 - Fifth highest 24-hour PM_{10} ($\mu g/m^3$) at shoreline receptors, no Keeler dunes, after controls (every 4th plotted)

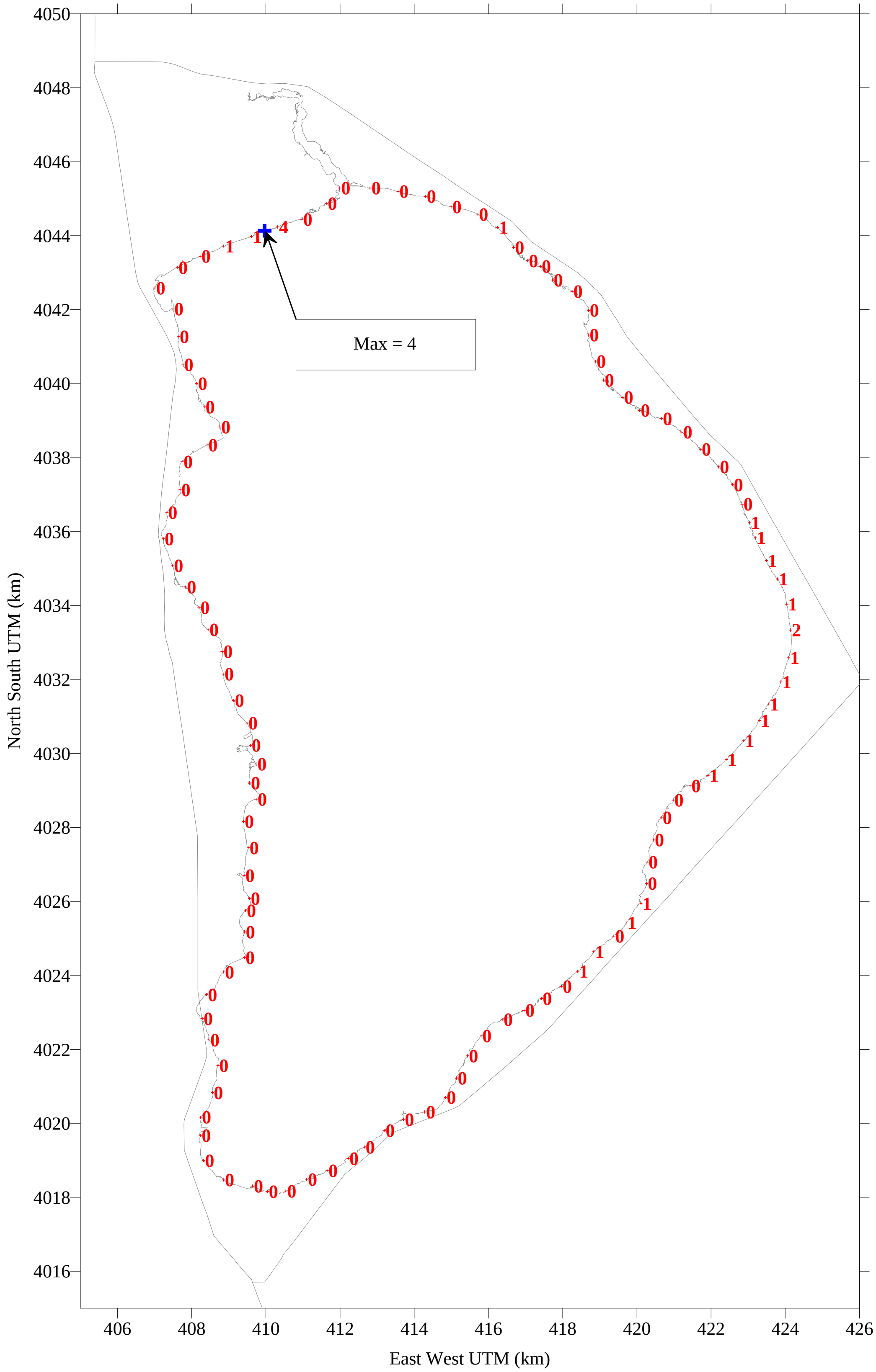

Figure 6.6 - Number of 24-hour PM_{10} predictions greater than 150 µg/m^3 at shoreline receptors, no Keeler dunes, after controls (every 4th plotted)

CHAPTER 7

Control Strategy and Attainment Demonstration

FIGURES

TABLES

7

Control Strategy and Attainment Demonstration

7.1 INTRODUCTION

On March 23, 2007, the United States Environmental Protection Agency (USEPA) published a finding that the Owens Valley Planning Area did not attain the federal 24-hour PM_{10} standard by December 31, 2006 as mandated by the Clean Air Act Amendments of 1990 (CAAA) (USEPA, 2007a). As a result of this finding, the 2003 Owens Valley SIP must be revised to include a control strategy that will provide for attainment of the federal standard as soon as practicable. In addition, the SIP control strategy must achieve at least a 5 percent reduction in PM_{10} emissions per year and demonstrate attainment with the federal standard by March 23, 2012, unless the USEPA grants an extension. Such an extension could extend that deadline by up to 5 years to March 23, 2017 (CAAA §179(d)(3)).

The proposed control strategy described in this chapter sets forth an overall plan to control dust from Owens Lake by combining the three Best Available Control Measure (BACM) methods discussed in Chapter 5: Shallow Flooding, Managed Vegetation and Gravel Blanket. These three BACM control methods are also the “most stringent measures” (MSM) that have been applied in a USEPA-approved SIP and are feasible for implementation at Owens Lake. The application of MSM was required by the USEPA for inclusion in the 2003 SIP to help ensure that the federal standard could be attained as expeditiously as practicable. For the purpose of regulatory requirements, these three BACM are also considered MSM for the Owens Valley Planning Area, and will be referred to as BACM in this chapter.

The overall PM_{10} control strategy for Owens Lake is based on first identifying dust source areas that cause or contribute to exceedances of the federal standard at the historic shoreline. After these areas are identified the District issues an order for the City to implement BACM to control dust from those areas. Under the 2003 SIP control strategy the District ordered the City to implement BACM on 29.8 square miles of the Owens Lake bed (GBUAPCD, 2003). Between July 2002 and June 2006, more than 12 square miles of the lake bed that were not controlled under the 2003 SIP control strategy were found to cause or contribute to exceedances at the historic shoreline. These areas and additional areas suspected of contributing to exceedances (for a total of 13.2 square miles) will be controlled under the proposed control strategy for this 2008 SIP. Any other areas that are found to cause or contribute to exceedances of the federal standard at the shoreline, after the additional controls are implemented, or which cause exceedances of the state PM_{10} standard in the communities will be controlled in the future. (GBUAPCD, 2006b)

If all the necessary dust control measures are implemented by December 31, 2013 in the Supplemental Dust Control Areas (SDCAs) and the Keeler dunes, the Planning Area can demonstrate attainment with the federal standard by 2017. This implementation deadline provides three calendar years to collect air quality monitoring data after the implementation of control measures. Three years of clean air quality data are necessary to provide evidence that the federal standard has been attained.

The following subsections describe the control strategy that was implemented through the 2003 SIP and will be implemented through the proposed control strategy.

7.2 2003 Dust Control Area 29.8 Square Miles

An analysis of dust events that occurred from January 2000 through June 2002 identified dust source areas that caused or contributed to exceedances of the federal PM_{10} standard at the historic shoreline of Owens Lake. These dust source areas covered 29.8 square miles of the lake bed. The modeling analysis showed that there would be no exceedances of the federal standard caused by these areas after dust control measures were implemented in the 2003 Dust Control Area (DCA). Under the requirements of the 2003 SIP, the City was ordered to implement dust control measures in these areas of the lake bed by December 31, 2006. The existing DCA is shown in Figure 7.1.

Shallow Flooding was implemented on 26.3 square miles of the DCA, while the remainder (3.5 square miles) was controlled using the Managed Vegetation DCM. The Shallow Flooding DCM is currently being operated in accordance with the 2003 SIP and the requirements of Board Order #031113-01. The Managed Vegetation DCM is currently being operated under a modified plan in accordance with the 2006 Settlement Agreement between the District and the City discussed below and in Section 5.3.1 (GBUAPCD, 2006b). Although the City's existing Managed Vegetation DCM site did not fully comply with the 50 percent vegetation cover requirement of the 2003 SIP, the vegetation that currently covers the site has substantially controlled PM_{10} emissions. To help ensure that the area does not cause or contribute to an exceedance of the federal standard at the shoreline, the City is implementing a modified Operation and Management Plan on the Managed Vegetation DCM site. This modified Operation and Management Plan is proposed as a revision to the Managed Vegetation requirements approved in the 2003 SIP for the existing site only and does not apply to any new Managed Vegetation areas constructed after 2006. The City is currently operating the site under a draft version of the Managed Vegetation Operation and Management Plan. The final plan will be approved by the District in 2008.

7.3 2008 Dust Control Area 13.2 Square Miles

An analysis of dust events during the period from July 2002 through June 2006 identified additional dust source areas that caused or contributed to exceedances of the federal standard. The process to identify these dust source areas was done in accordance with the procedures in the 2003 SIP Supplemental Control Requirements. In 2006, a dispute arose between the District and the City regarding requirements to control dust from additional areas at Owens Lake beyond the 29.8 square miles identified in the 2003 SIP. On December 4, 2006 a Settlement Agreement was approved by both parties to resolve this dispute. Under the major provisions of this agreement, the City agreed to implement dust control measures on an additional 13.2 square miles of the lake bed by April 1, 2010 and the District agreed to revise the 2003 SIP before March 1, 2008 to incorporate the provisions of the Settlement Agreement (GBUAPCD, 2006b). The 2008 control area is comprised of the Supplemental Dust Control Area (SDCA) (12.7 sq. mi) and Channel Area (0.5 sq. mi.) shown in Figure 7.1. There will be a total of 43.0 square miles of controls on the lake bed by 2010.

Under the proposed control strategy, the City can adjust the control efficiencies needed in each new control area to provide the minimum dust control efficiency (MDCE) necessary to prevent

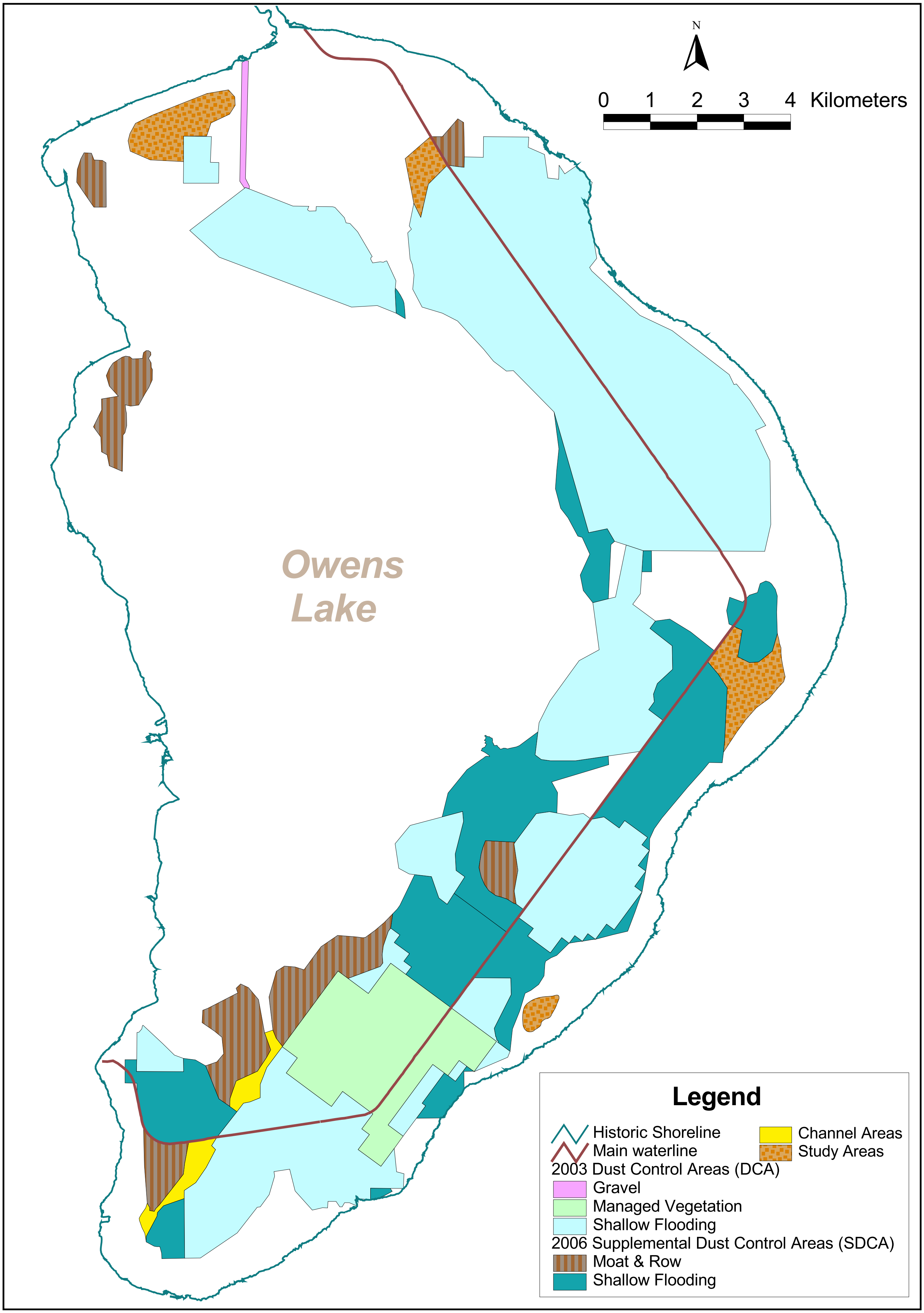

Figure 7.1 - 2008 Dust Control Measure footprint map

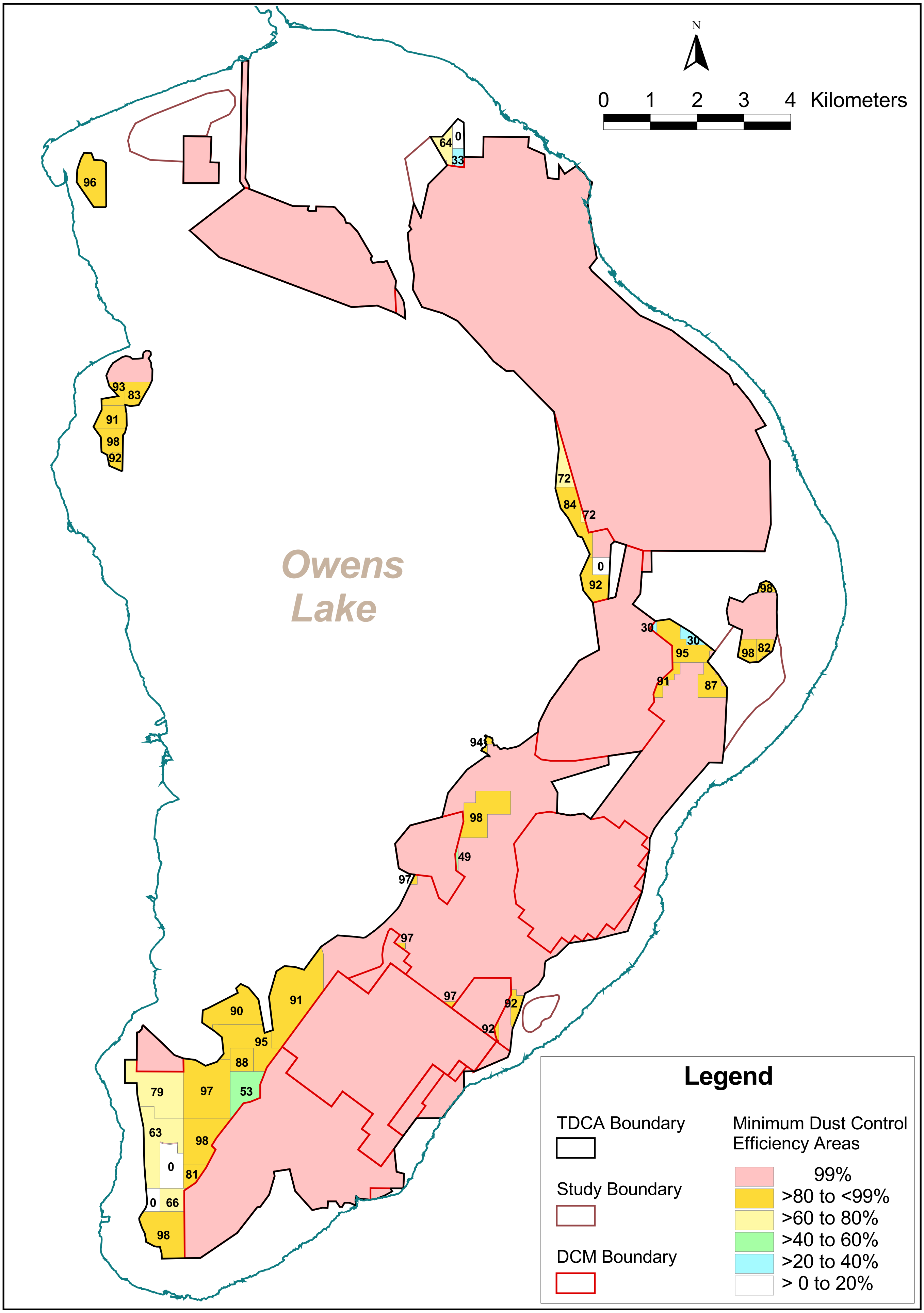

Figure 7.2 - TDCA Minimum Dust Control Efficiency map

exceedances of the federal standard at the historic shoreline. As discussed in the PM_{10} control measure descriptions in Chapter 5 and in the modeling discussion in Chapter 6, each dust source area in the SDCA and Channel Area has a target MDCE ranging from 0 percent to 99 percent (Figure 7.2).

7.3.1 Shallow Flooding Dust Control Areas

Figure 7.2 shows the target MDCEs for all of the dust source areas to be constructed under this 2008 SIP. At least 9.2 square miles within the 13.2 square mile dust control area will be controlled with Shallow Flooding as discussed in Chapter 5. The amount of water coverage in each area will be adjusted using the control efficiency and water cover curve shown in Figure 5.8. The Shallow Flooding areas in the SDCA will be fully implemented and in operation by April 1, 2010.

7.3.2 Moat & Row Dust Control Areas

The City will conduct demonstration projects to evaluate the effectiveness of the Moat & Row dust control measure. Depending on the results of the Moat & Row demonstration projects and the approvals required by other responsible agencies, the City, in its sole discretion, may decide which DCMs to propose for implementation in the areas designated for Moat & Row in Figure 7.1. Up to 3.5 square miles of the SDCA may be controlled by either Moat & Row or approved BACM.

Depending on the results of the Moat & Row demonstration projects, the control measure implemented in the Moat & Row areas may include Moat & Row, enhanced Moat & Row (e.g. closer Moat & Row spacing, Moat & Row with some Shallow Flooding, Moat & Row with some vegetation), combined Moat & Row/ Shallow Flood, MDCE-BACM or BACM. If the City is permitted by other responsible agencies to implement Moat & Row in any of the SDCA areas, it shall be designed and constructed to achieve the target MDCEs shown in Figure 7.2. The City will consult with the District before making its decision and will inform the District in writing. If the City implements Moat & Row in any of the areas so designated in Figure 7.1, it must be operational by October 1, 2009.

Because the Moat & Row dust control measure has not been fully tested, there is a possibility that wind blown dust from Moat & Row areas may cause or contribute to exceedances of the PM_{10} standard. In that case, modifications of the Moat & Row design, or replacement of the control measure to MDCE-BACM or other approved BACM may be necessary. In accordance with the Settlement Agreement, the City will have one opportunity to modify the Moat & Row design, if the Air Pollution Control Officer (APCO) determines that any implemented Moat & Row control area resulted in an exceedance of the federal standard. After April 1, 2010, a second exceedance of the standard caused by a previously remediated Moat & Row area would result in the City replacing the Moat & Row control measure with MDCE-BACM or other approved BACM dust control measure. A schedule for transition of the Moat & Row areas to BACM is provided in Exhibit 11 of the Settlement Agreement (GBUAPCD, 2006b).

7.3.3 Channel Areas

The City will implement DCMs in the 0.5 square mile (320 acre) Channel Area shown in Figure 7.1. This is a natural drainage channel on the southern portion of the lake bed that contains about 300 acres of sensitive wetland habitat and delineated water channel and therefore has significant resource issues and regulatory constraints. Because this is a natural drainage channel, additional regulatory requirements may apply that could alter the design and operation of DCMs in this area. Although the Channel Area is not part of the 12.7 square mile SDCA, it must be included as part of the control strategy for the SDCA in order to demonstrate attainment of the NAAQS. PM_{10} emissions from the Channel Area must be controlled by April 1, 2010. Control measures implemented in the Channel Area may include methods that both control PM_{10} emissions and enhance the channel habitat. This could include wetting and spreading of water through the area for the purpose of wetland habitat development and attendant dust control and/or vegetating emissive portions of the area.

7.3.4 Fall and Spring Shallow Flooding Ramping Flows

As discussed in the DCM descriptions in Chapter 5, after April 1, 2010, Shallow Flooding wetness cover may be reduced during the ramping flow periods from October 1 – 15, and from May 16 – June 30 of each year to reduce water use in areas that are required to apply BACM and achieve 99 percent control efficiency. Dust events during these periods have been less intense than the larger dust events that occur in winter and early spring. This is also a period of high evaporative water loss and the ability to fully wet the shallow water areas may be constrained by water supply limitations during extremely hot weather periods. Except during the ramping flow periods in the spring and fall, all control areas requiring 99 percent control efficiency must be in full compliance with BACM and the minimum areal wetness cover requirement of 75 percent.

The amount of wetness cover reduction that will be allowed in these Shallow Flooding areas will be subject to limits determined through air quality modeling. This modeling analysis was based on the required emission reductions for uncontrolled dust events that took place from July 2002 through June 2006, the Shallow Flooding control efficiency curve in Chapter 5, and the following minimum wetness covers:

Ramping Flow Period	Minimum Areal Wetness Cover
May 16 - May 31	70%
June 1 - June 15	65%
June 16 - June 30	60%.

The modeling analysis showed that minimum areal wetness cover specified for the ramping period should be sufficient to prevent exceedances of the federal standard for all of the shallow flood areas that are required to have 99 percent control efficiency during the regular season, except for the following areas: 7199, 7499, 7522 and 7544 (Ono and Richmond, 2007). These areas are shown in Figure 7.3. For these areas the minimum areal wetness cover during the spring ramping flow period cannot be less than the following areal covers:

Dust Control Area	Minimum Areal Wetness Cover	Area-Specific Ramping Flow Period
7199	75%	May 16 - June 30
7499 (period 1)	70%	May 16 - May 31
7499 (period 2)	65%	June 1 - June 30
7522	70%	May 16 - June 30
7544	70%	May 16 - June 30

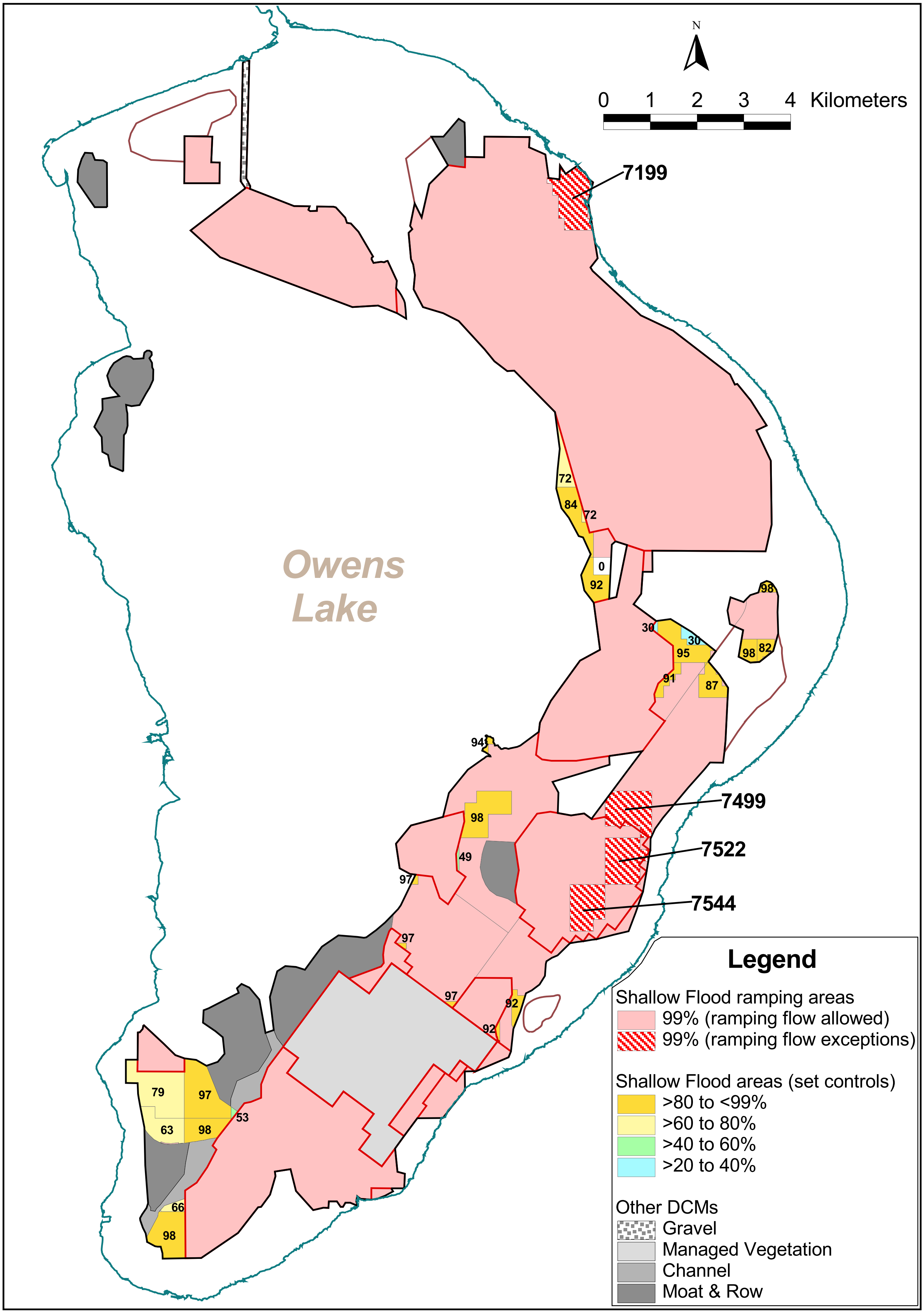

Figure 7.3 - Shallow Flood ramping areas

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This list is subject to change upon written request of the City and APCO approved modeling that shows some other configuration could also keep the lake bed in compliance (Ono and Richmond, 2007).

During exceptionally hot weather periods evaporative water losses from the Shallow Flooding areas may be higher than anticipated during the ramping flow period. In this case, it is possible that despite providing the maximum amount of water that has been historically applied, that the existing water delivery system cannot provide enough water to meet the minimum areal wetness cover requirements. If for any Shallow Flooding area, the percent of areal wetness cover during these ramping flow periods is below the minimum areal wetness cover, specified above, and there were no monitored or modeled exceedances of the federal standard at the historic shoreline, that area will be deemed to be in compliance, if the City demonstrates in writing and the APCO reasonably determines in writing that the maximum mainline water flows were maintained during the applicable period. This maximum water flow provision that allows cover less than the minimum areal wetness cover, only applies to areas that were required to have 99 percent control efficiency during the regular Shallow Flooding season (October 16 through May 15). Shallow Flooding areas that are set at control efficiency levels less than 99 percent must maintain the required areal wetness cover in accordance with the currently approved MDCE control strategy during the entire dust season from October 15 through June 30.

7.4 DUST CONTROLS FOR STUDY AREAS

Several dust source areas that were active between July 2002 and June 2006 were excluded from the proposed 2008 control area due to uncertainty regarding the actual boundaries of the emissive areas. Additional monitoring of sand flux and investigation as to the actual emissive area boundaries will be done in these four Study Areas to better quantify the contributions from these areas to shoreline PM_{10} concentrations. These Study Areas are shown in Figure 7.1. Starting from July 1, 2006, Dust ID data collected from the sites will be used to determine if any of these areas are causing or contributing to exceedances of the federal standard at the shoreline. After May 1, 2010, if the District determines that any Study Area causes or contributes to an exceedance at the shoreline, the City will be required to apply MDCE-BACM or BACM as necessary to bring that area into compliance. However, if the City is not in compliance with Sections 1 and 2 of the Settlement Agreement regarding the amount, timing and operation of existing and future dust controls, the District may issue orders to control the Study Areas prior to April 1, 2010. To make the determination, the District will follow the SCR procedures that are in effect at the time of the determination (GBUAPCD, 2006b).

7.5 DUST CONTROLS FOR KEELER DUNES

The Keeler dunes are located northwest of the town of Keeler above the 3600-foot elevation that defines the historic Owens Lake shoreline (Figure 4.14). The total area covered by deep sand is about 0.64 square kilometers (157 acres). Significant portions of the Keeler dunes were formed from sand moving off the lake bed after it became dry. Figure 7.4 shows a sand dune about one-half mile north of Keeler in the Keeler dune field that formed across the abandoned State highway after the lake was dried by the City's water diversions. Sensits and sand catchers have been installed in the Keeler dunes so that their PM_{10} emissions could be modeled, and not attributed to lake bed sources. There is some recent evidence that the Shallow Flooding DCM constructed on the lake bed west of the dunes in 2001 may have arrested the growth of the Keeler dunes. The District and others have observed that old landmarks, desert pavement surfaces and dead upland shrubs that were buried under the dunes have become exposed; this may be due to the lack of new sand from the lake bed that replenished the dunes before dust controls were implemented.

Due to their proximity to the town of Keeler, dust emissions from the Keeler dunes contribute significantly to exceedances of the federal PM_{10} standard in the town. After all the lake bed sources in the 2003 and 2008 dust control areas are controlled, the Keeler dunes area is expected to be the only remaining dust source that is causing exceedances of the standard in the planning area. The District will work with the City and other federal, state and local agencies to develop a plan to control dust emissions from the Keeler dunes. If additional PM_{10} control measures are required for the Keeler dunes, they will be ordered by the District before January 1, 2012 and implemented by the responsible parties before January 1, 2014 in order to demonstrate attainment of the federal standard by 2017.

The other major dune area, the Olancha dunes, is shown in Figure 4.14 and were not monitored or included in the model. The Olancha dunes are natural dunes that were present prior to the City's water gathering activities in the Owens Valley. If PM_{10} violations are attributed to the Olancha dunes, these violations will be treated as natural events and a Natural Events Action Plan will be developed and implemented in accordance with the USEPA rule on Exceptional Events (see Section 2.2.3.3).

7.6 FUTURE SUPPLEMENTAL DUST CONTROL AREAS

Since 1999, the District has continuously monitored air quality and wind erosion activity at Owens Lake through the Owens Lake Dust Source Identification (Dust ID) program. The results of the monitoring data collected by the Dust ID program from 1999 through 2002 resulted in the 29.8 square miles of dust controls required in the 2003 SIP. Data collected from 2002 through 2006, along with a joint effort between the District and the City to identify all lake bed areas that posed a significant risk of becoming sources, resulted in the requirement for the additional 13.2 square miles of controls required in this 2008 SIP. If any new dust source areas develop on the lake bed after the completion of construction of the 13.2 additional square miles of controls in April 2010, they will be identified from information collected through the Dust ID Program and evaluated following the procedures in the Supplemental Control Requirements found in Chapter 8. These events may be caused by:

- New source areas on the lake bed that were not identified prior to July 1, 2006, or
- Areas that are located within the existing 43 square miles of DCMs that are in compliance with MDCE-BACM or BACM, but residual emissions are still found to cause or contribute to an exceedance of the federal standard.

If there are new dust source areas identified after April 1, 2010, when all DCMs ordered by this SIP have been completed, they will be identified from information collected through the Dust ID Program. However, if the City is not in compliance with Sections 1 and 2 of the Settlement Agreement regarding the amount, timing and operation of existing and future dust control controls, the District may issue orders to control these areas prior to April 1, 2010. If the new source areas are determined by the APCO to cause or contribute to any monitored or modeled PM_{10} NAAQS exceedance at the historic shoreline, those areas will be identified for MDCE-BACM or BACM implementation.

Figure 7.4 – Sand dune that formed across the old State Highway to Death Valley (view looking southeast toward Keeler)

Some significant dust source areas may be located within dust control areas that are in compliance with the approved control requirements, but due to extreme emissive conditions, may still cause or contribute to a monitored or modeled exceedance of the federal standard at the historic shoreline. In this case, the control measures may be adjusted to provide more uniform and/or denser application of the dust controls in the source area. For example, Shallow Flooding may be applied to a small-scale hotspot area that is located within a dust control area that may be in compliance with BACM over a larger scale area. Increased application of water or saltgrass, or the application of gravel, may be necessary to control emissions from these types of emission areas.

If the modeling or monitoring analyses reveal new dust source areas on the lake bed, or emissions from existing control areas cause or contribute to exceedances of the federal standard at the shoreline, the District will issue an order for the City to control those new source areas or increase the minimum dust control efficiency on existing dust controls.

The Dust ID Program has continuously evolved since it was started in 1999. Data collection has improved with daily collection of sand flux data, more sand flux and PM_{10} monitors have been placed in the field, and more video cameras have been added to help with the mapping and characterization of active source areas. However, the District and the City recognize that a method for identifying sources of potential exceedances of the federal standard at the historic shoreline could be developed that is superior to and could replace or modify the current Dust ID Program. The District and the City will work cooperatively with the help of technical experts to determine if better methods can be developed and/or improvements can be made to the current Dust ID Program.

7.7 CONTROLS TO MEET THE STATE PM_{10} STANDARD

Following the implementation of the proposed control strategy, PM_{10} levels are expected to show compliance with the federal standard of 150 $\mu g/m^3$ at the shoreline of Owens Lake. However, compliance with the state PM_{10} standard of 50 $\mu g/m^3$ in the communities surrounding Owens Lake may require additional control measures. In order to help meet the state PM_{10} standard, the Board adopted District Rule 401.D in December 2006. This rule will require the City to implement dust control measures in lake bed areas that cause or contribute to monitored violations of the state PM_{10} standard in any community surrounding Owens Lake. In accordance with the Settlement Agreement, any District orders to implement dust control measures to meet the state standard will be based on Dust ID data collected after April 1, 2010. After this date, the DCMs for the 2003 and 2008 control areas will have been fully implemented. For the purpose of applying District Rule 401.D, the Dust ID model results will only be used to determine if any lake bed dust source area(s) caused or contributed to a state PM_{10} standard violation after that violation is monitored at a community-based monitor site. If the City is not in compliance with Sections 1 and 2 of the Settlement Agreement regarding the amount, timing and operation of existing and future dust controls, the District may issue orders to control lake bed dust source areas that cause monitored violations of the state PM_{10} standard in communities near Owens Lake prior to April 1, 2010 (GBUAPCD, 2006b).

7.8 MODELED ATTAINMENT DEMONSTRATION

The attainment demonstration is performed through the use of a USEPA approved model to forecast the air quality improvement associated with air pollution control measures. Chapter 6 and the Air Quality Modeling Report in Appendix B provide the modeling analysis for the required attainment demonstration. Air quality modeling for the 2008 SIP utilized the CALPUFF modeling system. CALPUFF is the USEPA recommended modeling approach for long-range transport studies and for near-field modeling of complex wind fields. To demonstrate attainment with the federal PM_{10} standard at Owens Lake any receptor location at or above the historic shoreline (elevation 3,600 feet) cannot have more than 1 day per year on average above the federal 24-hour PM_{10} standard (150 $\mu g/m^3$). The number of exceedances is averaged over the number of years analyzed in the modeling analysis to determine if the average number of exceedances is greater than 1.0.

7.8.1 Modeling the 2003 Control Area – 29.8 Square Miles

An air quality modeling analysis was performed to forecast PM_{10} concentrations after the application of BACM on the 29.8 square mile dust control area required under the 2003 SIP. The model was run for the period from January 2000 through June 2002. As discussed in the 2003 SIP, the results showed that the 29.8 square mile dust control area would be sufficiently controlled to prevent the areas of the lake bed that were active at that time from causing violations of the federal standard. Over the 2.5 year modeling period, the third highest PM_{10} concentration after control measures were applied was predicted to be 149.9 $\mu g/m^3$.

7.8.2 Modeling the 2003 and 2008 Control Areas – 43.0 Square Miles

An air quality modeling analysis was performed to forecast PM_{10} concentrations after the application of the proposed control strategy for the combined 43.0 square mile dust control area required under the 2003 SIP and the proposed control strategy for the 2008 control area. The model was run for the period from July 2002 through June 2006 using the minimum target control efficiencies for the 2008 control areas. The model assumed that no emissions were coming from the 2003 control areas. Because dust control measures were not fully implemented in the 29.8 square mile DCA during the modeling period from July 2002 through June 2006, it was assumed that no emissions were coming from the 2003 DCA for the purpose of determining if additional dust source areas caused exceedances of the standard. A revision of the target MDCE strategy may be necessary in the future if the 2003 DCA is found to have significant contributions after it is in full compliance with BACM requirements.

The air quality modeling analysis, discussed in Chapter 6, predicted that after dust control measures are implemented on the 2008 control area that two shoreline receptor locations will have 4 days over the federal standard for the 4-year modeling period. The 5^{th} highest PM_{10} concentration at the worst site was 147 $\mu g/m^3$. Therefore, the strategy of controlling dust from the 2008 control area using the target MDCEs will result in an average of 1 exceedance per year, which is the maximum allowed for the attainment demonstration. The modeling indicated exceedances at the most frequently impacted shoreline receptor were attributed to wind blown dust from Study Area 1 in the northwest area of the lake bed. If the Study Areas continue to cause exceedances after July 1, 2006, the District will require controls on these areas.

7.9 CHANGES TO BACM

Existing BACM controls may be replaced with other BACM to help reduce implementation and operating costs. In addition, control measure research may identify new BACM control methods that are as effective as the BACM methods discussed in Chapter 5. Any approved BACM can be changed to any other approved BACM, however, such transitions must be done in a manner that at all times results in the performance specifications for one or the other BACMs being met. Changes to BACM may require approval by the District and other responsible agencies, including the California State Lands Commission. Any environmental analyses, approvals, permits or leases required as a result of the transition are the sole responsibility of the City.

Testing of any new or modified BACM on the control areas must be approved by the APCO. New methods may include different control method approaches or may be adjustments to the Managed Vegetation, Shallow Flood or Gravel Blanket BACM methods. Any control measure research will be performed under a project test protocol approved by the APCO. Any new BACM must show that it will not cause federal PM_{10} standard violations at the historic shoreline. The regulatory requirements to adjust, change or research new BACM are discussed in detail in Attachment D to the Board Order, "2008 Procedure for Modifying Best Available Control Measures (BACM) for the Owens Lake Planning Area" (Chapter 8). Attachment D provides a special provision for step-wise reductions in the amount of wetness cover on Shallow Flood areas such that PM_{10} control is maintained and water use efficiency is maximized. Attachment D also makes special provisions for the testing of Moat & Row. These special provisions are the result of the 2006 Settlement Agreement between the District and the City.

7.10 IMPLEMENTATION MILESTONES AND EMISSION REDUCTIONS

Table 7.1 summarizes the PM_{10} emission reductions associated with each of the milestones in the 2003 SIP control strategy and the proposed 2008 SIP control strategy. The total PM_{10} emission inventory includes emissions from all PM_{10} emission sources in the planning area. A breakdown of these emission categories can be found in Chapter 4. The emissions estimates and milestones provided in this table correspond to the graph shown in Figure 7.5.

Baseline emission inventories were developed for 2000 and 2006. It was not possible to develop good overall estimates for windblown dust for the interim years, due to the construction of control measures in the highest dust producing areas on the lake bed. During this period, many of the key wind erosion monitoring sites were removed to allow for the installation of dust control measures. From July 2005 through June 2006 most of the active erosion sites were monitored for windblown dust emissions. Due to particularly emissive lake bed conditions that naturally developed due to weather conditions, the 2006 emissions inventory included many windblown dust source areas that were not active in the 2000 emissions inventory. Because of the addition of these new dust source areas, the 2006 emissions inventory is slightly larger than the 2000 inventory, even though dust control measures were implemented on 16.5 square miles of the lake bed in 2003. This is an excellent example of the unpredictable nature of Owens Lake bed emission areas.

The 2006 inventory is the baseline emissions inventory that will be used to determine the 5 percent emission reduction rate that is required under CAAA §189(d) (see Chapter 2.2.3). As shown in Figure 7.5 the proposed control strategy will reduce PM_{10} emissions in the planning area at a rate of about 11 percent per year from 2006 to 2014.

Attainment of the federal PM_{10} standard is expected in 2017. By this time, the District expects to have three years of air monitoring data that show no violations of the federal standard in the planning area. To meet this attainment deadline, the final control measures for the Keeler Dunes area must be implemented by December 31, 2013.

To help prevent new dust source areas from causing additional violations of the federal standard, the District will continue to monitor and observe dust through the Owens Lake Dust ID program.

Any new dust source areas that are determined to cause or contribute to an exceedance of the federal standard at the shoreline will be controlled through the Supplemental Control Requirements contained in the proposed Board Order. After May 1, 2010 and at least once per year thereafter, the District will evaluate new dust source areas to determine if they cause or contribute to an exceedance at the shoreline. For the Study Areas shown in Figure 7.1, this determination will be made on information collected after July 1, 2006. For all other lake bed areas, this determination will be based on information collected after April 1, 2010.

7.11 REASONABLE FURTHER PROGRESS

Under CAAA Section 189(c), the demonstration of attainment SIP is required to include quantitative milestones that are to be achieved every three years until the area is redesignated attainment. These milestones must demonstrate reasonable further progress toward attainment of the NAAQS by the attainment date. Table 7.1 includes the milestones that will be tracked to achieve the emission reduction trend as shown in Figure 7.5 to demonstrate reasonable further progress toward attaining the NAAQS. Milestones associated with this 2008 SIP include completion of Moat & Row dust controls by October 1, 2009, completion of Shallow Flood dust controls by April 1, 2010 and control of the Keeler dunes by January 1, 2014. The Planning area is then expected to attain the NAAQS after three years or by January 1, 2017. As required by Section 189(c)(2) of the CAAA, the District shall submit to the USEPA, no later than 90 days after the date of each milestone, a demonstration that each milestone has been met.

7.12 CONTINGENCY MEASURES SUPPLEMENTAL CONTROLS

The federal Clean Air Act Amendments of 1990 require a description of contingency measures (CAAA Section 172(c)(9) and 182(c)(9)). The contingency measures are control measures that will be implemented in case the 2008 SIP control strategy fails to bring the planning area into attainment or the Reasonable Further Progress Milestones cannot be met. The District commits to make a Supplemental Control Requirements (SCR) determination at least once a year, starting after May 1, 2010, as to whether there have been any monitored or modeled exceedances of the PM_{10} NAAQS from areas on the Owens Lake bed that have not been included in the 2008 SIP control strategy or if implemented controls do not control emissions sufficiently to attain the NAAQS.

The procedure for the SCR determination is described in detail in the Board Order (Order, Paragraphs 10 and 11 and Attachment B, “2008 Owens Valley Planning Area Supplemental Control Requirements Determination Procedure”). Any areas that cause or contribute to a NAAQS exceedance, based on dust events that occur after April 1, 2010, will be controlled according to the schedule of contingency measures set forth in the Board Order (Attachment B, Exhibit 1). This includes emissive areas that have no dust controls, as well as existing control areas that may need additional control. The time allowed for implementation of contingency measures varies according to the type of measure to be implemented and vary from as little as one month for existing Shallow Flood areas that simply require additional wetness, to as much as three years for the construction of new dust control measures.

If, based on an analysis of the Dust ID data, the APCO determines that there are new areas that cause or contribute to a NAAQS exceedance, or that existing controls are not sufficient to prevent NAAQS exceedances, the following procedure will be followed:

1. The APCO will issue a written SCR determination to the City.

Table 7.1 - Control strategy milestones and estimated PM_{10} emission reductions.			
Milestone	1st Year in full Operation	Emission Reductions for Milestone (tons/year)	Total PM_{10} Emissions Inventory (tons/year)
Year-2000 Total PM_{10} Emissions	2000		83,232
2003 SIP Control Area			
Phase I - 10 sq. mi.	2002	23,475	59,757
Phase II - 3.5 sq. mi.	2003	758	58,999
Phase IV** - 3 sq. mi.	2004	11,542	47,457
Year-2006 Total PM_{10} Emissions	2006		85,692
Phase V - 13.3 sq. mi.	2007	39,405	46,287
2008 SIP Control Area			
Moat & Row control area	2010*	9,922	36,365
Shallow Flood control area	2011	20,529	15,836
Keeler dunes control area	2014	8,302	7,534
Demonstrate Attainment with federal PM_{10} standard	2017		7,534

* Supplemental Control Requirements: After April 1, 2010 and at least once per year, the District will determine if additional dust source areas cause or contribute to exceedances of the federal PM_{10} standard at the historic shoreline and must be controlled.

** Phase III is the Brady Highway construction

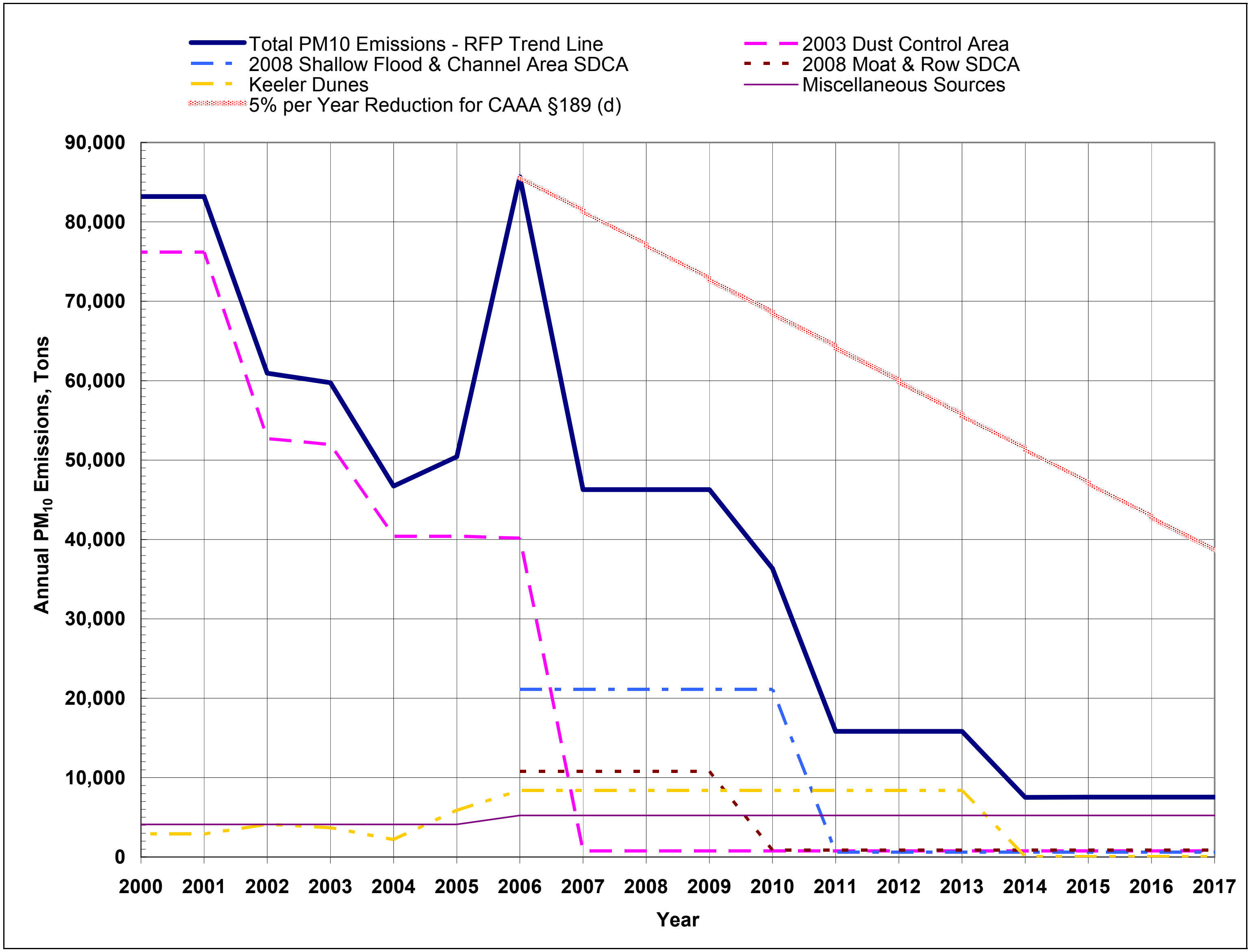

Figure 7.5 The PM_{10} emissions forecast for the SIP milestones shows that the control strategy complies with the federal clean air act requirement to reduce emissions by at least 5% per year.

2. The City has 60 days to submit an alternative analysis of the data used by the APCO to make the determination.
3. Based on a review of the City's alternative analysis, within 60 days the APCO may withdraw, modify or confirm the original SCR determination.
4. If the City does not agree with the APCO's action in Step 3, the City may initiate a 60-day Dispute Resolution Process as set forth in the 2006 Settlement Agreement between the District and the City. Based on this process, the APCO may modify the SCR determination.
5. If the District and the City are unable to resolve disagreements through the Dispute Resolution Process, the City may appeal the APCO's SCR determination to the California Air Resources Board (CARB) under the provisions of Health & Safety Code Section 42316.
6. In the case of a City appeal to the CARB, the APCO's SCR determination will be considered a final contingency measure action, if it is affirmed by the CARB and will be effective on the date of the CARB decision.

Health & Safety Code Section 42316(b) provides that pending a decision of CARB, the City is not required to comply with any measure imposed by the supplemental control determination. This creates a potential conflict with the CAAA, which requires that the SIP contain automatic contingency measures when reasonable further progress or attainment with the National Ambient Air Quality Standards are not obtained by the proposed control measures. Section 172(c)(9) of the CAAA provides that:

> Such [nonattainment] plan shall provide for the implementation of specific measures to be undertaken if the area fails to make reasonable further progress, or to attain the national primary ambient air quality standard by the attainment date applicable under this part. Such measures shall be included in the plan revision as contingency measures to take effect in any such case without further action by the State or Administrator.

In addition, Section 182(c)(9) similarly provides that:

> In addition to the contingency provision required under section [172](c)(9) of this title, the plan revisions shall provide for the implementation of specific measures to be undertaken if the area fails to meet any applicable milestone. Such measures shall be included in the plan revision as contingency measures to take effect without further action by the State or Administrator upon a failure by the State to meet the applicable milestone.

The District and the City intend that the 2008 Order and SIP be consistent with both federal and state law (Settlement Agreement Para. 28(C)). To reconcile the need for automatic contingency measures with Health & Safety Code Section 42316, the District proposes that the CARB adopt procedural timelines for its hearing under Section 42316 to require that its decision be rendered within 90 days of the filing of an appeal by the City. The District believes this delineated time for resolving the City's challenge will enable the supplemental control measure to be implemented expeditiously and without further rulemaking by the state, which would violate Sections 172(c)(9) or 182(c)(9) of the federal Clean Air Act. Moreover, the 90-day time period will be sufficient for the CARB to fully consider the positions of the parties and render its decision given the extensive technical reviews and dispute resolution procedure that the District and the City would undertake before the request for a hearing under Section 42316 would be made (Settlement Agreement Paragraphs 18 and 32). The dispute resolution process is anticipated to narrow and more specifically define the issues remaining for resolution by the CARB, if any, under Section 42316, and define the contents of the administrative record upon which the CARB's decision would be based.

As a practical matter, challenges to the supplemental control measures are expected to be unlikely, or at least limited given the extensive agreements reached by the District and the City in the Settlement Agreement (e.g., Settlement Agreement Paragraphs 18(B)(iv) and 40). Under some circumstances, the City's appeal may be limited or otherwise not challenge the supplemental control measure itself, but rather challenge some other aspect of the fees or procedure utilized by the District that would not delay the immediate planning that would be required for implementation of the supplemental control measure.

To further confirm the intention that the Order comply with CAAA Sections 172(c)(9) and 182(c)(9), the Order relies upon action by the CARB to issue its determination under Section 42316, or otherwise require the City to immediately undertake alternative supplemental control measures within 90 days in such circumstances where automatic control measures are required under those sections of the CAAA. The CARB presumptively will take these federal requirements into account in its determination of the City's appeal and to issue such interim orders as necessary to implement automatic supplemental control measures so that this Order complies with the CAAA and can be approved by the U.S. Environmental Protection Agency as a proper State Implementation Plan. This presumption of administrative regularity, that the CARB will carry out its functions in a manner consistent with federal and state law and in compliance with all applicable requirements thereunder, is consistent with the 2006 Settlement Agreement between the City and the District that the terms of their agreement be adopted as part of a legal, valid SIP (2006 Settlement Agreement Para. 28).

As discussed in Sections 2.2.2.2 and 8.2 (Paragraphs 10 and 13 of the Board Order) in this 2008 SIP, under the provisions of Section 42316, the District has the authority to require the City to undertake all reasonable measures necessary to mitigate the air pollution caused in the District by the City's water-gathering activities. Nothing in this 2008 SIP, or the 2006 Settlement Agreement between the District and the City, limits the District's ability to order the City to take such reasonable measures that may be beyond the scope of this SIP and its incorporated Board Order. The District makes the commitment in Paragraph 13 of the Board Order (Chapter 8) to use its authority under Section 42316 to continue to ensure that the City takes all reasonable actions that may be necessary to bring the Owens Valley PM_{10} Planning Area into attainment with the NAAQS.

7.13 IMPLEMENTATION MONITORING AND ENFORCEMENT

Adoption of the control strategy set forth in this 2008 SIP will require the District to maintain programs to monitor and enforce the proper and timely execution of mandatory implementation and air quality attainment provisions of this 2008 SIP. With regard to air quality, the District will continue to monitor PM_{10} levels in the OVPA in order to determine:

- Whether reasonable further progress is being made, as predicted by the estimated annual emission trend (Figure 7.5),
- Whether the control strategy achieves progress toward attainment of the 24-hour PM_{10} NAAQS by December 31, 2017 and
- Whether the PM_{10} NAAQS has been attained in the OVPA.

With regard to control measure deployment, the District will monitor and enforce the City of Los Angeles' implementation of the control strategy, to ensure that the control measures are properly and timely installed, and that their installation and operation conform to the design and performance requirements of this 2008 SIP. Failure to meet any of the mandatory project implementation milestones set forth in Section 7.10 or failure to meet any of the requirements set forth in the Board Order (Section 8.2) are subject to enforcement as authorized by California Health & Safety Code §42316. This includes the requirements associated with the implementation, operation and maintenance of dust controls, as well as the environmental impact mitigation measures associated with the project. Although the District has prepared a full project-level environmental impact report for this SIP that analyzes anticipated project impacts, any additional environmental analysis, leases, easements and permit approvals required to implement the control measures are the sole responsibility of the City. For enforcement purposes, each Phase or Increment is a separate milestone.

The District will continue to ensure the City operates all dust control measures such that they comply with the performance requirements set forth in the SIP. This includes measuring the wetness cover in Shallow Flood areas and the vegetation cover in Managed Vegetation areas. Compliance measurement on the large scale of Owens Lake dust controls typically employs the use of satellite imagery coupled with ground-truthing. Improvements to the methods used for control measure compliance and enforcement will continue. Paragraph 19 of the Board Order in Chapter 8 and Section 29 of the 2006 Settlement Agreement commit the District and the City to work collaboratively to develop improved wetness and vegetative cover measurement techniques, control efficiency relationships and compliance specifications for all PM_{10} control measures.

With regard to the impact of the control measures on the environment, the District adopted Mitigation Monitoring and Reporting Programs at the time it certified the Final Environmental Impact Reports for the 1997 SIP (GBUAPCD, 1997), the 2003 SIP (GBUAPCD, 2003) and this 2008 SIP (GBUAPCD, 2008). As required by the Mitigation and Monitoring Programs, the District will enforce the mitigation measures, as well as elements of the project description, that are intended to avoid or lessen adverse environmental impacts of implementing the control strategy. Some of those mitigation measures and project elements require long-term monitoring of certain environmental effects of implementing the control strategy, and taking appropriate responsive action when the monitoring discloses an adverse environmental effect.

7.14 COST AND EMPLOYMENT

The cost of implementing PM_{10} control measures on the Owens Lake bed depends on the total acreage and types of DCMs used by the City of Los Angeles to meet the NAAQS. Based on actual costs for DCMs in place and the City's estimates for work to be constructed, LADWP staff estimates that the total cost of planning, design, permitting and construction for the 29.8 square miles of DCM that were in place by the end of 2006 were about $415 million. Costs associated with the additional 13.2 square miles of controls required by this 2008 SIP are estimated to be at least $125 million. Total project capital costs are therefore at least $510 million (LADWP, Harasick, 2007).

Operation and maintenance costs are estimated by the City to be approximately $17.5 million per year. The annual cost of water for the project is estimated to be about $24 million. This estimate makes the conservative assumption that the City replaces the water supplied from the Los Angeles Aqueduct with purchases from the Metropolitan Water District at a cost of $450 per acre-foot. (Actual replacement costs may vary.) Total annual costs are estimated to be $41.5 million.

The cost for control of PM_{10} emissions in terms of dollars per ton is instructive in that it allows the cost of PM_{10} control at Owens Lake to be compared with the costs elsewhere. These costs can be calculated for the entire 43 square mile project, as well as for the 13.2 square miles ordered by this 2008 SIP. By annualizing the estimated capital costs over 25 years ($510 million total cost, interest = 5%, n = 25 years, A/P = 0.07—annualized construction cost = $36 million) and using the above annual operation and maintenance cost estimate ($41.5 million), the 25-year total annualized cost for Owens Lake dust controls is $77.7 million per year. In Table 7.1 the emission reductions from the 29.8 square mile 2007 control area are estimated at 75,180 tons. The emission reduction estimate for the 13.2 square mile 2010 control area is 30,451 tons (Table 7.1). The combined annual uncontrolled emissions for the 43 square miles of dust control area is 105,559 tons. This gives a cost of $736 per ton of PM_{10} controlled for the entire 43 square miles and $716 per ton for the 13.2 square mile ordered in this SIP. These calculations are summarized in Table 7.2.

Table 7.2 – Summary of construction costs, annual costs and cost per ton of PM_{10} controlled

DCM Date	Area (sq. mi.)	% of Total	Construct (M)	Annualized* Const (M)	Annual O&M (M)	Total Annual (M)	Tons/ Year**	**Cost Ton**
2007	29.8	69%	$415	$29.5	$28.6	$58.1	75,180	**773**
2010	13.2	31%	$125	$8.9	$12.9	$21.8	30,451	**716**
Totals	43.0	100%	$510	$36.2	$41.5	$77.7	105,559	**736**

* Interest = 5%, Life = 25 years, A/P = 0.071

** Tons/Year comes from Table 7.1

Recent analyses by the San Joaquin Valley Unified Air Pollution Control District estimate the cost of controlling windblown dust at between $7,700 and $65,000 per ton (SJVUAPCD, 2003). In the South Coast Air Quality Management District (which includes the City of Los Angeles) a fugitive dust control measure is considered cost feasible for PM_{10} Best Available Control Measures if cost-effectiveness is less than $5,300 per ton (SCAQMD, 1994). Therefore, the cost of controlling PM_{10} emissions from the bed of Owens Lake is about 7 to 80 times less, on a per ton basis, than the costs for control elsewhere in California.

The District estimates that the Proposed Project will create as many as 200 jobs during construction. The City has created about 65 new long-term jobs at Owens Lake for the operation and maintenance of the existing 29.8 square miles of controls. The additional 13.2 square miles of controls required by this 2008 SIP are expected to raise the total City jobs at Owens Lake to about 70 (LADWP, Bamossy, 2007).

7.15 REDUCING IMPLEMENTATION COSTS

During the course of implementing the control strategy, experience and ongoing studies will continue to provide knowledge that will help reduce the cost of implementing the control measures. The City will continue to gain additional experience, while constructing and operating the control measures on the playa that will help to reduce costs associated with the control measures. The newly proposed Moat & Row control and the concepts set forth to reduce water use on Shallow Flood areas (shoulder season adjustments and minimum dust control efficiencies) are examples of cost- and water-saving measures proposed by the City. The proposed allowance for adjustments to BACM, discussed in Section 7.9 and Attachment D to the Board Order, provide both the time and the control measure flexibility to ensure that dust control measure efficiencies will improve over time.

7.16 EXISTING RULES AND REGULATIONS TO CONTROL PM_{10}

The focus of the discussion in the 2008 SIP control strategy is on controls for Owens Lake, which are regulated under California Health & Safety Code §42316. This is discussed in more detail in Section 2.2.2.2, Section 7.12 and in Chapter 8. Other sources that contribute PM_{10}, such as industrial sources, forest management burning (see Section 4.2.4 regarding prescribed burning), and other fugitive dust sources are covered under existing District Rules. These rules are listed in Table 7.3 for sources other than Owens Lake. Methods to control fugitive dust and to comply with these rules are included in permits to operate for industrial sources.

7.16.1 Fugitive Dust Regulations

It should be noted that contractors involved in the implementation of the 2008 SIP control strategy are subject to these District rules and regulations regarding fugitive dust control. District Rules 400 and 401 limit visible emissions and require that reasonable precautions be taken to control fugitive dust from activities such as road building, grading, gravel mining and hauling. Mitigation measures to control fugitive dust associated with the implementation of DCMs on the lake bed are discussed in the Environmental Impact Report for the 2003 and 2008 SIPs (GBUAPCD, 2003g and GBUAPCD, 2008). Any gravel mining and hauling activities will be required to apply for an Authority to Construct and obtain a Permit to Operate from the District. The permit will include Conditions of Approval. As discussed in Section 7.7, District Rule 401.D requires the City to implement dust control measures on lake bed areas that cause or contribute to monitored violations of the state PM_{10} standard in any community surrounding Owens Lake.

7.16.2 Transportation Conformity

Transportation conformity requirements, contained in District Regulation XII, require that federal actions and federally funded projects conform to SIP rules and that they do not interfere with efforts to attain federal air quality standards. The emissions inventory shows very low PM_{10} emissions from mobile sources and transportation-related activities in the Planning Area. However, fugitive dust from construction-related activities in areas along Highway 395 have caused significant dust events in the Planning Area. For transportation conformity purposes, PM_{10} emissions from construction-related activities will be quantified as required by District Rule 1231(e) for any new highway construction projects in the OVPA, and will be subject to District Rules 400 and 401 for controlling fugitive dust.

7.16.3 General Conformity

General conformity requirements contained in District Regulation XIII require that federal actions and federally funded projects conform to SIP rules and that they do not interfere with efforts to attain federal air quality standards. Prescribed burning activities will take place on federal lands for forest management and private lands for rangeland improvement and wildland management purposes. The burn season for prescribed burning is expected to last about 60 days per year and daily average emissions will be about 42.2 tons per day (Section 4.2.4). The inclusion of these emission estimates for prescribed burning is for SIP conformity purposes to ensure that prescribed burning activities in the nonattainment area have been considered in the Owens Valley PM10 SIP attainment demonstration.

Prescribed burning activities are not expected to take place on windy days when Owens Lake dust storms occur. Predicted high wind days are avoided when performing prescription burns for fire safety reasons. In addition, prescribed burning is regulated through District Rules 410 and 411 for wildland and forest management burning. These rules require that a burn plan be submitted to the Air Pollution Control Officer prior to conducting the burn, and that burning will not cause or contribute to violations of the air quality standards. For General Conformity purposes, all prescribed burns in the OVPA will be limited to 42.2 tons of PM10 per day. If prescribed burning is done in a manner that complies with District rules, burning activities are not expected to interfere with attainment of the PM10 NAAQS in the Owens Valley.

7.17 AUTHORITY AND RESOURCES

Under California Health & Safety Code §42316, the District is authorized to require the City of Los Angeles to undertake reasonable control measures to mitigate the air quality impacts of its activities in the production, diversion, storage or conveyance of water. The control measures may only be required on the basis of substantial evidence that the water production, diversion, storage or conveyance of water by the City causes or contributes to violations of state or federal ambient air quality standards. In addition, the control measures shall not affect the right of the City to produce, divert, store or convey water.

The District has found that the control measures required under this plan are reasonable and that, on the basis of substantial evidence, the City's water production, diversion, storage or conveyance causes or contributes to violations of state or federal ambient air quality standards in the Owens Valley Planning Area. Also, the District has concluded that the required control measures do not affect the right of the City to produce, divert, store or convey water. On this basis, the District has authority, directly under state law, to issue orders directing the City of Los Angeles to implement the control strategy described in this plan. Those orders are enforceable by the District under state law. California Health & Safety Code §42402 provides that the District may impose civil penalties of up to $10,000 per day against a person who violates any order issued pursuant to California Health & Safety Code §42316. In addition, under California Health & Safety Code §41513, the District is empowered to bring a judicial action in the name of the People of the State of California to enjoin any violation of its orders. These District authorities under state law apply to the enforcement of the specific requirements set forth in this 2008 SIP, as well as to any subsequent actions that may be necessary as contingency measures to ensure the City takes all reasonable actions to bring the Owens Valley PM_{10} Planning Area into attainment with the NAAQS.

The District has the financial resources to enforce compliance with the plan. California Health & Safety Code §42316 authorizes the District annually to assess and collect reasonable fees from the City of Los Angeles. The amount of the fees is set by the District, based on an estimate of the actual costs to the District of its activities associated with the development of air pollution control measures and related air quality analysis, pertaining to the air quality impacts of the City's production, diversion, storage or conveyance of water. Enforcement of the requirements

Table 7.3 Existing rules and regulations to control sources of PM_{10}.	
District Rule	**Description**
209-A	Requires new sources with PM_{10} emissions greater than 250 pounds per day of total suspended particulates, or facility modifications of greater than 15 tons per year of PM_{10} to apply Best Available Control Technology to control PM emissions.
400	Limits visible emissions from any source, except those exempted under Rule 405, to less than Ringelmann 1 or 20% opacity.
401	Requires that reasonable precautions be taken to prevent visible particulate emissions from crossing the property boundary. Requires the City of Los Angeles to implement dust control measures at Owens Lake in order to prevent monitored violations of the state PM_{10} standard in communities.
402	Prohibits sources of air pollution from causing a nuisance to the public or endangering public health and safety.
408	Limits agricultural burning operations to designated burn days and requires a burn permit.
409	Limits range improvement burning to designated burn days and requires that a burn plan be approved by the APCO.
410	Limits forest management burning to designated burn days and requires that a burn plan be approved by the APCO.
411	Limits wildland management burning to designated burn days and requires that a burn plan be approved by the APCO.
Reg. XII	Requires that federal actions and federally funded transportation-related projects conform to SIP rules and that they do not interfere with efforts to attain federal air quality standards.
Reg. XIII	Requires that federal actions and federally funded projects conform to SIP rules and that they do not interfere with efforts to attain federal air quality standards.

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of this plan is a cost that the District may properly include in the estimate it develops as a basis to impose its annual fees under California Health & Safety Code §42316. Such enforcement costs include salaries and expenses of appropriate personnel and attorneys' fees incurred in enforcing provisions of the plan and defending the District in challenges to the plan and its adoption. As with the control measures, the District's orders to pay fees are enforceable under state law. The District may impose civil penalties of up to $10,000 per day and seek injunctive relief if any of its fee assessments are not timely and fully paid. Moreover, although state law permits the City to appeal an order imposing fees to the California Air Resources Board, the Court of Appeal of the State of California has ruled that the appeal does not stay the City's obligation to pay the fees on time (City of Los Angeles, et al. v. Superior Court of Kern County (1998) Cal. Court of Appeal, 5th App. Dist., Case F029795).

7.18 REFERENCES

GBUAPCD, 1997. Great Basin Unified Air Pollution Control District, Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Final Environmental Impact Report, GBUAPCD, Bishop, California, July 2, 1997.

GBUAPCD, 2003. Great Basin Unified Air Pollution Control District, Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan - 2003 Revision, GBUAPCD, Bishop, California, November 13, 2003.

GBUAPCD, 2003c. Great Basin Unified Air Pollution Control District, 2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Draft Environmental Impact Report, State Clearing House Number 2002111020, GBUAPCD, Bishop, California, July, 2003.

GBUAPCD, 2003g. Great Basin Unified Air Pollution Control District, 2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Final Integrated Environmental Impact Report, State Clearing House Number 2002111020, GBUAPCD, Bishop, California, February 2004.

GBUAPCD, 2006b. Great Basin Unified Air Pollution Control District, Settlement Agreement between the District and the City to resolve the City's challenge to the District's Supplemental Control Requirement determination issued on December 21, 2005 and modified on April 4, 2006, GBUAPCD, Bishop, California, December 4, 2006.

GBUAPCD, 2007b. Great Basin Unified Air Pollution Control District, 2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Draft Subsequent Environmental Impact Report, State Clearing House Number 2007021127, GBUAPCD, Bishop, California, September 14, 2007.

LADWP, Bamossy, 2007. Personal Communication between Theodore Schade, GBUAPCD and Wayne Bamossy, Los Angeles Department of Water and Power, July 24, 2007.

LADWP, Harasick, 2007. LADWP Comments on Screen Check of Draft 2008 SIP. Transmitted to T.D. Schade by Richard Harasick via e-mail on August 31, 2007, hardcopy dated September 10, 2007.

Ono and Richmond, 2007. Duane Ono and Ken Richmond. Air Quality Model Evaluation of the Shallow Flood Ramping Flow Strategy. Great Basin Unified Air Pollution Control District, Bishop, California, September 2007.

SCAQMD, 1994. South Coast Air Quality Management District, Best Available Control Measures PM_{10} State Implementation Plan for the South Coast Air Basin, September 1994.

SJVUAPCD, 2003. San Joaquin Valley Unified Air Pollution Control District, Final BACM Technological and Economic Feasibility Analysis. March 21, 2003.

USEPA, 2007a. United States Environmental Protection Agency, Proposed Finding of Failure to Attain; State of California, Owens Valley Nonattainment Area; Particulate Matter of 10 Microns or Less, EPA-R09-OAR-2007-0091, FRL-8291-1, Federal Register, Volume 72, No. 56, March 23, 2007, pp 13723-13726.

CHAPTER 8

Enabling Legislation to Implement Control Strategy

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Enabling Legislation to Implement Control Strategy

8.1 CONTROL STRATEGY IMPLEMENTATION

Under California Health & Safety Code Section 42316 (see following page, Section 2.2.2.2 and Section 7.12), the Great Basin Unified Air Pollution Control District (District) will adopt an order to the City of Los Angeles to implement the "2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan" (2008 SIP) PM_{10} control measures on the schedule included below. The schedule will require that implementation of the additional PM_{10} control measures take place over about a two-year period with completion by April 1, 2010. The Board order to implement the control strategy is incorporated into this 2008 SIP and will be adopted concurrently with the approval of this 2008 SIP.

The order requires the City of Los Angeles (City) to implement Shallow Flooding, Managed Vegetation and/or Gravel Blanket, with an option for limited areas of Moat & Row within the areas shown in and described by Exhibit 1, below. Implementation under the Board's order also ensures compliance with the California Environmental Quality Act (CEQA). This includes specified environmental mitigation measures, and environmental monitoring and reporting requirements as set forth in the Environmental Impact Report (EIR) prepared for the 2008 SIP. Although the District has prepared a project-level EIR with the intention that it be used both in association with the District's adoption of this 2008 SIP and the City's award of construction contracts for the implementation of PM_{10} control measures, it is possible that the City may need to prepare environmental documents in addition to the 2008 SIP EIR in order to lawfully complete implementation of the proposed control strategy. The preparation of any such documents are the sole responsibility of the City. In addition, the City is solely responsible for securing all approvals, permits and leases required to implement the PM_{10} control measures.

The Attainment Demonstration in Chapter 7 shows that, based on data collected during the four-year period between July 2002 and June 2006, implementing the PM_{10} controls required in this 2008 SIP will provide for the Owens Lake bed to attain the National Ambient Air Quality Standards everywhere above the historic shore line (3600 foot elevation).

Text of California Health & Safety Code §42316

H&S Sec. 42316. Authority to require City of Los Angeles to mitigate air quality impacts of its water production, storage, or conveyance; Fees

(a) The Great Basin Air Pollution Control District may require the City of Los Angeles to undertake reasonable measures, including studies, to mitigate the air quality impacts of its activities in the production, diversion, storage, or conveyance of water and may require the city to pay, on an annual basis, reasonable fees, based on an estimate of the actual costs to the district of its activities associated with the development of the mitigation measures and related air quality analysis with respect to those activities of the city. The mitigation measures shall not affect the right of the city to produce, divert, store, or convey water and, except for studies and monitoring activities, the mitigation measures may only be required or amended on the basis of substantial evidence establishing that water production, diversion, storage, or conveyance by the city causes or contributes to violations of state or federal ambient air quality standards.

(b) The city may appeal any measures or fees imposed by the district to the state board within 30 days of the adoption of the measures or fees. The state board, on at least 30 days' notice, shall conduct an independent hearing on the validity of the measures or reasonableness of the fees which are the subject of the appeal. The decision of the state board shall be in writing and shall be served on both the district and the city. Pending a decision by the state board, the city shall not be required to comply with any measures which have been appealed. Either the district or the city may bring a judicial action to challenge a decision by the state board under this section. The action shall be brought pursuant to Section 1094.5 of the Code of Civil Procedure and shall be filed within 30 days of service of the decision of the state board.

(c) A violation of any measure imposed by the district pursuant to this section is a violation of an order of the district within the meaning of Sections 41513 and 42402.

(d) The district shall have no authority with respect to the water production, diversion, storage, and conveyance activities of the city except as provided in this section. Nothing in this section exempts a geothermal electric generating plant from permit or other district requirements.

(Added by Stats. 1983, Ch. 608, Sec. 1. Effective September 1, 1983.)

Text of CH&SC §42316 that allows the District to assess fees for studies and order mitigation measures to implement the SIP control strategy.

8.2 THE BOARD ORDER

The following order of the Governing Board of the Great Basin Unified Air Pollution Control District is incorporated into this 2008 State Implementation Plan and constitutes an integral part thereof:

BOARD ORDER # 080128-01
REQUIRING THE CITY OF LOS ANGELES TO UNDERTAKE MEASURES TO CONTROL PM_{10} EMISSIONS FROM THE DRIED BED OF OWENS LAKE

With regard to the control of PM_{10} emissions from the bed of Owens Lake, the Governing Board of the Great Basin Unified Air Pollution Control District (District) orders the City of Los Angeles (City) as follows:

PREAMBLE

A. WHEREAS, the 1998 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan (1998 SIP), dated November 16, 1998 and the 2003 Revision to the Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan (2003 SIP), dated November 13, 2003, require the City to implement a series of measures and actions to reduce particulate emissions from the Owens Lake bed such that the Owens Valley Planning Area (OVPA) will attain and maintain the federal 24-hour National Ambient Air Quality Standards (NAAQS) for particulate matter (PM_{10}) by the statutory deadlines;

B. WHEREAS, the District is required by law to maintain its discretion to protect the environment, public health and safety, and this Order is intended to fulfill those duties without improperly constraining that lawful exercise of discretion;

C. WHEREAS, based on additional information collected subsequent to the information used to adopt the 1998 SIP and 2003 SIP, the District has determined that additional measures and actions will be required to continue to reduce particulate emissions in the OVPA such that the OVPA will attain and maintain the federal 24-hour NAAQS for PM_{10} by the statutory deadlines;

D. WHEREAS, in 2006 a dispute arose between the District and the City regarding the District's requirements for the City to control dust from additional areas at Owens Lake beyond those areas identified in the 2003 SIP;

E. WHEREAS, on December 4, 2006 a Settlement Agreement was approved by both the District and the City. Under the provisions of this agreement, the City agreed to implement additional dust control measures by April 1, 2010 and the District agreed to revise the 2003 SIP before March 1, 2008 to incorporate the provisions of the Settlement Agreement;

F. WHEREAS, on March 23, 2007, the U.S. Environmental Protection Agency (USEPA) published a finding that the Owens Valley Planning Area did not attain the 24-hour NAAQS for particulate matter of 10 microns or less (PM_{10}) by December 31, 2006 as mandated by the U.S Clean Air Act Amendments of 1990;

G. WHEREAS, as a result of the USEPA finding, the 2003 SIP must be revised to include a control strategy that will provide for attainment in the Owens Valley Planning Area as soon as practicable and that said revised SIP must be submitted to the USEPA by December 31, 2007;

H. WHEREAS, in consideration of the District's continuing duties under federal and state law, including but not limited to the Clean Air Act, to control particulate emissions from the Owens Lake bed without interruption, the District intends, if this Order is stayed or disapproved, that Board Order #031113-01 (adopted on November 13, 2003) shall continue to be in effect, so that at all times there will be continuous control of these emissions;

I. WHEREAS, the District thereby intends that if this Order is stayed due to a legal challenge, including but not limited to a challenge to this Order under California Health and Safety Code Section 42316, to the State Implementation Plan, or to the Environmental Impact Report for this SIP, or if this Order is disapproved by the California Air Resources Board (CARB), the District will revert to enforce the terms of Board Order #031113-01 which shall continue to be in effect and shall remain in full force for the duration of any stay or, in the case of disapproval, unless and until another Order is issued by this Board; and

J. WHEREAS, to prevent the deterioration of air quality due to dismantling or "backsliding" on control measures that have already been implemented before any such stay or disapproval, the District intends that the City shall continue to operate and maintain all control measures already implemented at the time of any such stay or disapproval without interruption, unless and until a further Order of the District allows for such interruption, if the City has not appealed the control measures under Section 42316 within 30 days of the effective date of this Order, and if those control measures were not invalidated as a result of that appeal;

K. WHEREAS, it is the District's intention that this 2008 revised SIP is consistent with the 2006 Settlement Agreement between the District and the City and that it is the District's intention to independently meet all its commitments and obligations under said Settlement Agreement.

THEREFORE, IT IS HEREBY ORDERED AS FOLLOWS:

ORDER

IMPLEMENTATION OF OWENS LAKE BED PM_{10} CONTROL MEASURES

1. Existing PM_{10} controls – From the date of adoption of this order, the City shall continue to operate and maintain the existing Best Available Control Measures (BACM) for PM_{10}, as described in Paragraph 8 hereof, on 29.8 square miles of the Owens Lake bed within the 2003 Dust Control Area (DCA) delineated in Exhibit 1.

2. Additional Shallow Flood supplemental PM_{10} controls – By April 1, 2010 the City shall implement a minimum of 9.2 square miles of additional Shallow Flooding BACM PM_{10} controls within the 12.7 square-mile area known as the 2006 Supplemental Dust Control Area (SDCA) delineated in Exhibit 1. The areas within the SDCA designated for Shallow Flooding only are delineated in Exhibit 1. Shallow Flooding BACM is described in Paragraphs 8, 9 and 15 hereof.

3. Other additional supplemental PM_{10} controls – On a maximum of 3.5 square miles within the 2006 SDCA delineated in Exhibit 1, the City shall implement BACM for PM_{10}, as described in Paragraphs 8, 9 and 15 through 17 hereof, or the City may implement the alternative non-BACM PM_{10} control measure known as "Moat & Row," as described in Paragraph 18. If BACM are installed, the controls shall be operational by April 1, 2010. If Moat & Row is installed, it shall be operational by October 1, 2009.

4. Channel Area PM_{10} controls – A 0.5 square-mile area of natural drainage channels on the south area of the Owens Lake bed is known as the "Channel Area" and is delineated in Exhibit 1. The City shall control PM_{10} emissions from the Channel Area by implementing and operating BACM, modified-BACM or alternative non-BACM controls approved by the District's Air Pollution Control Officer (APCO), that take into account the resource issues in the Channel Area, by April 1, 2010. Portions of the Channel Area that are determined by the APCO to be naturally non-emissive (for example, adequately vegetated areas) will not require controls. If BACM are implemented in the Channel Area, they shall be as described in paragraphs 8, 9 and 15 through 17 hereof. If the City seeks to implement modified-BACM or alternative non-BACM, the City will apply such modifications as are permissible to resource agencies in this channel, with the primary objective of controlling dust, and provide the District with a monitoring plan aimed at identifying source areas that could cause or contribute to shoreline violations. Should such areas be identified after facilities are fully operational (including vegetative development), the District and the City will work with resource agencies to develop site-specific and implementable dust control approaches. Regardless of the approach selected for Channel Area dust control, the City shall prepare and submit to the District a detailed plan demonstrating the need and effectiveness of the control measures and their projected impacts to the environment, and obtain the prior approval of the District and any other applicable regulatory agencies with jurisdiction over the Channel Area for use of the modified-BACM. The City shall be responsible for any additional environmental analyses that may be required and for all required permits.

5. Total PM_{10} control area – The 29.8 square-mile 2003 Dust Control Area (DCA), the 12.7 square-mile 2006 Supplemental Dust Control Area (SDCA) and the 0.5 square-mile Channel Area together comprise the 43.0 square-mile area known as the 2008 Total Dust Control Area (TDCA). These PM_{10} control areas are delineated in Exhibit 1.

6. Minor adjustments to PM_{10} control area boundaries – Upon written request by the City to the District and written approval by the District's APCO, minor adjustments may be made to the interior and exterior boundaries of the 2006 SDCA, for example to avoid impacts to existing resources or features, or for constructability reasons, which approval shall not be unreasonably withheld. In the event of such modification, the boundaries of the 2008 TDCA shall also be modified to reflect the modified 2006 SDCA boundaries.

7. Study Areas – The District has identified four additional "Study Areas" on the Owens Lake bed totaling up to 1.85 square miles that may require some level of control in order to attain the PM_{10} NAAQS. The four Study Areas are delineated in Exhibit 1. The District will study emissions from the Study Areas occurring between July 1, 2006 and April 1, 2010 to determine whether they will cause or contribute to PM_{10} NAAQS exceedances such that controls will be required. The District will use the data collected during this period to make a determination after May 1, 2010 as to the need for additional controls, as set forth in Paragraph 10, below. However, if the City is not in compliance with Paragraphs 1 and 3 of this Order, the determination as to the need for additional controls in the Study Areas may be made prior to May 1, 2010.

PM_{10} CONTROL MEASURES

8. The City shall implement BACM PM_{10} control measures as set forth in this Order, described below in Paragraphs 15 through 17. The City may implement the alternative non-BACM PM_{10} control measure as set forth in this Order, described below in Paragraph 18. To complete implementation of a specified control measure by a date as required by this Order means that the control measure shall be constructed, installed, operated and maintained without interruption, so as to comply with the performance standards for the specified control measure not later than 5:00 p.m. on the required date.

9. All PM_{10} control measures within the 2006 SDCA shall be designed, constructed, installed, operated and maintained by the City to achieve the initial target minimum dust control efficiencies (MDCEs) shown on the MDCE Map, attached as Exhibit 2. MDCEs are the actual dust control measure control efficiencies required to meet the PM_{10} NAAQS, based on data collected during the four-year period between July 2002 and June 2006. Prior to April 1, 2010, upon request of the City and written approval of the APCO, which approval shall not be unreasonably withheld, the initial target MDCEs may be modified if the modified target MDCEs meet the criteria set forth in the MDCE Selection Process Spreadsheet, as set forth in the 2006 Settlement Agreement between the District and the City. This Settlement Agreement is attached as Attachment A.

CONTINGENCY MEASURES – SUPPLEMENTAL CONTROL DETERMINATIONS

10. At least once per calendar year after May 1, 2010, the District's APCO will make a written determination as to whether any areas, in addition to those described in Exhibit 1, require air pollution control measures in order to attain or maintain compliance with the NAAQS for PM_{10}. The APCO's determination will also contain an analysis of the minimum dust control efficiency provided by the PM_{10} controls in the 2008 TDCA to determine if a higher level of control efficiency is required in order to attain or maintain compliance with the NAAQS for PM_{10}. In making these determinations, the APCO shall employ the methods described in Paragraph 11 of this Order. If the City is not in compliance with Paragraphs 1 and 3 of this Order, the determination as to the need for additional controls may be made prior to May 1, 2010.

    A. If the APCO determines under this Paragraph that additional areas require air pollution control measures or that existing PM_{10} control measures require a higher level of control efficiency, the APCO shall issue a written determination to the City informing them that the provisions of Paragraph 11 of this Order require the City to implement, install, operate and maintain PM_{10} BACM on additional areas of the Owens Lake bed or that the control efficiency on existing PM_{10} controls must be increased. The determination will identify those areas of the lake bed that will require PM_{10} BACM and the control efficiency necessary to attain the PM_{10} NAAQS. The City shall secure all permits and leases necessary to implement BACM and conduct any additional analysis, if any, required to comply with the California Environmental Quality Act and any other applicable laws.

B. The APCO's annual determinations will use data collected after April 1, 2010, except as provided in Paragraph 7, above, for the four Study Areas. The annual determinations for the Study Areas will use data collected after July 1, 2006.

C. In the event the City appeals the supplemental control determination under Health & Safety Code Section 42316, and pending a decision of the CARB, the City is not required to comply with any measure imposed by the supplemental control determination. The District relies upon action by the CARB to issue its decision on the City's appeal within 90 days. If CARB does not affirm the District supplemental control determination, or otherwise require the City to immediately undertake alternative supplemental control measures within 90 days in such circumstances where automatic control measures are required under Sections 172(c)(1) or 182(c)(9) of the federal Clean Air Act, 42 U.S.C. Sections 7502(c)(9) and 7511a(c)(9), the District relies upon the CARB to take these federal requirements into account in its determination of the City's appeal and to issue such interim orders as necessary to implement automatic supplemental control measures so that this Order complies with the Clean Air Act and can be approved by the U.S. Environmental Protection Agency as a proper State Implementation Plan. The foregoing is not intended to provide the CARB with any authority other than its authority under state law.

D. Paragraph 11 fixes the period of time within which the implementation of the additional control measures must be completed. Upon implementation, the City shall continuously operate and maintain, without interruption, the control measures to comply with performance standards set forth for such measures in the control measure descriptions contained in this Order.

CRITERIA FOR DETERMINING THE NEED FOR ADDITIONAL PM_{10} CONTROLS

11. The criteria, methods and procedures for the APCO's determination of the need for additional PM_{10} controls described in Paragraph 10 shall be those described in detail in the "2008 Owens Valley Planning Area Supplemental Control Requirements Determination Procedure" document incorporated as Attachment B along with its referenced "2008 Owens Lake Dust Source Identification Program Protocol" incorporated as Attachment C.

NEW BACM, ADJUSTMENTS TO EXISTING BACM, AND BACM TRANSITIONS

12. Upon written request by the City, the APCO may approve new BACM, a modification or adjustment to the existing BACMs described in Paragraphs 15, 16 and 17 of this Order, and/or the transition from one BACM to another provided that, at all times, the performance standards of one or the other BACM are continuously met during the transition to assure that the transition shall not prevent the OVPA from attaining or maintaining the NAAQS for

PM_{10}. The City's request shall contain a detailed description of the proposed alternative and a demonstration that the request satisfied all requirements of law and this Order. The APCO shall have full discretion to consider any such application for a change in BACM, and to accept, reject or condition its approval of such application. Non-compliance with any such condition shall be enforceable as noncompliance with a District Order. Without limiting the District's discretion as provided herein, the procedures for transitions of implemented control measures or adjustments to BACM shall be those described in Attachment D, "2008 Procedure for Modifying Best Available Control Measures (BACM) for the Owens Valley Planning Area."

ALTERNATIVE METHODS FOR IMPLEMENTING CONTINGENCY MEASURES AND SUPPLEMENTAL CONTROLS

13. Notwithstanding any other provision of this Order, the District shall maintain its authority under Health and Safety Code Section 42316 to order the City to implement additional controls, to control additional emissive areas and/or to undertake additional reasonable measures necessary to mitigate the air pollution caused in the District by the City's water-gathering activities in order to prevent the OVPA from failing to attain or maintain the NAAQS for $PM_{10,}$ if circumstances arise that are not specifically addressed in Paragraphs 10 or 12 of this Order.

RELATIONSHIP TO BOARD ORDER 031113-01

14. The District hereby stays the force and effect of Board Order 031113-01 for all times that this Order is in full force and effect. In the event this Order, or any provision of this Order, is stayed due to a legal challenge, including but not limited to a challenge to this Order under Health & Safety Code Section 42316, or any other law, to the State Implementation Plan, or to the Environmental Impact Report for this Revised SIP, or in the event the Order is disapproved by the CARB, the following shall apply:

    A. If the stay or disapproval causes Paragraph 1 through 5 of this Order to cease its operative force and effect, Board Order #031113-01 shall immediately be in effect and shall remain in full force for the duration of any stay or, in the case of disapproval, until another Order is issued by this Board. In addition, the City shall continue to operate and maintain without interruption all control measures already implemented in any area if those control measures were not appealed under Health & Safety Code Section 42316 within 30 days of the date of this Order, and if those measures were not invalidated as a result of that appeal.

    B. If the stay or disapproval causes Paragraph 10 and/or 11 of this Order to cease its operative force and effect, but does not affect Paragraphs 1 through 5 of this Order, the City shall continue to operate and maintain all control measures already implemented without interruption.

    C. If the stay or disapproval does not affect Paragraphs 1 through 7, 10 or 11 of this Order, those Paragraphs and any other terms of this Order that are not stayed or disapproved shall be in effect, and shall remain in full force for the duration of any stay. In all cases, the City shall continue to operate and maintain, without interruption, all control measures already implemented.

D. If a stay of this Order is imposed, then lifted so that this Order is in effect, the City shall, immediately, meet all requirements and deadlines set by this Order as if no stay had been imposed. The City shall not remove or decrease any control measures without the express written permission of the APCO, and the provisions of Board Order 031113-01 shall again be stayed. If the stay of this Order is only partially lifted such that any portion of this Order remains stayed, Board Order 031113-01 shall remain in effect as provided under Paragraphs 14.A., 14.B. and 14.C, above.

PM_{10} CONTROL MEASURES

15. BACM Shallow Flooding

The "Shallow Flooding" PM_{10} control measure will apply water to the surface of those areas of the lake bed where Shallow Flooding is used as a PM_{10} control measure. Water shall be applied in amounts and by means sufficient to achieve the following performance standards:

A. For Shallow Flooding areas within the 29.8 square-mile 2003 DCA:

i. Until April 1, 2010: At least 75 percent of each square mile of the designated areas shall continuously consist of standing water or surface-saturated soil, substantially evenly distributed for the period commencing on October 1 of each year, and ending on June 30 of the next year. If a contiguous Shallow Flood dust control area is less than one square mile, 75 percent of the entire contiguous area shall consist of substantially evenly distributed standing water or surface-saturated soil.

ii. After April 1, 2010:

a. At least 75 percent of each square mile of the designated areas shall continuously consist of standing water or surface-saturated soil, substantially evenly distributed for the period commencing on October 16 of each year, and ending on May 15 of the next year. If a contiguous Shallow Flood dust control area is less than one square mile, 75 percent of the entire contiguous area shall consist of substantially evenly distributed standing water or surface-saturated soil.
b. Beginning May 16 and through May 31 of every year, Shallow Flooding areal wetness cover may be reduced to a minimum of 70 percent.
c. Beginning June 1 and through June 15 of every year, Shallow Flooding areal wetness cover may be reduced to a minimum of 65 percent.
d. Beginning June 16 and through June 30 of every year, Shallow Flooding areal wetness cover may be reduced to a minimum of 60 percent.
e. If for any Shallow Flooding area, the percent of areal wetness cover in the periods specified in Paragraphs 15.A.ii,b, c, and d, above, is below the minimum percentages specified for each shallow flood area based on the air quality model for the analysis period from July 2002 through June 2006, and there were no monitored or modeled exceedances of the federal standard at the historic shoreline, that area will be deemed to be in compliance, if the City demonstrates in writing and the APCO reasonably determines in writing that maximum water delivery mainline flows were maintained throughout the applicable period.

B. For Shallow Flooding areas within the 12.7 square-mile 2006 SDCA:

   i. The percentage of each area that must have substantially evenly distributed standing water or surface-saturated soil shall be based on the Shallow Flood Control Efficiency Curve (SFCE Curve) attached as Exhibit 3 to achieve the control efficiency levels in the MDCE Map (Exhibit 2).

   ii. For Shallow Flooding areas with control efficiencies of 99 percent or more:

      a. Beginning May 16 and through May 31 of every year, Shallow Flooding areal wetness cover may be reduced to a minimum of 70 percent.
      b. Beginning June 1 and through June 15 of every year, Shallow Flooding areal wetness cover may be reduced to a minimum of 65 percent.
      c. Beginning June 16 and through June 30 of every year, Shallow Flooding areal wetness cover may be reduced to a minimum of 60 percent.
      d. If for any Shallow Flooding area, the percent of areal wetness cover in the periods specified in Paragraph 15.B.ii.a,b, and c, above, is below the minimum percentages specified for each shallow flood area based on the air quality model for the analysis period from July 2002 through June 2006, and there were no monitored or modeled exceedances of the federal standard at the historic shoreline, that area will be deemed to be in compliance if the City demonstrates in writing and the APCO reasonably determines in writing that maximum water delivery mainline flows were maintained throughout the applicable period.

C. Beginning on April 1, 2010, if modeled or monitoring data shows an exceedance or exceedances of the PM_{10} NAAQS at the historic shoreline as a result of excessive dry areas within Shallow Flooding control areas during the dust control periods for each year between October 1 and June 30 of the next year, the provisions of Paragraph 10 shall apply.

D. From July 1 through September 30 of each year, the City is not required by the 2008 SIP to apply water to Shallow Flooding areas for dust control purposes, but is required to maintain minimum areal wetness cover as required by applicable environmental documents, permits, leases and approvals.

E. Aerial photography, satellite imagery or other methods approved at the sole discretion of the APCO shall be used to confirm wetness coverage.

F. The following portions of the areas designated for control with Shallow Flooding are exempted from the requirement of dust control by means of a saturated surface:

   i. Raised berms, roadways and their shoulders necessary to access, operate and maintain the control measure which are otherwise controlled and maintained to render them substantially non-emissive and

   ii. Raised pads containing vaults, pumping equipment or control equipment necessary for the operation of Shallow Flooding infrastructure which are otherwise controlled and maintained to render them substantially non-emissive.

G. "Substantially non-emissive" shall be defined to mean that the surface is protected with gravel, durable pavement or other APCO-approved surface protections sufficient to meet the requirements of District Rules 400 and 401 (visible emissions and fugitive dust).

H. Excess surface waters and shallow groundwaters above the annual average water table that existed before site construction that reach the lower boundary of the dust control areas will be contained, collected and recirculated for reapplication to dust control areas or otherwise lawfully discharged. The dust control measure areas shall have lateral boundary edge berms and/or drains as necessary to contain excess waters in the control areas and to isolate the dust control measure areas from each other and from areas not controlled. If drains are used, they shall be designed and constructed so that they may be regulated such that groundwater levels, surface water extent and wetlands in adjacent uncontrolled areas are not impacted. These requirements do not apply to Shallow Flood area T36-4, due to its adjacency to the Lower Owens River Project (LORP) and the City's intention to integrate the design and operation of T36-4 into the LORP.

I. The City shall remove all exotic pest plants, including salt cedar (*Tamarix ramosissima*), that invade any of the areas designated for control by Shallow Flooding.

J. As necessary to protect human health, the City shall prevent, avoid and/or abate mosquito, other pest vector and biting nuisance insect breeding and swarming within and in the vicinity of the control areas, including within communities less than three miles from a PM_{10} control area, by effective means that minimize adverse effects upon adjacent wildlife.

16. <u>BACM Managed Vegetation</u>

A. <u>Existing Managed Vegetation areas</u>
For areas controlled with the Managed Vegetation PM_{10} control measure prior to January 1, 2007, the areas shall be operated and maintained in accordance with a Managed Vegetation Operation and Management Plan to be approved in writing by the APCO, which approval shall not be unreasonably withheld. The requirements of the Plan may be revised upon written request by the City and written approval of the APCO, which approval shall not be unreasonable withheld,. The City's request shall contain a specific description of the modification requested and provide a demonstration regarding the effect of the modification on the environment and PM_{10} control effectiveness.

B. <u>New Managed Vegetation areas</u>
In PM_{10} control areas constructed after January 1, 2007 where Managed Vegetation is used as a PM_{10} control measure, the following performance standard shall be achieved commencing on October 1 of each year, and ending on June 30 of the next year: substantially evenly distributed live or dead vegetation coverage of at least 50 percent on each acre designated for Managed Vegetation.

C. <u>All Managed Vegetation areas</u>

i. The vegetation planted for dust control shall consist only of locally-adapted native species approved by the APCO or other species approved by both the APCO and the California State Lands Commission (CSLC). To date, the only approved locally-adapted native species is saltgrass (*Distichlis spicata*). However, other appropriate species may be approved upon written request of the City and written approval of both the APCO and CSLC.

ii. Vegetation coverage shall be measured by the point-frame method, by ground-truthed remote sensing or by other methods approved at the sole discretion of the APCO.

iii. The following portions of the areas designated for control with Managed Vegetation are exempted from the requirements set forth in Paragraphs 16.A. and 16.B., above:

   a. Portions consistently inundated with water, such as reservoirs, ponds and canals,

   b. Roadways and equipment pads necessary to access, operate and maintain the control measure which are otherwise controlled and maintained to render them substantially non-emissive, and

   c. Portions used as floodwater diversion channels or desiltation/retention basins.

iv. "Substantially non-emissive" shall be defined to mean that the surface is protected with gravel, durable pavement or other APCO-approved surface protections sufficient to meet the requirements of District Rules 400 and 401 (visible emissions and fugitive dust).

v. Excess surface waters and shallow groundwaters above the root zone depths that reach the lower boundary of the dust control areas shall be collected and recirculated for reapplication to dust control areas or otherwise lawfully discharged. The dust control measure areas shall have lateral boundary edge berms and/or drains as necessary to contain excess waters in the control areas and to isolate the dust control measure areas from each other and from areas not controlled. Drains shall be designed and constructed so that they may be regulated such that groundwater levels, surface water extent and wetlands in adjacent uncontrolled areas are not impacted.

vi. To protect the Managed Vegetation control measure from flood damage and alluvial deposition, the City shall incorporate stormwater and siltation control facilities into and around Managed Vegetation areas adequate to maintain the dust mitigation function of Managed Vegetation. The Managed Vegetation protection facilities shall be designed to dissipate flood waters and capture the alluvial material carried by flood waters, so as to avoid greater than normal water flows and deposition of alluvial material into the Owens Lake brine pool.

vii. The City shall remove all exotic pest plants, including salt cedar (*Tamarix* spp.), that invade any of the areas designated for control by Managed Vegetation.

viii. As necessary to protect human health, the City shall prevent, avoid and/or abate mosquito, other pest vector and biting nuisance insect breeding and swarming within and in the vicinity of the dust control areas, including within communities less than three miles from a PM_{10} control area, by effective means that minimize adverse effects upon adjacent wildlife.

17. BACM Gravel Blanket

A. In areas where Gravel Blanket is used as a PM_{10} control measure, the City shall meet the following performance standard: one hundred percent of the control area shall be covered with a layer of gravel at least four inches thick. All gravel material placed must be screened to a size greater than one-half inch (½ inch) in diameter. Where it is necessary to support the gravel blanket, it shall be placed over a permanent permeable geotextile fabric. The gravel shall have resistance to leaching and erosion. It shall be no more toxic than the gravel from the Keeler fan site analyzed by the District in the Final Environmental Report prepared for the 1997 SIP. To minimize visual impacts, all gravel used shall be comparable in coloration to the existing lake bed soils.

B. To protect the Gravel Blanket control measure from flooding, the City shall incorporate drains and channels into and around the control measure areas adequate to maintain the dust mitigation function of the Gravel Blanket, and outlet flood waters into the Owens Lake brine pool, Shallow Flooding areas, or reservoirs. The drains and channels shall be designed to incorporate features such as desiltation or retention basins that are adequate to capture the alluvial material carried by the flood waters and to avoid greater than normal deposition of this material into the Owens Lake brine pool.

C. The gravel placement design and implementation shall adequately protect the graveled areas from the deposition of wind- and water-borne soil or infiltration of sediments from below. All graveled areas will be visually monitored to ensure that the Gravel Blanket is not filled with sand, dust or salt and that it has not been inundated or washed out from flooding. If any of these conditions are observed over areas larger than one acre, additional gravel will be transported to the playa and applied to the playa surface such that the original performance standard is maintained. The City shall apply best available control measures (BACM) and New Source Performance Standard (NSPS) emission limits to its gravel mining and transportation activities occurring within the District's geographic boundaries as required by the District in the City's District-issued Authority to Construct and Permit to Operate.

18. Alternative Non-BACM Moat & Row Control Measure

A. The Moat & Row PM_{10} control measure is not a currently-approved BACM. The preliminary form of Moat & Row is described in Exhibit 4 of the 2006 Settlement Agreement between the District and the City (Attachment A). The final form of the Moat & Row PM_{10} control measure will be determined from the results of a demonstration project and testing to be conducted by the City on the lake bed. All Moat & Row controls will be designed, constructed and operated to achieve the MDCEs described in Paragraph 9.

B. The PM_{10} control effectiveness of Moat & Row may be enhanced by combining it with other dust control methods such as vegetation, water, gravel, or the addition of other features that enhance sand capture and sheltering or directly protect the lake bed surface from wind erosion. The effectiveness of the array can also be increased by adding additional moats and rows to the array.

C. Final design for the Moat & Row control measure will be determined solely by the City after consultation with and written notification to the District. The City shall consider the following elements in its final design:

i. Test results demonstrating that the required MDCE for each Moat & Row area can be met,

ii. Completion of all required environmental documentation, approvals, permits and leases, and

iii. Inclusion of monitoring in the infrastructure design to continuously monitor compliance with the target MDCE for each area.

D. Upon written request of the City, the APCO shall determine in writing if any given Moat & Row design constitutes BACM or MDCE-BACM in accordance with Attachment D, "2008 Procedure for Modifying Best Available Control Measures (BACM) for the Owens Valley Planning Area."

E. Areas of Moat & Row that do not function as designed or that cause or contribute to an exceedance of the federal 24-hour PM_{10} NAAQS will be remediated as specifically provided in Attachment B, the "2008 Owens Valley Planning Area Supplemental Control Requirements Determination Procedure."

PM_{10} CONTROL MEASURE COMPLIANCE AND ENFORCEMENT

19. The District and City will work collaboratively to develop improved wetness and vegetative cover measurement techniques, control efficiency relationships, and compliance specifications for all PM_{10} control measures. Final acceptance and implementation of all compliance measurement techniques and PM_{10} control measure compliance specifications with regulatory impact will be at the sole discretion of the APCO.

STORMWATER MANAGEMENT

20. The City shall design, install, continually operate and maintain flood and siltation control facilities to protect the all PM_{10} control measures installed on the lake bed at all times, and in a manner that groundwater levels, surface water extent, and wetlands in adjacent uncontrolled areas are not impacted by induced drainage. Flood and siltation control facilities shall be integrated into the design and operation of the PM_{10} control measures. All flood and siltation control facilities and PM_{10} control measures damaged by stormwater runoff or flooding shall be promptly repaired and restored to their designed level of protection and effectiveness. All flood and siltation control facilities shall be designed and operated in a manner to prevent any greater threat of alluvial material contamination to the existing trona mineral deposit lease area (State Lands Commission leases PRC 5464.1, PRC 3511 and PRC 2969.1) than would have occurred under natural conditions prior to the installation of PM_{10} control measures.

SCHEDULE

21. The Control Measures shall be implemented on the areas set forth in Paragraphs 1 through 4 by the dates set forth in those Paragraphs. Supplemental Control Requirements shall be met on the schedule provided for in Attachment B.

PERFORMANCE MONITORING PLAN

22. The City, in consultation with the District, shall annually develop and provide to the District in writing a Performance Monitoring Plan (PMP) to aid in its operation of the Owens Lake dust mitigation program on the Owens Lake bed.

    A. The PMP shall describe the measurements and methods used to verify the performance of the constructed DCMs. The PMP shall also describe the measurements and methods used to maximize information on dust emissions from any areas of special interest.

    B. The City shall implement the PMP, and will use the results as a guide for making operational decisions about the type, location, timing, and level of dust control measures needed to prevent exceedances of the federal standard at the shoreline.

    C. The District may use information from the PMP to assist in determining the likely sources of dust emissions causing or contributing to exceedances (if any) of the federal standard at the shoreline.

    D. The PMP for each calendar year shall be submitted to the APCO by March 31 of the following calendar year.

ADDITIONAL REQUIREMENTS

23. The District Board orders the City of Los Angeles to satisfy the following requirements related to the implementation of the Shallow Flooding, Managed Vegetation, Gravel Blanket and Moat & Row control measures:

    A. The City's construction, operation and maintenance activities shall comply with all Mitigation Measures set forth in Final Environmental Impact Reports, EIR Addendums and Mitigated Negative Declarations associated with the areas on which dust controls are placed, and all subsequent environmental documents adopted by the District for implementation of the requirements of this SIP.

    B. The City shall comply with any and all applicable requirements of the Mitigation Monitoring and Reporting Programs adopted by the District and associated with the Final Environmental Impact Reports and Final Environmental Impact Report Addendums for this project, and with all subsequent environmental documents adopted by the District for implementation of the requirements of this SIP. All mitigation measures required in certified environmental documents associated with the implementation, operation and maintenance of PM_{10} control measures required by this order are hereby incorporated as requirements of this order and may be enforced as such.

C. The City shall apply best available control measures (BACM) to control air emissions from its construction/implementation activities occurring in the District's geographic boundaries.

Exhibits

Exhibit 1 Map and Coordinates of PM_{10} Control Areas

Exhibit 2 Minimum Dust Control Efficiency Map

Exhibit 3 Shallow Flood Control Efficiency Curve

Attachments

Attachment A 2006 Settlement Agreement between the Great Basin Unified Air Pollution Control District and the City of Los Angeles

Attachment B 2008 Owens Valley Planning Area Supplemental Control Requirements Determination Procedure

Attachment C 2008 Owens Lake Dust Source Identification Program Protocol

Attachment D 2008 Procedure for Modifying Best Available Control Measures (BACM) for the Owens Valley Planning Area

Exhibit 1 - Map and coordinates of PM_{10} control areas

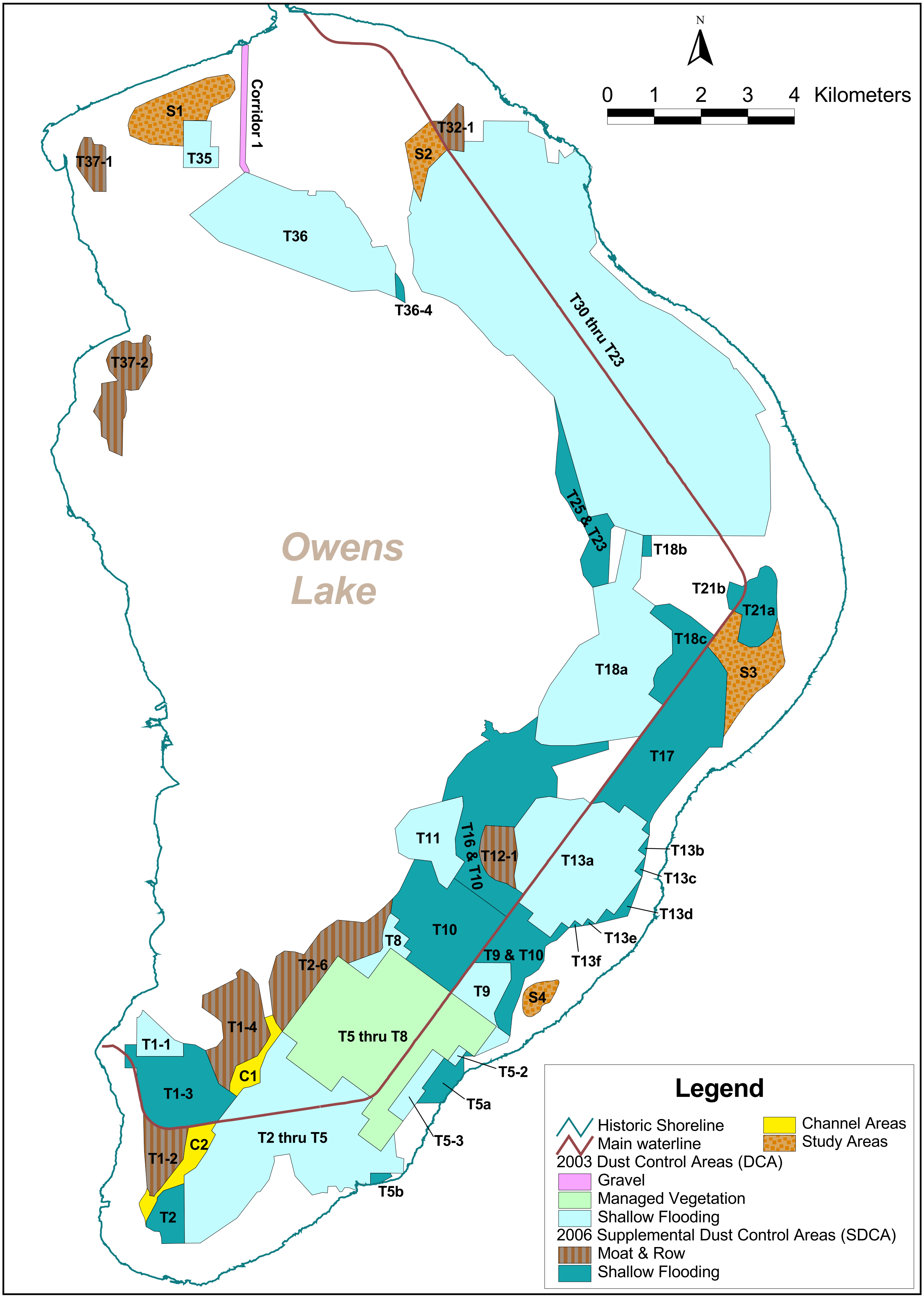

Exhibit 1 - Map and coordinates of PM_{10} control areas

Area ID	Area (miles)	Area type	Coordinates(UTM Zone11 meters NAD83)	
			X-coordinates	Y-coordinates
T32-1	0.17	SDCA	415,639.7810	4,042,385.2695
			415,283.2810	4,043,000.1953
			415,539.4060	4,042,999.0234
			415,866.3750	4,043,383.8359
			415,994.4060	4,043,304.2109
			416,002.6250	4,042,981.9922
			416,005.6250	4,042,568.5234
			416,000.9380	4,042,344.1055
			415,872.2190	4,042,360.3477
			415,645.7500	4,042,391.2070
			415,639.7810	4,042,385.2695
T37-1	0.21	SDCA	408,348.9690	4,041,492.4844
			408,085.5000	4,041,493.3164
			407,718.8130	4,042,027.7422
			407,731.5000	4,042,299.3945
			407,804.9060	4,042,524.2148
			407,873.2810	4,042,654.1211
			408,032.2500	4,042,647.6875
			408,089.5630	4,042,502.0625
			408,267.6560	4,042,491.4219
			408,347.0630	4,042,440.3203
			408,348.9690	4,041,492.4844
T36-4	0.03	SDCA	414,532.5630	4,039,759.7188
			414,583.3750	4,039,699.2617
			414,643.3130	4,039,605.6250
			414,700.5000	4,039,498.9766
			414,718.6880	4,039,441.7188
			414,729.1250	4,039,314.2500
			414,747.2500	4,039,108.7500
			414,550.5940	4,039,224.6563
			414,528.0310	4,039,697.5039
			414,532.5630	4,039,759.7188
T37-2	0.59	SDCA	408,694.5000	4,035,836.9883
			408,417.2190	4,035,957.7344
			408,370.5940	4,036,191.9453
			408,249.5940	4,036,258.3164
			408,231.6880	4,036,571.0625
			408,075.5000	4,036,791.1719
			408,254.4060	4,037,157.2813
			408,249.9060	4,037,387.3789
			408,606.5630	4,037,448.5391
			408,414.0000	4,037,664.3359
			408,348.8750	4,037,888.7227
			408,415.9060	4,038,042.2422
			408,494.0000	4,038,156.0977
			408,687.9380	4,038,284.6484
			408,762.7190	4,038,303.7813
			408,853.0940	4,038,290.2422
			408,911.3130	4,038,246.2109
			409,028.9380	4,038,251.5742
			409,126.1560	4,038,258.7344
			409,134.0630	4,038,309.6602
			409,144.5940	4,038,382.5547
			409,201.0630	4,038,424.0508
			409,255.5940	4,038,422.9180
			409,299.1250	4,038,391.3789
			409,304.7190	4,038,329.9609
			409,254.9380	4,038,259.1797
			409,308.0940	4,038,163.0195
			409,312.7190	4,038,061.7695
			409,335.7190	4,038,017.0195
			409,334.3750	4,037,792.3008
			409,260.5630	4,037,628.4492
			409,184.9060	4,037,508.1055
			409,044.0630	4,037,256.8359
			408,869.9060	4,037,236.6055
			408,755.8130	4,037,260.8867
			408,768.2810	4,037,143.0156
			408,784.9690	4,037,079.6914
			408,789.7190	4,036,817.3555
			408,751.4060	4,036,667.7344
			408,706.5940	4,036,616.2422
			408,694.5000	4,035,836.9883

Area ID	Area (miles)	Area type	Coordinates(UTM Zone11 meters NAD83)	
			X-coordinates	Y-coordinates
T25 & T23	0.57	SDCA	418754.0310	4033026.4648
			418552.9690	4033287.6914
			418484.0000	4033621.1133
			418689.0940	4034066.4102
			418529.0310	4034424.5078
			418434.8130	4034452.0664
			418325.1880	4034653.5234
			418224.7810	4034845.3438
			418067.7500	4035047.7852
			417953.1880	4035467.4961
			417980.5000	4035865.3203
			418027.9060	4036319.6094
			417924.7190	4037107.5195
			418665.4380	4034527.8516
			419064.9060	4034610.8672
			419222.8750	4034343.4492
			419141.3750	4034271.8047
			419084.1880	4033110.8242
			418754.0310	4033026.4648
T18b	0.03	SDCA	419802.4690	4033687.7656
			420012.7190	4033690.4844
			420006.8750	4034140.9297
			419832.0310	4034141.9609
			419802.4690	4033687.7656
T21a	0.43	SDCA	421766.0310	4032526.5938
			421758.4690	4032529.3477
			421806.2810	4032593.7305
			421884.3440	4032697.7148
			421918.7190	4032746.2988
			421948.4060	4032795.7422
			421977.7500	4032858.2227
			421994.8130	4032902.9766
			422010.1880	4032960.1484
			422019.3130	4033018.7031
			422022.5630	4033079.4023
			422021.5000	4033108.1875
			422103.3750	4033191.3320
			422274.9380	4033248.8359
			422331.4380	4033437.2383
			422451.9060	4033492.2617
			422530.2190	4033470.0195
			422579.0940	4033430.6797
			422659.7190	4033313.9453
			422698.6880	4033173.2383
			422688.0630	4032830.0469
			422701.7500	4032367.5195
			422592.2190	4031994.7988
			422299.6560	4031762.5020
			422105.2500	4031749.0176
			421854.9690	4031871.4102
			421952.1880	4032442.4199
			421827.1560	4032498.3555
			421778.4380	4032522.0762
			421766.0310	4032526.5938
T21b	0.06	SDCA	422021.5000	4033108.1875
			421959.5000	4033044.5586
			421680.6250	4033146.5156
			421615.5310	4032859.4297
			421668.6250	4032569.9238
			421758.4690	4032529.3477
			421806.2810	4032593.7305
			421884.3440	4032697.7148
			421918.7190	4032746.2988
			421948.4060	4032795.7422
			421977.7500	4032858.2227
			421994.8130	4032902.9766
			422010.1880	4032960.1484
			422019.3130	4033018.7031
			422022.5630	4033079.4023
			422021.5000	4033108.1875

Exhibit 1 - Map and coordinates of PM_{10} control areas

Area ID	Area (miles)	Area type	Coordinates(UTM Zone11 meters NAD83) X-coordinates	Y-coordinates
T18c	0.53	SDCA	420,276.9060	4,030,498.4297
			419,947.7810	4,030,741.5820
			420,067.1880	4,030,907.8086
			420,051.5940	4,031,073.7539
			420,132.5000	4,031,300.5000
			420,460.9690	4,031,604.8574
			420,448.8130	4,032,104.4238
			420,133.6880	4,032,354.6504
			419,976.0000	4,032,480.4629
			420,091.3440	4,032,635.9063
			420,399.6560	4,032,679.1270
			420,847.1880	4,032,406.2988
			421,369.5310	4,031,989.5391
			421,208.0630	4,031,771.3574
			421,204.5310	4,031,775.5723
			420,996.0630	4,031,494.8789
			420,276.9060	4,030,498.4297
T17	1.77	SDCA	419,965.0000	4,027,728.2129
			419,803.2190	4,027,847.7363
			419,922.8440	4,028,009.4902
			419,437.4690	4,028,368.0195
			419,317.9690	4,028,206.2617
			418,994.5310	4,028,445.2656
			418,723.3130	4,028,395.6211
			418,709.8750	4,028,405.5527
			418,741.5630	4,028,448.9863
			419,397.6250	4,029,329.5273
			419,791.5940	4,029,850.3008
			419,798.7500	4,029,851.3320
			420,276.9060	4,030,498.4297
			420,996.0630	4,031,494.8789
			421,204.5310	4,031,775.5723
			421,439.0940	4,031,498.2363
			421,631.0310	4,031,208.7773
			421,571.8750	4,030,077.3184
			421,548.9690	4,029,833.7383
			421,523.2500	4,029,607.1328
			421,241.1880	4,029,607.8887
			421,116.0000	4,029,457.7559
			420,776.0000	4,029,075.9551
			420,233.7500	4,028,421.8027
			420,070.9690	4,028,193.2832
			419,973.2500	4,027,978.3457
			419,965.0000	4,027,728.2129
T16 & T10	2.00	SDCA	416,930.1250	4,025,968.3438
			415,789.8440	4,026,810.3555
			416,016.5310	4,027,163.7949
			415,829.9690	4,027,301.7383
			415,812.0000	4,027,654.7695
			415,987.3440	4,028,348.7813
			415,969.6880	4,028,562.7461
			415,530.3750	4,028,446.4922
			415,660.2500	4,028,955.4551
			416,062.8130	4,029,458.0664
			416,386.1560	4,029,683.9746
			416,436.9060	4,029,720.7148
			416,449.5000	4,029,732.7207
			416,468.5940	4,029,742.7246
			416,489.8750	4,029,746.4355
			416,529.4060	4,029,741.9941
			416,547.9690	4,029,741.4180
			416,541.4060	4,029,755.8789
			416,528.0940	4,029,767.9277
			416,515.2190	4,029,777.7969
			416,501.9690	4,029,786.2637
			416,489.6560	4,029,794.9004
			416,430.1250	4,029,834.6543
			416,415.3750	4,029,843.4570
			416,400.7190	4,029,849.4766
			416,387.3130	4,029,856.1563
			416,372.5940	4,029,860.3105
			416,368.5310	4,029,870.0703
			416,375.7810	4,029,880.6270
			416,384.4690	4,029,895.7617
			416,385.5310	4,029,910.9023
			416,395.3130	4,029,918.6621
			416,406.0630	4,029,922.9727
			416,419.9060	4,029,929.8086
			416,435.1560	4,029,936.6543

Area ID	Area (miles)	Area type	Coordinates(UTM Zone11 meters NAD83) X-coordinates	Y-coordinates
T16 & T10 continued	2.00	SDCA	416449.2500	4029947.3340
			416459.1250	4029961.2246
			416462.9690	4029976.8418
			416471.5630	4029988.3965
			416481.0000	4029994.3359
			416483.2500	4030000.4590
			416476.4690	4030004.0684
			416464.6250	4030013.5332
			416452.1250	4030020.7266
			416447.3130	4030031.0762
			416454.8750	4030042.8809
			416467.7500	4030052.9766
			416466.0630	4030067.6035
			416454.5310	4030077.5586
			416440.6250	4030076.0938
			416437.6250	4030084.6914
			416445.8130	4030098.3496
			416459.0310	4030110.6875
			416465.9060	4030126.0488
			416467.1560	4030142.7871
			416461.5310	4030157.1523
			416450.1560	4030168.0938
			416439.0940	4030177.2402
			416443.8750	4030188.7227
			416458.4380	4030192.3809
			416470.3130	4030190.8789
			416479.0310	4030177.9727
			416493.8130	4030171.2637
			416510.6250	4030166.2656
			416527.2190	4030165.8828
			416541.7810	4030161.9238
			416568.0630	4030143.3945
			416585.0000	4030137.3281
			416601.6250	4030130.7734
			416608.7190	4030112.7188
			416614.8750	4030093.7324
			416614.1560	4030081.1367
			416606.9690	4030057.0176
			416610.2810	4030041.6328
			416621.0310	4030029.7910
			416626.8440	4030016.4492
			416634.6560	4030003.4863
			416639.6560	4029988.0273
			416642.2500	4029973.2676
			416656.7190	4029972.4727
			416688.3750	4029977.5293
			416704.9380	4029976.5762
			416715.9690	4029964.5742
			416723.1250	4029949.7949
			416734.4690	4029937.7109
			416747.7190	4029929.2070
			416759.0310	4029916.4004
			416768.4690	4029902.2207
			416781.8130	4029898.3633
			416790.3750	4029900.3945
			416827.0940	4029907.2129
			416838.2500	4029915.7813
			416845.7500	4029917.9492
			416852.5940	4029916.0938
			416867.9690	4029916.1543
			416880.3440	4029917.7637
			416895.6880	4029914.7402
			416925.9380	4029904.3965
			416940.7190	4029903.4805
			416954.8130	4029907.8730
			416966.3750	4029914.2246
			417119.3130	4029946.7070
			417187.6250	4029971.9180
			417581.8750	4030267.7148
			417521.0310	4029772.5156
			417653.4060	4029674.6738
			417852.7810	4029647.5566
			418383.2810	4029647.0859
			419085.9690	4029748.5098
			419093.6560	4029564.0527
			417877.2810	4029195.6055
			418000.2190	4028968.8594
			417985.4380	4028529.5684
			417827.8440	4028557.0566
			417546.5630	4028514.7832
			417094.6880	4027903.0527

Exhibit 1 - Map and coordinates of PM_{10} control areas

Area ID	Area (miles)	Area type	Coordinates(UTM Zone11 meters NAD83) X-coordinates	Y-coordinates
T16 & T10 continued	2.00	SDCA	416,457.7500	4,027,936.9766
			416,404.6880	4,027,788.4297
			416,365.0310	4,027,655.1465
			416,321.9690	4,027,364.6660
			416,373.0940	4,027,155.4727
			416,439.1560	4,026,996.8691
			416,529.0000	4,026,870.1172
			416,679.5310	4,026,765.2285
			416,794.3130	4,026,730.5000
			416,918.4690	4,026,690.9277
			417,059.9690	4,026,600.0957
			417,118.0940	4,026,580.9805
			417,289.0630	4,026,454.5645
			416,930.1250	4,025,968.3438
T12-1	0.33	SDCA	417,094.6880	4,027,903.0527
			416,457.7500	4,027,936.9766
			416,404.6880	4,027,788.4297
			416,365.0310	4,027,655.1465
			416,321.9690	4,027,364.6660
			416,373.0940	4,027,155.4727
			416,439.1560	4,026,996.8691
			416,529.0000	4,026,870.1172
			416,679.5310	4,026,765.2285
			416,794.3130	4,026,730.5000
			416,918.4690	4,026,690.9277
			417,059.9690	4,026,600.0957
			417,118.0940	4,026,580.9805
			417,075.7810	4,026,862.2246
			417,153.0940	4,027,305.2637
			417,068.6250	4,027,867.7852
			417,094.6880	4,027,903.0527
T13B	0.02	SDCA	419,887.6880	4,027,285.1777
			419,726.0630	4,027,404.7207
			419,965.0000	4,027,728.2129
			419,949.5310	4,027,659.1582
			419,887.6880	4,027,285.1777
T13c	0.02	SDCA	419,810.5000	4,026,842.1797
			419,648.7500	4,026,961.7246
			419,887.6880	4,027,285.1777
			419,878.5000	4,027,228.6270
			419,810.5000	4,026,842.1797
T10	1.51	SDCA	414,755.7190	4,025,075.7422
			414,875.1560	4,025,237.4785
			414,713.3750	4,025,356.9609
			414,832.8130	4,025,518.7363
			414,509.4060	4,025,757.7637
			414,628.8750	4,025,919.4863
			414,432.8750	4,026,064.3691
			414,474.4380	4,026,371.4551
			414,574.5630	4,026,473.5742
			414,628.3130	4,026,552.7695
			414,946.8130	4,027,212.2402
			415,303.7810	4,027,171.2852
			415,463.6880	4,026,710.9355
			415,641.0630	4,026,578.4043
			415,789.8440	4,026,810.3555
			416,930.1250	4,025,968.3438
			416,221.4060	4,025,003.5195
			415,803.2190	4,024,437.5703
			415,788.3750	4,024,419.2480
			415,755.0630	4,024,385.7285
			415,740.0630	4,024,367.4102
			415,730.9380	4,024,355.1348
			414,755.7190	4,025,075.7422
T13d	0.08	SDCA	418,812.1880	4,025,829.3945
			419,051.1560	4,026,152.9102
			419,212.9380	4,026,033.3887
			419,810.5000	4,026,842.1797
			419,654.8130	4,026,404.0859
			419,499.9380	4,025,999.3496
			419,182.9690	4,025,925.2813
			418,812.1880	4,025,829.3945

Area ID	Area (miles)	Area type	Coordinates(UTM Zone11 meters NAD83) X-coordinates	Y-coordinates
T2-6	0.97	SDCA	411915.1560	4023883.7793
			411828.0940	4024594.2207
			411988.0310	4025141.2695
			412161.8440	4025254.5859
			412387.4060	4025234.3184
			412577.3130	4025175.8184
			412752.9380	4025413.6777
			412942.5940	4025667.2090
			413298.0630	4025913.1816
			413700.7190	4025878.1113
			413843.4060	4025859.0313
			413892.3750	4025869.0625
			414103.4380	4026021.7207
			414294.0310	4026188.3672
			414474.4380	4026371.4551
			414432.8750	4026064.3691
			414383.9380	4025998.1035
			414275.7810	4025684.7422
			414249.7810	4025496.0488
			414265.6560	4025321.0762
			414210.4380	4025245.9102
			413520.9060	4024987.7734
			413307.2500	4025145.6113
			412118.5000	4023536.9766
			411983.4060	4023714.6152
			411915.1560	4023883.7793
T9 & T10	0.70	SDCA	416221.4060	4025003.5195
			416930.1250	4025968.3438
			417169.6250	4026292.8027
			417483.0630	4026061.2207
			417363.6560	4025899.4727
			417848.8440	4025540.9238
			418087.8130	4025864.4414
			418249.6250	4025744.9199
			417981.1560	4025483.1621
			417862.3130	4025432.8262
			417742.6560	4025357.7832
			417731.0940	4025299.8848
			417711.4060	4025042.9023
			417596.9060	4024857.0391
			417427.9690	4024735.2051
			417308.1560	4024673.9160
			417192.2500	4024288.4082
			417038.6560	4023907.3789
			416987.0630	4023427.0801
			416718.5940	4023625.4961
			416734.5000	4023647.0195
			416700.3130	4023672.3301
			416688.8130	4023734.0977
			416678.0000	4023742.0566
			416644.1880	4023924.8242
			417009.4380	4024643.3945
			416999.7190	4024998.1367
			416221.4060	4025003.5195
T13e	0.01	SDCA	418530.9060	4025787.1563
			418650.3750	4025948.9160
			418812.1880	4025829.3945
			418722.7810	4025817.3457
			418530.9060	4025787.1563
T13f	0.01	SDCA	418249.6250	4025744.9199
			418369.0940	4025906.6797
			418530.9060	4025787.1563
			418416.1250	4025770.9355
			418249.6250	4025744.9199
T1-4	0.81	SDCA	410989.3130	4022252.0020
			410984.9060	4022253.3125
			410759.9060	4022411.6719
			410472.0310	4023123.1973
			410718.0630	4023206.8965
			410862.1250	4023378.8164
			410821.5940	4023731.0039
			410665.3750	4023862.7910
			410401.5000	4024041.8867
			410411.4380	4024308.5215
			410520.6560	4024349.3066
			411162.2810	4024681.8047
			411124.9690	4024778.6250
			411222.3440	4024873.7930

Exhibit 1 - Map and coordinates of PM_{10} control areas

Area ID	Area (miles)	Area type	Coordinates(UTM Zone11 meters NAD83)	
			X-coordinates	Y-coordinates
T1-4 continued	0.81	SDCA	411,392.4060	4,024,792.1602
			411,607.8130	4,024,539.2461
			411,737.1560	4,023,825.0313
			411,867.2500	4,023,463.2520
			411,784.7500	4,023,306.3613
			411,582.4060	4,023,006.9551
			411,126.7810	4,022,795.5957
			410,994.2500	4,022,416.6367
			410,989.3130	4,022,252.0020
T1-3	1.09	SDCA	410,109.0000	4,021,484.2637
			410,014.9380	4,021,469.1094
			409,986.8440	4,021,465.6152
			409,959.4380	4,021,467.4043
			409,836.5940	4,021,452.1992
			409,710.2810	4,021,438.8574
			409,583.4380	4,021,449.5684
			409,464.4690	4,021,488.9551
			409,351.8750	4,021,549.4316
			409,255.5940	4,021,639.3984
			409,218.6880	4,021,681.9980
			409,176.1250	4,021,738.1621
			409,146.5630	4,021,804.0762
			409,136.6880	4,021,861.1289
			409,118.7810	4,021,931.0723
			409,108.8130	4,021,989.7910
			409,094.0000	4,022,070.1055
			409,085.6880	4,022,117.5977
			409,078.5310	4,022,146.7773
			409,061.1250	4,022,247.9473
			409,045.9690	4,022,310.3633
			409,033.1250	4,022,381.5703
			409,029.3750	4,022,398.8301
			409,009.4380	4,022,518.7207
			409,000.8440	4,022,749.8164
			408,748.8130	4,022,752.2285
			408,748.6880	4,022,994.9199
			408,752.0000	4,023,250.6855
			409,002.0630	4,023,249.9121
			408,999.6250	4,023,000.2637
			410,005.2500	4,022,997.9414
			410,001.3440	4,023,280.3730
			410,254.3750	4,023,245.9746
			410,472.0310	4,023,123.1973
			410,759.9060	4,022,411.6719
			410,984.9060	4,022,253.3125
			410,989.3130	4,022,252.0020
			411,145.5940	4,022,140.7344
			410,718.8440	4,021,593.2148
			410,712.3750	4,021,582.9375
			410,529.8750	4,021,556.1816
			410,438.7190	4,021,533.8438
			410,335.4060	4,021,518.5000
			410,242.0940	4,021,502.6836
			410,174.2810	4,021,494.7188
			410,109.0000	4,021,484.2637
T5a	0.21	SDCA	414,982.1560	4,021,997.8184
			415,526.5000	4,022,002.0215
			416,002.5310	4,022,602.1270
			415,998.3750	4,023,002.3203
			416,206.3130	4,023,003.7539
			416,056.9690	4,023,114.1348
			415,817.9380	4,022,790.5840
			415,581.1880	4,022,965.4980
			415,103.1880	4,022,318.4160
			415,178.0630	4,022,263.0664
			414,982.1560	4,021,997.8184
T1-2	0.39	SDCA	409,223.5310	4,020,182.5996
			409,280.3750	4,020,086.8984
			409,276.4690	4,020,023.0879
			409,360.9380	4,020,010.4766
			409,373.6560	4,020,006.3652
			409,409.3130	4,020,065.3262
			409,487.5940	4,020,143.3262
			409,998.0310	4,020,801.4766
			410,027.5940	4,021,036.2754
			410,109.0000	4,021,484.2637
			410,014.9380	4,021,469.1094
			409,986.8440	4,021,465.6152
			409,959.4380	4,021,467.4043
			409,836.5940	4,021,452.1992

Area ID	Area (miles)	Area type	Coordinates(UTM Zone11 meters NAD83)	
			X-coordinates	Y-coordinates
T1-2 continued	0.39	SDCA	409710.2810	4021438.8574
			409583.4380	4021449.5684
			409495.3440	4021478.5996
			409464.4690	4021488.9551
			409351.8750	4021549.4316
			409255.5940	4021639.3984
			409218.6880	4021681.9980
			409176.1250	4021738.1621
			409146.5630	4021804.0762
			409166.6250	4020986.3672
			409223.5310	4020182.5996
T5b	0.03	SDCA	414001.2500	4020257.5078
			414001.4690	4020502.4766
			414426.0000	4020500.8613
			414464.0310	4020432.0313
			414293.7190	4020338.7207
			414135.9690	4020279.6660
			414001.2500	4020257.5078
T2	0.29	SDCA	410025.1560	4019002.0527
			410016.8750	4020278.1387
			409576.6880	4020126.1250
			409445.4060	4019983.3887
			409435.7810	4019902.2852
			409208.0310	4019472.8008
			409200.4380	4019355.6914
			409374.7500	4019259.9512
			409428.5630	4019253.1973
			409493.8750	4019250.0898
			409534.9380	4019112.7676
			409535.8130	4018994.6445
			410025.1560	4019002.0527
S1	0.71	Study	410001.6560	4042464.2656
			409290.7190	4042500.2383
			408861.2190	4042688.4688
			408813.8750	4042910.9609
			408859.4380	4043071.8984
			408972.0940	4043285.6914
			409337.5310	4043461.0000
			410500.6560	4043924.3945
			410962.4690	4044000.3555
			411096.8440	4043852.2109
			411108.0630	4043672.6836
			410984.4380	4043481.0273
			410592.0940	4043294.9219
			410496.6250	4043013.0352
			410088.4380	4043009.1836
			410003.7500	4043010.8320
			410001.6560	4042464.2656
S2	0.28	Study	414928.6560	4041572.7617
			415075.1250	4041273.9336
			415237.3130	4041985.5195
			415639.7810	4042385.2695
			415283.2810	4043000.1953
			414740.2500	4042529.6992
			414928.6560	4041572.7617
S3	0.72	Study	421208.0630	4031771.3574
			421766.0310	4032526.5938
			421778.4380	4032522.0762
			421827.1560	4032498.3555
			421952.1880	4032442.4199
			421854.9690	4031871.4102
			422105.2500	4031749.0176
			422299.6560	4031762.5020
			422592.2190	4031994.7988
			422701.7500	4032367.5195
			422732.5630	4032243.8984
			422746.8130	4032159.0254
			422779.7500	4032064.7734
			422779.7190	4031946.8984
			422793.9060	4031814.8984
			422817.5310	4031682.9316
			422840.9690	4031565.0645
			422869.3130	4031447.2109
			422836.2810	4031338.7852
			422713.7500	4031206.8086
			422529.9380	4030985.2422
			422250.5940	4030779.7578
			422000.0310	4030499.9922

Exhibit 1 - Map and coordinates of PM_{10} control areas

Area ID	Area (miles)	Area type	Coordinates(UTM Zone11 meters NAD83) X-coordinates	Y-coordinates
S3 continued	0.72	Study	422,006.2810	4,030,500.0156
			421,836.9380	4,030,271.0234
			421,548.9690	4,029,833.7383
			421,571.8750	4,030,077.3184
			421,631.0310	4,031,208.7773
			421,439.0940	4,031,498.2363
			421,208.0630	4,031,771.3574
S4	0.15	Study	417,410.5630	4,023,845.5176
			417,398.8440	4,023,845.8750
			417,387.4380	4,023,846.9883
			417,377.4060	4,023,848.7207
			417,367.8440	4,023,851.0527
			417,358.9380	4,023,853.9434
			417,350.9380	4,023,857.4238
			417,343.0940	4,023,861.6250
			417,335.2810	4,023,866.7793
			417,327.4690	4,023,872.8066
			417,319.6880	4,023,879.7500
			417,310.5940	4,023,888.9688
			417,301.9690	4,023,899.1680
			417,293.6560	4,023,910.1230
			417,286.2810	4,023,921.5137
			417,281.1250	4,023,930.3848
			417,276.9060	4,023,939.6543
			417,273.1560	4,023,949.9414
			417,269.7190	4,023,961.3281
			417,266.5000	4,023,975.5664
			417,263.6560	4,023,992.3125
			417,257.5630	4,024,036.4043
			417,255.7810	4,024,053.0898
			417,254.3440	4,024,071.4844
			417,253.3440	4,024,112.0410
			417,253.6880	4,024,135.3887
			417,256.4690	4,024,211.2207
			417,258.9380	4,024,248.6602
			417,260.8130	4,024,266.7930
			417,266.0630	4,024,299.1426
			417,269.5630	4,024,313.8516
			417,274.6560	4,024,330.5859
			417,281.5940	4,024,349.5684
			417,289.7810	4,024,368.9414
			417,298.0630	4,024,386.4863
			417,306.2810	4,024,401.4785
			417,314.9690	4,024,415.0508
			417,324.0630	4,024,427.2441
			417,333.2500	4,024,437.8730
			417,341.8130	4,024,446.3809
			417,362.2810	4,024,463.6328
			417,374.6880	4,024,472.7871
			417,391.6880	4,024,484.4727
			417,422.5940	4,024,504.8984
			417,438.9380	4,024,515.1504
			417,454.8440	4,024,524.5742
			417,469.5000	4,024,532.6895
			417,483.8130	4,024,540.1250
			417,497.9690	4,024,546.9180
			417,525.0310	4,024,558.3184
			417,537.3130	4,024,562.7500
			417,550.9690	4,024,567.0371
			417,565.6880	4,024,571.1504
			417,595.7190	4,024,578.3379
			417,644.3750	4,024,588.4512
			417,671.1560	4,024,593.2676
			417,699.5630	4,024,597.4395
			417,729.9690	4,024,601.0371
			417,763.4060	4,024,604.2285
			417,801.4380	4,024,607.2109
			417,876.5000	4,024,612.3184
			417,885.9690	4,024,613.4160
			417,906.1880	4,024,617.6074
			417,954.9060	4,024,630.4629
			417,966.3750	4,024,632.8535
			417,976.4690	4,024,634.2813
			417,984.4060	4,024,634.8398
			417,991.7190	4,024,634.7266
			417,998.0940	4,024,633.9082
			418,004.0310	4,024,632.4531
			418,009.1560	4,024,630.2891
			418,013.8130	4,024,627.4102
			418,017.8750	4,024,623.8594
			418,021.4380	4,024,619.5566
			418,027.1560	4,024,609.7598

Area ID	Area (miles)	Area type	Coordinates(UTM Zone11 meters NAD83) X-coordinates	Y-coordinates
S4 continued	0.15	Study	418032.4060	4024597.6895
			418034.6560	4024589.4512
			418035.8750	4024580.7773
			418035.6560	4024570.7617
			418034.0630	4024559.9766
			418031.0630	4024548.3418
			418026.3750	4024535.4473
			418020.4690	4024521.3984
			418000.5310	4024478.6465
			417984.5630	4024435.9668
			417970.9060	4024402.7227
			417957.8130	4024373.8125
			417943.3130	4024343.8242
			417931.2500	4024320.3027
			417918.0940	4024295.7734
			417880.1250	4024228.6719
			417859.5000	4024190.0117
			417854.1250	4024181.0176
			417848.9380	4024173.2773
			417843.6250	4024166.4160
			417838.3130	4024160.3535
			417832.0940	4024154.4258
			417825.1250	4024149.1992
			417816.9690	4024144.4160
			417807.5630	4024140.0762
			417799.1250	4024136.8242
			417789.4690	4024133.5957
			417744.3750	4024120.6641
			417733.3130	4024116.6641
			417723.6250	4024112.4082
			417716.8440	4024108.7773
			417710.6880	4024104.8281
			417693.1880	4024092.0859
			417683.1250	4024084.1797
			417674.4380	4024076.5137
			417667.2810	4024069.1191
			417661.4690	4024061.8086
			417657.0630	4024054.5488
			417654.5000	4024048.2773
			417652.5000	4024040.8516
			417647.9060	4024009.5918
			417646.3750	4024002.8047
			417644.5940	4023996.9746
			417640.7500	4023988.9395
			417636.0310	4023980.8086
			417630.3750	4023972.9629
			417623.6560	4023965.2930
			417617.2810	4023958.7949
			417609.9690	4023952.3184
			417601.7810	4023945.7832
			417592.6250	4023939.0781
			417575.3440	4023927.6641
			417540.5940	4023906.3262
			417526.8440	4023897.4316
			417515.0940	4023889.3320
			417487.6880	4023868.7949
			417472.0940	4023858.9844
			417463.6560	4023854.8926
			417455.1880	4023851.9063
			417444.7810	4023849.1504
			417433.6250	4023847.1348
			417422.1560	4023845.9258
			417410.5630	4023845.5176
C1	0.21	Channel	410989.3130	4022252.0020
			410994.2500	4022416.6367
			411126.7810	4022795.5957
			411582.4060	4023006.9551
			411784.7500	4023306.3613
			411867.2500	4023463.2520
			411737.1560	4023825.0313
			411915.1560	4023883.7793
			411983.4060	4023714.6152
			412118.5000	4023536.9766
			411783.0000	4023082.8359
			411698.3750	4022867.5078
			411641.7810	4022726.1934
			411641.2190	4022434.6367
			411422.2810	4022348.0508
			411285.7500	4022320.5957
			411145.5940	4022140.7344
			410989.3130	4022252.0020

Exhibit 1 - Map and coordinates of PM_{10} control areas

Area ID	Area (miles)	Area type	Coordinates(UTM Zone11 meters NAD83) X-coordinates	Y-coordinates
C2	0.29	Channel	409,223.5310	4,020,182.5996
			409,280.3750	4,020,086.8984
			409,276.4690	4,020,023.0879
			409,360.9380	4,020,010.4766
			409,373.6560	4,020,006.3652
			409,409.3130	4,020,065.3262
			409,487.5940	4,020,143.3262
			409,998.0310	4,020,801.4766
			410,027.5940	4,021,036.2754
			410,109.0000	4,021,484.2637
			410,174.2810	4,021,494.7188
			410,242.0940	4,021,502.6836
			410,335.4060	4,021,518.5000
			410,438.7190	4,021,533.8438
			410,529.8750	4,021,556.1816
			410,712.3750	4,021,582.9375
			410,604.9060	4,021,412.4785
			410,687.5940	4,021,327.9746
			410,488.7190	4,020,946.6582
			410,264.9380	4,020,620.1895
			410,015.6880	4,020,454.4141
			410,016.8750	4,020,278.1387
			409,576.6880	4,020,126.1250
			409,445.4060	4,019,983.3887
			409,435.7810	4,019,902.2852
			409,208.0310	4,019,472.8008
			409,201.5000	4,019,370.5664
			409,173.3130	4,019,532.8418
			409,115.7190	4,019,657.4395
			409,058.5940	4,019,813.5703
			409,055.4380	4,019,859.0117
			409,098.6560	4,019,944.7520
			409,192.5940	4,020,079.2344
			409,223.5310	4,020,182.5996
Corridor 1	0.14	DCM	411,404.0940	4,041,881.5078
			411,328.8130	4,041,911.0039
			411,307.5940	4,041,894.7266
			411,206.9380	4,042,044.9063
			411,252.4060	4,044,581.8867
			411,297.8130	4,044,632.7539
			411,393.9060	4,044,623.3633
			411,326.8130	4,042,108.9727
			411,411.9380	4,041,944.4414
			411,404.0940	4,041,881.5078
T35	0.26	DCM	410,001.6560	4,042,464.2656
			410,000.0000	4,042,003.4180
			410,754.6560	4,042,002.5391
			410,757.3750	4,042,448.5820
			410,577.9380	4,042,452.2773
			410,599.0630	4,042,999.1289
			410,003.7500	4,043,010.8320
			410,001.6560	4,042,464.2656
T23 thru 30	13.19	DCM	419,832.0310	4,034,141.9609
			419,222.8750	4,034,343.4492
			419,064.9060	4,034,610.8672
			418,665.4380	4,034,527.8516
			417,924.7190	4,037,107.5195
			417,056.8130	4,037,995.5234
			416,908.7190	4,037,982.5234
			416,631.9690	4,038,195.4219
			416,422.7190	4,038,451.3359
			415,865.4690	4,039,054.8633
			415,536.0310	4,039,224.5117
			415,102.2190	4,039,351.9453
			414,905.7190	4,039,737.5508
			414,931.1560	4,040,036.5156
			414,894.9380	4,040,266.0117
			414,848.0630	4,040,378.9961
			414,797.1880	4,040,944.3359
			414,873.6560	4,041,023.6289
			414,828.3130	4,041,092.9570
			414,928.6560	4,041,572.7617
			415,075.1250	4,041,273.9336
			415,237.3130	4,041,985.5195
			415,645.7500	4,042,391.2070
			415,872.2190	4,042,360.3477
			416,000.9380	4,042,344.1055
			416,005.6250	4,042,568.5234
			416,413.8750	4,042,560.2578
			416,415.9060	4,043,001.9297

Area ID	Area (miles)	Area type	Coordinates(UTM Zone11 meters NAD83) X-coordinates	Y-coordinates
T23 thru 30 continued	13.19	DCM	417385.2500	4042993.4570
			417370.0940	4042770.4766
			417719.9060	4042619.4531
			417792.5000	4042117.6719
			418026.3130	4042090.2539
			418032.4690	4042385.2734
			418154.9060	4042206.3711
			418410.5000	4042382.5898
			418608.9380	4042170.9414
			418642.5940	4042098.0430
			418743.9060	4042022.1406
			418637.1560	4041594.2695
			418839.1560	4040396.7852
			418687.1250	4040203.3438
			418733.7190	4040126.7656
			419760.8750	4039175.2695
			420448.8750	4038850.6133
			421672.5630	4037910.9570
			421774.5940	4037694.9570
			421823.2190	4037710.5156
			422114.0310	4037354.1172
			422453.6250	4036821.3398
			422236.8440	4036716.3086
			422544.5630	4036065.0313
			422559.9380	4034701.7969
			422429.2810	4034127.0234
			419832.0310	4034141.9609
T36	2.41	DCM	414532.5630	4039759.7188
			414544.1880	4039918.4961
			414347.2810	4040341.8281
			414341.6250	4040340.8398
			414296.4060	4040328.5234
			414287.8440	4040319.8633
			414268.3750	4040314.5508
			414211.2190	4040321.9883
			414047.5000	4040298.1172
			414003.0000	4040378.3242
			414010.8750	4040412.9063
			414039.0940	4040436.0195
			413723.0940	4040965.9141
			413561.2500	4041141.6016
			413478.6880	4041158.2148
			413443.2190	4041269.5156
			413241.1250	4041488.5234
			413191.5310	4041500.2969
			412841.4380	4041505.7500
			412833.7190	4041412.9141
			412690.1560	4041406.0313
			412652.2190	4041436.0781
			412682.0630	4041508.1523
			412344.1560	4041513.1602
			411328.8130	4041911.0039
			410132.5940	4040993.3945
			410766.2190	4040418.8281
			413592.7810	4039353.6953
			414146.5000	4039386.4141
			414550.5940	4039224.6563
			414528.0310	4039697.5039
			414532.5630	4039759.7188
T18a	2.67	DCM	417581.8750	4030267.7148
			417605.5940	4030460.9473
			417838.7500	4030929.0918
			418459.9380	4031788.9746
			418889.0940	4032024.0352
			418754.0310	4033026.4648
			419239.5310	4033150.5156
			419467.0940	4034262.6992
			419832.0310	4034141.9609
			419771.8750	4033218.0078
			419606.1560	4032994.4258
			420091.3440	4032635.9063
			419976.0000	4032480.4629
			420133.6880	4032354.6504
			420448.8130	4032104.4238
			420460.9690	4031604.8574
			420132.5000	4031300.5000
			420051.5940	4031073.7539
			420067.1880	4030907.8086
			419947.7810	4030741.5820
			420276.9060	4030498.4297
			419798.7500	4029851.3320

Exhibit 1 - Map and coordinates of PM_{10} control areas

Area ID	Area (miles)	Area type	Coordinates(UTM Zone11 meters NAD83) X-coordinates	Y-coordinates
T18a continued	2.67	DCM	418,383.2810	4,029,647.0859
			417,852.7810	4,029,647.5566
			417,653.4060	4,029,674.6738
			417,521.0310	4,029,772.5156
			417,581.8750	4,030,267.7148
T11	0.67	DCM	415,789.8440	4,026,810.3555
			415,641.0630	4,026,578.4043
			415,463.6880	4,026,710.9355
			415,303.7810	4,027,171.2852
			414,829.7500	4,027,225.6699
			414,603.4060	4,027,348.4004
			414,525.4380	4,027,872.6914
			414,845.5630	4,028,265.1602
			415,969.6880	4,028,562.7461
			415,987.3440	4,028,348.7813
			415,812.0000	4,027,654.7695
			415,829.9690	4,027,301.7383
			416,016.5310	4,027,163.7949
			415,789.8440	4,026,810.3555
T13a	2.47	DCM	417,169.6250	4,026,292.8027
			417,289.0630	4,026,454.5645
			417,118.0940	4,026,580.9805
			417,075.7810	4,026,862.2246
			417,153.0940	4,027,305.2637
			417,068.6250	4,027,867.7852
			417,546.5630	4,028,514.7832
			417,827.8440	4,028,557.0566
			418,270.9380	4,028,479.7695
			418,552.2190	4,028,522.0059
			418,723.3130	4,028,395.6211
			418,994.5310	4,028,445.2656
			419,317.9690	4,028,206.2617
			419,437.4690	4,028,368.0195
			419,922.8440	4,028,009.4902
			419,803.2190	4,027,847.7363
			419,965.0000	4,027,728.2129
			419,726.0630	4,027,404.7207
			419,887.6880	4,027,285.1777
			419,648.7500	4,026,961.7246
			419,810.5000	4,026,842.1797
			419,212.9380	4,026,033.3887
			419,051.1560	4,026,152.9102
			418,812.1880	4,025,829.3945
			418,650.3750	4,025,948.9160
			418,530.9060	4,025,787.1563
			418,369.0940	4,025,906.6797
			418,249.6250	4,025,744.9199
			418,087.8130	4,025,864.4414
			417,848.8440	4,025,540.9238
			417,363.6560	4,025,899.4727
			417,483.0630	4,026,061.2207
			417,169.6250	4,026,292.8027
T8	0.21	DCM	413,520.9060	4,024,987.7734
			413,954.0000	4,024,667.7598
			414,432.0940	4,025,314.7227
			414,755.7190	4,025,075.7422
			414,875.1560	4,025,237.4785
			414,713.3750	4,025,356.9609
			414,832.8130	4,025,518.7363
			414,509.4060	4,025,757.7637
			414,628.8750	4,025,919.4863
			414,432.8750	4,026,064.3691
			414,383.9380	4,025,998.1035
			414,275.7810	4,025,684.7422
			414,249.7810	4,025,496.0488
			414,265.6560	4,025,321.0762
			414,210.4380	4,025,245.9102
			413,520.9060	4,024,987.7734
T5 thru T8	3.53	DCM	414,505.9690	4,021,353.3281
			414,222.0630	4,020,969.0215
			413,736.8130	4,021,327.4629
			413,975.7810	4,021,651.0234
			413,814.0000	4,021,770.5449
			414,053.0940	4,022,094.1016
			413,406.0630	4,022,572.1836
			413,166.9380	4,022,248.5879
			412,196.4380	4,022,965.6328
			412,435.5630	4,023,289.1914
			412,112.0000	4,023,528.1816

Area ID	Area (miles)	Area type	Coordinates(UTM Zone11 meters NAD83) X-coordinates	Y-coordinates
T5 thru T8 continued	3.53	DCM	413307.2500	4025145.6113
			413954.0000	4024667.7598
			414432.0940	4025314.7227
			416696.5940	4023641.5605
			416218.7190	4022994.5840
			415895.2810	4023233.6211
			415656.1880	4022910.1016
			415332.7190	4023149.1055
			414376.5630	4021855.0645
			414700.1560	4021616.0996
			414505.9690	4021353.3281
T9	0.46	DCM	416218.7190	4022994.5840
			416696.5940	4023641.5605
			415730.9380	4024355.1348
			415740.0630	4024367.4102
			415755.0630	4024385.7285
			415788.3750	4024419.2480
			415803.2190	4024437.5703
			416221.4060	4025003.5195
			416999.7190	4024998.1367
			417009.4380	4024643.3945
			416644.1880	4023924.8242
			416678.0000	4023742.0566
			416688.8130	4023734.0977
			416700.3130	4023672.3301
			416734.5000	4023647.0195
			416718.5940	4023625.4961
			416987.0630	4023427.0801
			416933.0310	4023305.0703
			416218.7190	4022994.5840
T1-1	0.24	DCM	410001.3440	4023280.3730
			410005.2500	4022997.9414
			408999.6250	4023000.2637
			409007.7810	4023833.0859
			409051.0310	4023839.1992
			409110.8440	4023908.2500
			409125.3750	4023977.1719
			409135.9380	4023986.4395
			409555.1250	4023595.2637
			409806.6880	4023351.0098
			410001.3440	4023280.3730
T2 thru 5	3.62	DCM	410025.1560	4019002.0527
			410015.6880	4020454.4141
			410264.9380	4020620.1895
			410488.7190	4020946.6582
			410687.5940	4021327.9746
			410604.9060	4021412.4785
			410718.8440	4021593.2148
			411285.7500	4022320.5957
			411422.2810	4022348.0508
			411641.2190	4022434.6367
			411641.7810	4022726.1934
			411698.3750	4022867.5078
			411783.0000	4023082.8359
			412112.0000	4023528.1816
			412435.5630	4023289.1914
			412196.4380	4022965.6328
			413088.5940	4022306.4473
			413166.9380	4022248.5879
			413406.0630	4022572.1836
			414053.0940	4022094.1016
			413814.0000	4021770.5449
			413975.7810	4021651.0234
			413736.8130	4021327.4629
			414222.0630	4020969.0215
			414505.9690	4021353.3281
			414557.3750	4020853.0215
			414717.5310	4020809.5039
			414704.8750	4020499.7988
			414001.4690	4020502.4766
			414001.2500	4020257.5078
			413767.6560	4020273.3301
			413695.4380	4020332.7383
			413677.0630	4020225.3008
			413700.3440	4020128.3535
			413549.0940	4020190.3926
			413444.4060	4020190.3945
			413394.0000	4020105.0723
			413343.6560	4020101.2031
			413266.1250	4020221.4121

Exhibit 1 - Map and coordinates of PM_{10} control areas

Area ID	Area (miles)	Area type	X-coordinates	Y-coordinates
			Coordinates(UTM Zone11 meters NAD83)	
T2 thru 5 continued	3.62	DCM	413090.0310	4020217.8281
			413082.4060	4020077.9375
			412973.9060	4020085.6738
			412756.6880	4020031.3984
			412389.2810	4020442.0293
			412270.9690	4020910.1992
			411937.4060	4020860.1270
			411952.8130	4020757.8945
			411835.6880	4020364.6348
			411,644.0940	4,020,105.5039
			411,579.3750	4,020,095.7637
			411,149.7500	4,019,542.1543
			410,360.7190	4,019,008.5000
			410,025.1560	4,019,002.0527
T5-2	0.03	DCM	415,656.1880	4,022,910.1016
			415,817.9380	4,022,790.5840
			416,056.9690	4,023,114.1348
			415,895.2810	4,023,233.6211
			415,656.1880	4,022,910.1016
T5-3	0.22	DCM	414,700.1560	4,021,616.0996
			414,376.5630	4,021,855.0645
			415,332.7190	4,023,149.1055
			415,581.1880	4,022,965.4980
			415,103.1880	4,022,318.4160
			415,178.0630	4,022,263.0664
			414,700.1560	4,021,616.0996

Area ID	Area (miles)	Area type	X-coordinates	Y-coordinates
			Coordinates(UTM Zone11 meters NAD83)	

Total SDCA	12.86
Total Study	1.86
Total Channel	0.50
Total DCM	30.12

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Exhibit 2 - TDCA Minimum Dust Control Efficiency map

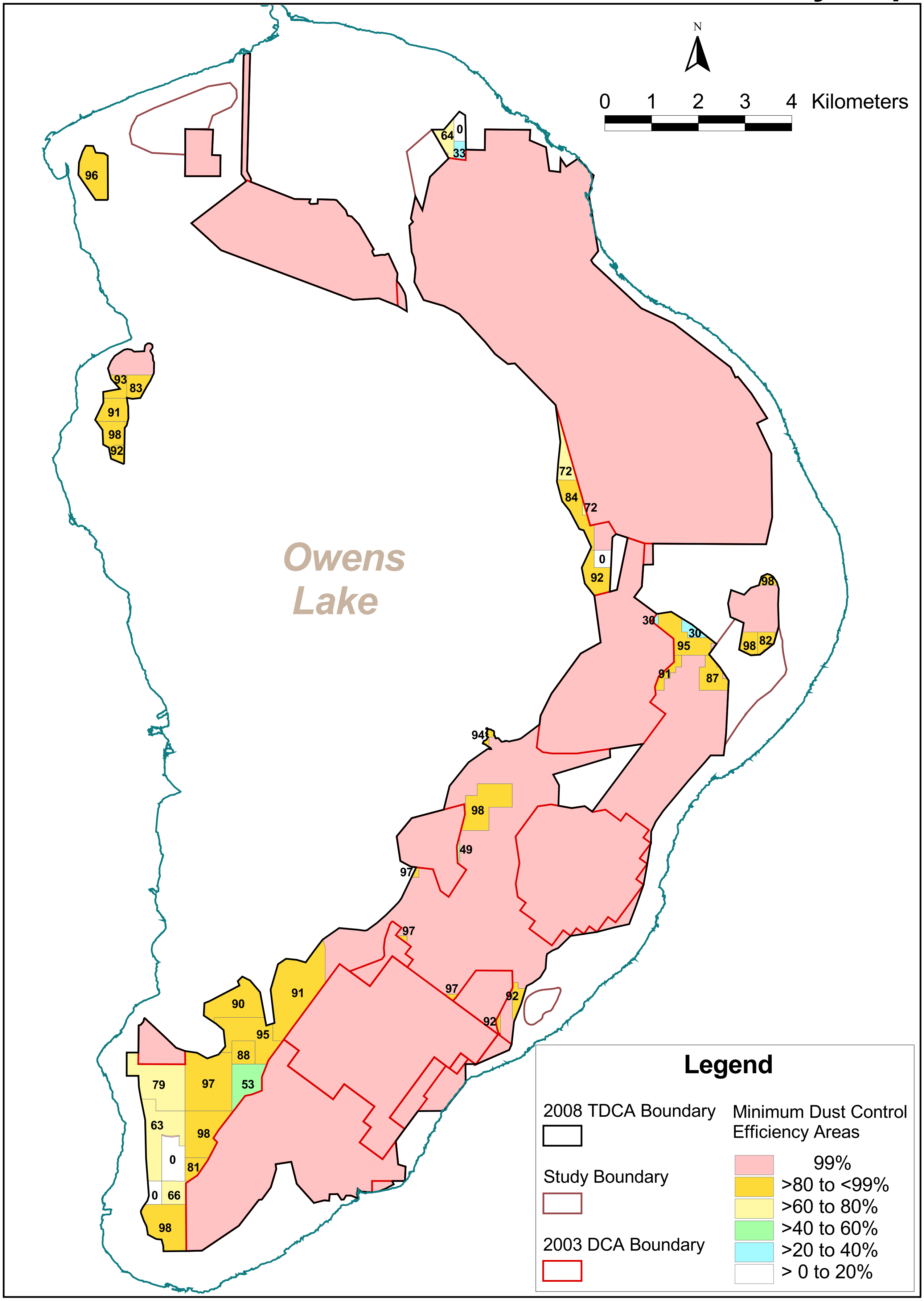

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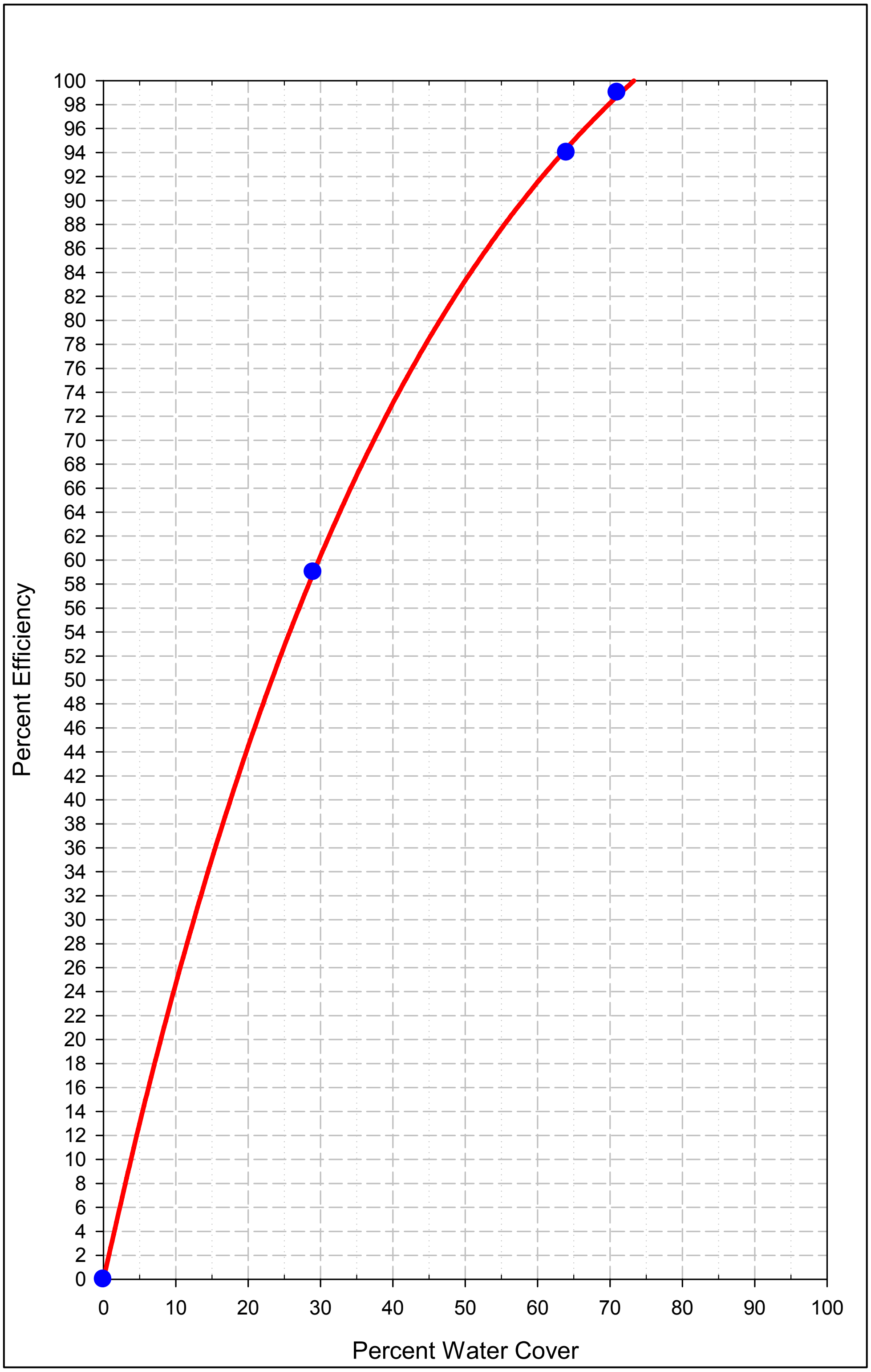
Exhibit 3 - Shallow Flood control efficiency curve



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SETTLEMENT AGREEMENT

This Settlement Agreement (Agreement) is entered into between the Great Basin Unified Air Pollution Control District (District) and the City of Los Angeles by and through its Department of Water and Power (collectively "City") (the City and District to be referred to as the "Parties") to resolve the City's challenge to the District's Supplemental Control Requirement (SCR) determination for the Owens Lake bed issued on December 21, 2005, and modified on April 4, 2006.

RECITALS

WHEREAS:

A. Owens Lake is located in Inyo County in eastern California, south of the town of Lone Pine and north of the town of Olancha.

B. Large portions of the Owens Lake bed are comprised primarily of dry saline soils and crusts.

C. The lake bed soils and crusts are a source of wind-borne dust during significant wind events, and contribute to elevated concentrations of particulate matter less than 10 microns in diameter (PM_{10}).

D. PM_{10} is a criteria pollutant regulated by the federal Clean Air Act, 42 U.S.C. Section 7401 *et seq*., as amended (CAA).

E. Under the National Ambient Air Quality Standard (NAAQS) adopted pursuant to the CAA, PM_{10} levels may not exceed an average concentration of 150 micrograms per cubic meter ($\mu g/m^3$) during a 24-hour period more than one time per calendar year averaged over three years.

F. The District has regulatory authority over air quality issues in the region where Owens Lake is situated.

G. Under Health and Safety Code Section 42316, enacted by the California Legislature in 1983, the District has authority to require the City to undertake reasonable measures at Owens Lake in order to address the impacts of its activities that cause or contribute to violations of federal and state air quality standards, including but not limited to the NAAQS for PM_{10}.

H. In 1987, the United States Environmental Protection Agency (EPA) identified the Owens Valley Planning Area (OVPA), which encompasses

Owens Lake, as an area not meeting the NAAQS for PM_{10}. In 1993, the OVPA was reclassified as a serious non-attainment area under the CAA.

I. In 1997, the District adopted the Owens Valley PM_{10} Demonstration of Attainment State Implementation Plan as required by the CAA (1997 SIP). In 1998, the District and the City agreed that the City would construct control measures on 16.5 square miles of the Owens Lake bed by the end of 2003 as part of a SIP revision in 1998.

J. In 2003, through District Board Order 03111-01 (Order), the District required the City to construct dust control measures (DCMs) on an additional 13.3 square miles of the Owens Lake bed by the end of 2006, for a total of 29.8 square miles of dust control measures, as part of a Revised SIP (2003 SIP). The Order and 2003 SIP also established a process whereby the Air Pollution Control Officer of the District (APCO) must evaluate on at least an annual basis the potential need for additional DCMs and "watch areas" at Owens Lake bed in order to attain the NAAQS. The process involves a determination by the APCO and an opportunity for the City to present an alternative analysis.

K. On December 21, 2005, the APCO issued the 2004/2005 SCR determination finding that the City would be required to implement DCMs on an additional 9.31 square miles of Owens Lake bed and identifying 0.66 square miles as "watch area."

L. On January 20, 2006, the City appealed the 2004/2005 SCR determination to the California Air Resources Board (CARB). The District disagreed that the determination was subject to such an appeal.

M. On February 22, 2006, the City submitted an Alternative Analysis contesting aspects of the 2004/2005 SCR determination.

N. On April 4, 2006, the APCO modified the SCR determination issued on December 21, 2005 to reduce the supplemental DCM area to 8.66 square miles and increased the "watch area" to 0.79 square miles (Modified SCR determination).

O. On May 3, 2006, the City filed an appeal of the April 4, 2006 Modified SCR determination with the CARB. The District disagreed that the determination was subject to such an appeal.

P. On May 4, 2006, the City filed a petition for writ of mandate challenging the APCO's April 4, 2006 Modified SCR determination (*City of Los Angeles Department of Water and Power v. Great Basin Unified Air Pollution Control District*, Kern County Superior Court Case No. S-1500-

CV-258678, RJO). The Parties entered into mediation and a temporary stay of the litigation.

AGREEMENT

NOW, THEREFORE, in consideration of the provisions herein contained and to resolve the disputes over methods to address air quality at Owens Lake, including the disputes over the SCR determination issued on December 21, 2005, and modified on April 4, 2006, the City and the District hereby agree as follows:

<u>DUST CONTROL MEASURES (DCMs)</u>

1. The City shall apply DCMs as provided in this Agreement on additional areas of the lake bed beyond the 29.8 square miles required in the 2003 SIP.

   A. The areas on the lake bed on which DCMs will be applied are designated in this Agreement as follows:

      (i) The 12.7 square-mile area of additional DCMs shall be known as the 2006 Supplemental Dust Control Area (SDCA).

      (ii) The 29.8 square miles of DCMs required by the 2003 SIP shall be known as the 2003 Dust Control Area (DCA).

      (iii) The 0.5 square miles of natural drainage channels on the south area of the lake bed shall be known as the Channel Area.

      (iv) The combined 43.0 square miles of DCMs and Channel Area shall be known as the Total Dust Control Area (TDCA).

      (v) The SDCA, DCA, Channel Area and TDCA are delineated on the TDCA Map, attached as Exhibit 1. The SDCA and Channel Area coordinate descriptions are attached as Exhibit 2. The DCA coordinate description is contained in the 2003 SIP.

   B. Minor adjustments may be made to the boundaries of the SDCA upon written request by the City to the District and written approval by the APCO, which approval shall not be unreasonably withheld. In the event of such modification, the boundaries of the TDCA shall also be modified to reflect the modified SDCA boundaries.

   C. The City may, at its sole option, apply DCMs to additional areas outside the TDCA.

   D. The City shall begin full operation of the DCMs within the SDCA as follows:

(i) Moat and row controls shall be operational by October 1, 2009.

(ii) All other controls shall be operational by April 1, 2010.

E. Following the dates set out above in this Section, the City shall continuously operate and maintain the DCMs within the TDCA. The City shall continuously operate and maintain DCMs within the DCA as required under the 2003 SIP, except as otherwise provided in this Agreement.

2. A. The City shall construct within the SDCA a minimum of 9.2 square miles of Shallow Flood dust controls. The Shallow Flood areas are delineated on the Dust Control Measure Map, attached as Exhibit 3.

B. On the remaining 3.5 square miles of the SDCA not specifically designated for Shallow Flood on the DCM Map (Exhibit 3), the City shall

(i) construct Shallow Flood, Managed Vegetation, or gravel cover, as described in the Dust Control Measures Description, attached as Exhibit 4, and which are currently approved as Best Available Control Measures (BACM) under the 2003 SIP; or

(ii) subject to Sections 3, 7 and 8, treat up to 3.5 square miles of the SDCA with the alternative dust control measure known as "Moat and Row," as described in the DCM Description (Exhibit 4).

C. TDCA areas designated as Channel Area represent areas containing natural drainage channels having potentially significant resource issues and regulatory constraints. While these areas are not a part of the SDCA, they shall be addressed as part of the control strategy for the SDCA. However, it is acknowledged that the control strategy in this area may be subject to additional regulatory constraints, design considerations, and impacts caused by adjacent DCMs.

D. The internal control measure boundaries delineated on the DCM Map (Exhibit 3) are approximate and are subject to final written approval by the APCO. The areas designated on the DCM Map (Exhibit 3) for Shallow Flood and Moat and Row may be modified upon written request by the City to the District and written approval by the APCO, which approval shall not be unreasonably withheld.

3. All DCMs within the SDCA shall be designed, constructed, operated and maintained by the City to achieve the initial target minimum dust control efficiencies (MDCEs) shown on the MDCE Map, attached as Exhibit 5. The initial target MDCEs (Target MDCEs):

A. Are based on the results of air quality modeling, as described in the 2003 SIP, conducted by the City and approved by the APCO for the period July 2002 through June 2006;

B. Assume 100 percent control efficiency in the 29.8 square miles of the DCA required under the 2003 SIP, except during the fall and spring ramping periods as described in Section 26, and achievement of the target MDCEs for the areas in the SDCA. Control efficiencies during the fall and spring ramping periods shall be based on modeling that accounts for reduced wetness cover pursuant to Sections 5 and 26;

C. Have been selected to achieve PM_{10} concentrations that will not exceed the federal 24-hour PM_{10} ambient air quality standard of 150 $\mu g/m^3$ (federal standard) at all historic shoreline (elevation 3600 feet above sea level) receptors.

4. Prior to April 1, 2010, the Target MDCEs may be modified, upon request of the City and written approval of the APCO, which approval shall not be unreasonably withheld, if the modified MDCEs meet the criteria set forth in the MDCE Selection Process Spreadsheet, attached as Exhibit 6, pursuant to Section 3.

5. For the Shallow Flood areas identified in DCM Map (Exhibit 3), the percentage of each area that must be wetted shall be based on the Shallow Flood Control Efficiency Curve (SFCE Curve) attached as Exhibit 7, or an update of the SFCE Curve mutually agreeable to the Parties, to achieve the control efficiency levels in the MDCE Map (Exhibit 5).

6. The Parties believe that the City's existing Managed Vegetation site may currently achieve a control efficiency of 99 percent. Therefore, the City shall continue to maintain and the District shall continue to monitor the site to ensure that it achieves 99 percent control efficiency. No later than July 1, 2007, the City shall submit to the District an operation and management plan for the City to maintain cover conditions that achieve 99 percent control efficiency in the Managed Vegetation areas. The plan shall be subject to written approval by the APCO, which approval shall not be unreasonably withheld. Prior to the time that the Managed Vegetation area is in compliance with an approved SIP, the District will not issue a Notice of Violation (NOV) for the existing Managed Vegetation area as long as:

A. From January 1, 2007, to the earlier of July 1, 2007 or the date when the City's operation and management plan is approved by the APCO, the City maintains its current operation and management practices for its Managed Vegetation areas; and

B. After the APCO's written approval of the operation and management plan, the City implements all provisions of its operation and management plan; and

C. The City's Managed Vegetation area site does not cause an exceedance of the federal standard at the historic shoreline.

7. As Moat and Row is not a currently approved BACM dust control measure under the 2003 SIP, the City will develop, in consultation with the District, and conduct Moat and Row Demonstration Projects on the lake bed. These Demonstration Projects will be conducted on two or more locations on the lake bed outside of the DCA. The proposed location of these Demonstration Project areas are shown on attached Moat and Row Demonstration Project Map (Exhibit 8). The actual locations of the projects may be changed by the City, and in such event, the City shall notify the APCO in writing of the changed locations. The City will be the California Environmental Quality Act (CEQA) lead agency for implementation of the Moat and Row Demonstration Projects.

8. Based on results of the Moat and Row Demonstration Projects described in Section 7 and subject to Sections 2 and 3, the City in its sole discretion may decide which DCMs to implement in the areas designated for Moat and Row in Section 2 and Exhibit 3 of this Agreement. The City shall consult with the District before making its decision and inform the District of its decision in writing.

A. Depending on the results of the Moat and Row Demonstration Projects, the measures implemented in these areas by the City may include Moat and Row, enhanced Moat and Row (*e.g.*, closer Moat and Row spacing, Moat and Row with some Shallow Flooding, Moat and Row with some vegetation), combined Moat and Row/Shallow Flood, MDCE-BACM, or BACM.

B. If the City implements Moat and Row, it shall design and construct Moat and Row to achieve the Target MDCEs described in Section 3. The Moat and Row configuration required to achieve these Target MDCEs will be decided solely by the City, after consultation with and written notification to the District.

C. In the event of a dispute regarding the City's proposed decision or action pursuant to Section 8.A or 8.B, either Party may initiate the Dispute Resolution Process pursuant to Section 32.

D. Upon written request of the City, the APCO shall determine in writing if Moat and Row and/or Enhanced Moat and Row constitutes BACM or MDCE-BACM, in accordance with the revisions to the 2003 SIP provided in Section 28.

DUST IDENTIFICATION (DUST ID) PROGRAM

9. The Parties mutually recognize that a method for identifying sources of potential exceedances of the federal standard at the historic shoreline could be developed that is superior to and could replace or modify the current Dust ID Program.

A. The Parties will work cooperatively, with the participation of a mutually agreeable independent third party technical expert or experts under contract to the District and jointly managed by the Parties, in a good faith effort to develop, before April 1, 2010, an improved Dust ID Program. The APCO will implement all mutually-agreeable changes to the Dust ID Program and notify the City in writing of those changes.

B. The District will continue to work with the City after April 1, 2010 to further improve the Dust ID Program and will implement all additional mutually agreeable changes in a written decision.

C. In furtherance of efforts to improve the Dust ID Program:

(i) The Parties will promptly begin a mediated process for refining the Dust ID Program and resolving disputes.

(ii) The Parties will select a mutually agreeable expert or panel of independent third-party technical experts.

(iii) The District, after consultation with the City, will increase the number of PM_{10} monitors at or near the historic shoreline. In all cases, the District will notify the City of the location of the monitors within 30 days of placement of the monitors. If a PM_{10} monitor is located above the historic shoreline, the District will make reasonable attempts to account for non-lake bed sources that may affect the monitor.

(iv) The District, after consultation with the City, will modify the existing sand flux monitor network to concentrate on areas of special interest, and will, in all cases, notify the City of the modifications within 30 days of any modification.

(v) The Parties will establish mutually agreeable model performance measures. Such measures may, but are not required to, include a minimum model performance standard.

(vi) The District will make reasonable efforts to account for impacts of DCM construction activities.

10. The City will lead a joint effort with the District to develop methods for directly measuring PM_{10} emission rates from the lake bed. The District will incorporate mutually agreeable methods into the Dust ID Program.

11. A. If the City is in compliance with Sections 1 and 2 of this Agreement, the following shall apply to the time period before April 1, 2010.

(i) The APCO will not issue any further determinations regarding the need for SCRs that provide for additional requirements beyond those in this Agreement. However, the District will continue to use the Dust ID Program, as that program may be modified pursuant to Sections 9 and 10. The District will periodically advise the City of results in writing and may recommend actions to the City based on the model results.

(ii) Data collected before April 1, 2010 will not be used in future determinations requiring SCRs, except in those areas delineated as Study Areas on the Study Area Map attached as Exhibit 9 and described in Exhibit 2. Data collected from the Study Areas between July 1, 2006 and April 1, 2010 may only be used in SCR determinations after April 1, 2010, and may be used only in accordance with the current form of the Dust ID Program that is in effect after April 1, 2010.

(iii) The District will not issue an order requiring the City to implement any additional controls on any lake bed dust source areas in order to achieve the state PM_{10} standard of 50 micrograms per cubic meter unless compelled to issue such an order by state law.

B. The District shall determine compliance with the state PM_{10} standard based on concentrations only in the surrounding communities, unless otherwise compelled by state law.

12. The City, in consultation with the District, shall annually develop and provide to the District a Performance Monitoring Plan (PMP) to aid in its operation of the Owens Lake dust mitigation program on the Owens Lake bed.

A. The PMP will describe the measurements and methods used to verify the performance of the constructed DCMs and Moat and Row test areas. The PMP will also describe the measurements and methods used to maximize information on dust emissions from areas of special interest.

B. The City shall implement the PMP, and will use the results as a guide for making operational decisions about the type, location, timing, and level of dust control measures needed to prevent exceedances of the federal standard at the shoreline.

C. The District may use information from the PMP to assist in determining the likely sources of dust emissions causing or contributing to exceedances (if any) of the federal standard at the shoreline.

SHALLOW FLOOD BACM REFINEMENT

13. The City shall have the option to conduct field testing to refine the wetness cover requirement to achieve 99 percent control efficiency in Shallow Flood areas within the DCA (Shallow Flood Cover Test).

A. The Shallow Flood Cover Test shall occur on one or more areas totaling not more than 1.5-square-miles, to be selected by the City and approved by the APCO, which approval shall not be unreasonably withheld, from within the TDCA areas requiring 99 percent control.

B. The Shallow Flood Cover Test design shall be prepared by the City and approved by the APCO, which approval shall not be unreasonably withheld, prior to implementation. Based on that design, the APCO will reasonably determine wetness cover requirements for the Shallow Flood Cover Test.

C. The City will be CEQA lead agency for the Shallow Flood Cover Test.

14. If the APCO reasonably determines in writing that DCMs in the TDCA have been operational for one full year (defined as 365 consecutive days) with no exceedance of the federal standard at monitors located at or above the historic shoreline caused solely by sources within the TDCA, the City shall be permitted to reduce the wetness cover by an average of 10 percent over Shallow Flood areas requiring 99 percent control efficiency, excluding areas identified in Section 14.C, provided that:

A. Application of the 10 percent reduction in wetness cover during the Fall and Spring Shallow Flood DCM Compliance periods set out in Sections 25 and 26 shall result in the lower of:

(i) The areal cover resulting from a 10 percent reduction; or

(ii) The areal cover required in Section 26.A.

B. To implement the reductions set out in this Section, the City shall be required to first submit a written Wetness Cover Plan to the District for reducing the wetness cover on the eligible areas. The Wetness Cover Plan shall take into account:

(i) the results of testing carried out pursuant to Section 13, if conducted; and

(ii) the results of fall and spring Shallow Flood wetness cover reduction operations carried out pursuant to Section 26.

C. If, in any year, the Wetness Cover Plan proposes reductions in wetness cover greater than 10 percent in any portion of the Shallow Flood areas covered by the Plan (consistent with the 10 percent limit on the overall average reduction), the City shall obtain the additional written approval of the APCO, which approval shall not be unreasonably withheld.

D. In the event shoreline monitors show an exceedance of the federal standard, whether that exceedance is caused by sources within, outside, or both within and outside of the TDCA, no further reductions in wetness cover shall be permitted for any Shallow Flood area that has contributed to the exceedance, as determined by the methodology in Section 18 and subject to the provisions of Section 16.

E. Except as provided in Section 16, the City may continue to operate using reductions of wetness cover pursuant to a previously approved Wetness Cover Plan.

15. For each Dust Control Season (October 1 of each year through June 30 of the next year) that wetness cover reductions have taken place under the provisions of Section 14, the City shall prepare and submit to the District a written report summarizing the results of the wetness cover reductions within 90 days after conclusion of the corresponding Dust Control Season. The report shall document the percentage of wetness cover for Shallow Flood areas and the effect(s) of wetness cover reductions on PM_{10} concentrations at the historic shoreline.

16. Any areas for which wetness cover has been reduced pursuant to Section 14 and that cause or contribute to an exceedance of the federal standard at the historic shoreline shall be remediated by the City under the Remedial Action Plan requirements pursuant to Sections 18 and 22 below.

A. Subject to APCO written approval, which approval shall not be unreasonably withheld, the City may further reduce the wetness cover beyond that allowed in Section 14 provided that:

(i) The maximum 24-hour PM_{10} shoreline monitor values for at least 365 consecutive days of operation following initiation of the last approved Wetness Cover Plan does not exceed 130 $\mu g/m^3$; and

(ii) The City demonstrates to the reasonable satisfaction of the APCO that the modeled contributions from the lake bed for the same time period set forth in Section 16.A.(i) plus the background of 20 $\mu g/m^3$ do not exceed 120 $\mu g/m^3$ at the historic shoreline.

B. If the monitored values at the historic shoreline exceed 130 $\mu g/m^3$, and it is determined that non-lake bed sources are contributing greater than 20 $\mu g/m^3$, then the District will expeditiously seek to identify and require control of those non-lake bed sources so that the City may continue to implement efficient DCMs on the lake bed.

C. If the City is entitled to further reduce wetness cover pursuant to this Section, the City shall prepare and submit an updated Wetness Cover Plan to the District to describe the wetness cover proposed for the subsequent, applicable Dust Control Season. The updated Wetness Cover Plan shall include:

(i) A map that depicts the eligible Shallow Flood areas;

(ii) The proposed amount of wetness cover for each eligible Shallow Flood area; and

(iii) The method for determining effectiveness of the proposed wetness cover.

D. The Wetness Cover Plan shall be subject to approval of the APCO, which approval shall not be unreasonably withheld.

ACTIONS TO ADDRESS STANDARD VIOLATIONS

17. After May 1, 2010, the APCO will recommence written SCR determinations under the revisions to the 2003 SIP as provided in Section 28. Recommenced determinations will use Dust ID data collected only after April 1, 2010, except as provided in Section 11.A.(ii) for Study Areas, and shall be made at least once in every calendar year.

18. If, pursuant to Section 17, the APCO determines that a monitored or modeled exceedance of the federal standard caused by emissions from the lake bed has occurred at or above the historic shoreline:

A. The APCO, based on all available information, including visual observation, monitoring and modeling, and in consultation with the City, will identify the need for additional controls, monitoring, or both.

B. (i) If the APCO identifies the need for additional controls, the APCO shall issue a SCR determination.

(ii) If the City does not agree with the APCO's determination, the City may, within 60 days of the APCO's determination, submit to the District an Alternative Analysis. If the City submits an Alternative Analysis, the APCO shall consider the Analysis and may withdraw, modify or confirm the SCR determination.

(iii) If the APCO issues a modified SCR determination or confirms the initial SCR determination and the City does not agree with the APCO's action, the City may initiate the Dispute Resolution Process pursuant to Section 32. The APCO may modify the SCR determination based on the Dispute Resolution process.

(iv) In the event the Parties are unable to resolve disagreements over future SCR determinations through the Dispute Resolution Process, the City may appeal future determinations to CARB under the provisions of Health and Safety Code Section 42316 (Section 42316), provided that the Parties expressly intend that this Agreement be the final resolution regarding the existing disputes between the Parties that are the subject of this Agreement. Based on the foregoing, the City stipulates and agrees that all of the provisions and determinations, including the measures and procedures, contained in the 2003 SIP, the provisions of this Agreement to be included in modifications to the 2003 SIP pursuant to this Agreement, and the SCR determination dated April 4, 2006, which the City in good faith disputed, shall be deemed to be valid and reasonable, and that the City will not challenge those provisions or determinations by appeal under Section 42316 or in any other proceeding, including any other administrative or judicial forum. Subject to this Paragraph, the City may challenge any future SCR determination under Section 42316; however any arguments or challenges must be based on data and information that do not currently exist, but that exist after the execution of this Agreement.

C. The City shall prepare and submit for the APCO's consideration and written approval, which approval shall not be unreasonably withheld, a Remedial Action Plan as described in Section 21 to address the exceedance(s). The City shall submit the Remedial Action Plan within 60 days of the date the SCR determination becomes final.

D. The District may, as appropriate, also issue a notice of violation.

19. In the event:

A. The APCO has made a written determination pursuant to Section 18 that an exceedance of the federal standard, occurring after April 1, 2010, resulted from a Control Area or portion of a Control Area treated with Moat and Row; and

B. That Control Area or portion of a Control Area causing the exceedance was remediated by the City as provided in Section 21 below; and

C. That Control Area or a portion of that Control Area is subsequently the sole cause of an exceedance of the federal standard at or above the historic shoreline, (*i.e.*, an exceedance occurred after the City attempted to remediate that area under Section 21);

then the City shall convert that Control Area, or that portion of that Control Area, from Moat and Row to MDCE-BACM or BACM, to address the exceedance described in Section 19.C., for all or the portion of that Control Area that caused the subsequent exceedance, under the time deadlines provided for in Section 24.

20. If the APCO determines that Moat and Row constitutes BACM or MDCE-BACM, then upon issuance of such written determination, the provisions of Section 19 that require the City to convert to BACM or MDCE-BACM may be satisfied by applying the BACM or MDCE-BACM approved under this Section 20.

21. A Remedial Action Plan prepared by the City pursuant to Section 18 will contain a description of:

A. Any and all needed changes, repairs or enhancements to DCMs, including one or some combination of the following:

(i) Maintenance of facilities (*e.g.*, berms, moats and rows);

(ii) Changes to Shallow Flood or Managed Vegetation facilities or operations (*e.g.*, increase in wetness cover extent, improved wetness cover distribution, enhancement of vegetation);

(iii) Augmentation (*e.g.*, more moats and rows) or enhancement (*e.g.*, addition of sand fences, surface wetting, armoring, vegetation, surface roughening) of Moat and Row areas;

(iv) Transition of Moat and Row areas to BACM, or MDCE-BACM.

B. Any and all needed expansion of DCMs, and specific plans for expanding the measures.

C. A schedule for the work to be performed to implement the changes, clearly indicating the point at which facilities will be operational and effective at design levels.

22. The Schedule of Contingency Measures attached to this Agreement as Exhibit 10 sets forth a non-exclusive list of items that shall be included by the City in its Remedial Action Plans, described in Section 21, and the timing required for their implementation.

23. Before any full-scale Moat and Row areas are operational, the City shall submit to the District a conceptual design and schedule for possible implementation of BACM or MDCE-BACM to each Moat and Row area consistent with Section 19. These designs and schedules are the potential contingency measures to be implemented by the City where a transition from Moat and Row to another DCM is needed, or where such transition is required pursuant to Section 19.

24. Areas to be transitioned from Moat and Row to BACM or MDCE-BACM will be operational within the times set forth in the Moat and Row Transition Schedule attached as Exhibit 11. DCMs for new areas will be operational within the times set forth in the DCM Operation Schedule attached as Exhibit 12.

<u>FALL AND SPRING SHALLOW FLOOD DCM COMPLIANCE</u>

25. For the time period from October 16 of each year through May 15 of the next year, the Shallow Flood Control Areas shall be considered to be in compliance with this Agreement and applicable laws and regulations, if the areal wetness cover within each Shallow Flood Control Area in the TDCA meets the MDCE required in Exhibit 6 using the SFCE Curve in Exhibit 7.

26. The provisions set forth in this section shall apply to all Shallow Flood areas with target control efficiencies of 99 percent or more, except those which the City and the District may mutually agree to exclude.

    A. Beginning on April 1, 2010, compliance of TDCA Control Areas with 99 percent control efficiency Shallow Flood requirements shall be as follows:

        (i) Beginning May 16 and through May 31 of every year, Shallow Flood may be reduced to a minimum of 70 percent areal wetness cover.

        (ii) Beginning June 1 and through June 15 of every year, Shallow Flood may be reduced to a minimum of 65 percent areal wetness cover.

        (iii) Beginning June 16 and through June 30 of every year, Shallow Flood may be reduced to a minimum of 60 percent areal wetness cover.

(iv) If for any Shallow Flood area, the percent of areal wetness cover in the periods specified in Sections 26A.(i), (ii) and (iii) is below the minimum percentages specified in those sections, and there were no monitored or modeled exceedances of the federal standard at the historic shoreline, that area will be deemed to be in compliance with this Agreement and applicable laws and regulations if the City demonstrates in writing and the APCO reasonably determines in writing that maximum mainline flow was maintained in the applicable period.

B. From July 1 through September 30 of each year, the City is not required by the 2003 SIP to apply water for dust control, but is required to maintain minimum areal wetness cover as required by applicable environmental documents and approvals.

C. Beginning on April 1, 2010, if modeled or monitoring data shows an exceedance or exceedances of the federal standard at the historic shoreline as a result of excessive dry areas on Shallow Flood Control Areas during the dust control periods for each year between May 16 through June 30, and October 1 through October 15, the provisions of Sections 17 and 18 shall apply.

27. The provisions of Sections 25 and 26 are subject to the results of air quality modeling, to be conducted by the City and approved by the APCO, that demonstrates attainment of the federal standard at the historic shoreline using the reduced areal wetness covers set forth in Section 26. The modeling shall be conducted as described in the 2003 SIP using data for the period July 2002 through June 2006. The control efficiency of the areal wetness covers shall be modeled using the SFCE Curve as provided in Section 5.

<u>REVISION OF THE STATE IMPLEMENTATION PLAN (SIP)</u>

28. A. The APCO will propose a District Board Order that will revise the 2003 SIP to incorporate all of the terms and conditions of this Agreement, except such terms and conditions, if any, that may not lawfully be included in the SIP. The APCO will propose the Board Order and SIP revision at a time sufficient to allow the proposed revisions to be considered and adopted by the District Board by July 1, 2008. The time for consideration and adoption shall take into account, without limitation, the time for legally required environmental review and public notice and hearing. The District Board will act on the proposed SIP revisions by July 1, 2008.

B. If the District Board has the legal ability to act and fails to act by November 1, 2008 on a proposed District Board Order as described in Subsection 28.A, the City may terminate this Agreement by providing written notice to the District, provided, however, that the City will not provide such notice prior to the conclusion of the Dispute Resolution Process pursuant to Section 32, which process may be initiated by either Party.

C. The Parties have developed this Agreement with the intention that its provisions will be incorporated into a revision of the 2003 SIP and are consistent with applicable provisions of the Health and Safety Code, including Section 42316, and applicable provisions of federal law regarding attainment of the NAAQS.

D. The APCO shall confer in good faith with the City to develop procedures to modify and authorize MDCE-BACM for incorporation into the revisions to the 2003 SIP.

E. The District will be CEQA lead agency and will prepare, in consultation with the City, and will consider for certification on or before March 1, 2008 an environmental impact report (EIR) on the proposed SIP revisions.

F. (i) In the event:

(a) the District Board adopts a District Board Order revising the 2003 SIP that does not incorporate all the terms and conditions of this Agreement, except such terms and conditions, if any that may not lawfully be included in the SIP; or

(b) the District Board adopts a District Board Order revising the 2003 SIP that incorporates all the terms and conditions of this Agreement except such terms and conditions, if any, that may not lawfully be included in the SIP, and subsequent judicial action causes the revised SIP to be materially inconsistent or materially in conflict with the terms and conditions of this Agreement,

the City may terminate this Agreement in the case of Section 28.F(i)(a), and either Party may terminate this Agreement in the case of Section 28.F(i)(b), within 30 days of such action by providing written notice to the other Party.

(ii) If the City does not elect to terminate this Agreement pursuant to Section 28.F(i) and any inconsistencies or conflicts exist between this Agreement that preclude compliance with both, the provisions of the District Board Order shall prevail.

G. The City will support and will not appeal or in any other way challenge or oppose revisions to the 2003 SIP and resulting District Board Order that incorporate all of the terms and conditions of this Agreement, except such terms and conditions, if any, that may not lawfully be included in the SIP. After issuance of the District Board Order provided for in this Section, the City shall not challenge the order under CEQA to the extent that Order is consistent with this Agreement.

H. In the event the District Board fails to certify the EIR by March 1, 2008 or to act on the proposed SIP revisions by July 1, 2008, the Parties shall meet and confer as provided in Section 33.A.

I. Any provisions of this Agreement that are incorporated into the District Board Order as provided in Section 28.A. shall, upon adoption of that Order by the District Board, cease to have any further force and effect as part of this Agreement, and shall instead be effective as part of the District Board Order.

J. Any provisions of this Agreement that are not incorporated into the District Board Order as provided in Section 28.A shall remain in full force and effect as part of this Agreement until May 1, 2012, at which time those provisions shall cease to be of any further force or effect as part of this Agreement, provided that the Parties may mutually agree in writing to extend this date.

COVER MEASUREMENT TECHNIQUES AND PERFORMANCE SPECIFICATIONS

29. The District and City will collaboratively develop wetness and vegetative cover measurement techniques, control efficiency relationships, and compliance specifications. Final acceptance of those cover measurement techniques and compliance specifications with regulatory impact will be at the sole discretion of the APCO.

KEELER DUNES

30. The Parties acknowledge that dust emissions from the area known as the Keeler Dunes may cause or contribute to exceedances of federal and state standards for PM_{10}. The City hereby agrees to cooperate with the District and other federal, state and local agencies and experts as necessary to develop a plan to reduce dust emissions from the Keeler Dunes.

COOPERATION BETWEEN PARTIES AND DISPUTE RESOLUTION

31. In carrying out the terms of this Agreement, the Parties intend to cooperate fully and to consult with each other effectively and on a regular basis. The Parties will make good faith efforts to provide each other with relevant documents and

technical information in a timely manner, and they will keep each other informed of their respective progress in actions to implement the actions set forth in this Agreement, including, without limitation, progress in entering into consultant and construction contracts and in securing permits from agencies with permitting authority.

32. Notwithstanding the Parties' commitment to cooperate in implementing the terms of this Agreement, they recognize that differences may arise between them. To address this situation, the Parties agree that, in the event either Party believes that a dispute exists regarding implementation or interpretation of any provision of this Agreement, that Party may, by informing the other Party in writing within 21 days of the decision or determination, action or proposed action triggering the dispute, initiate non-binding mediation between the Parties. A party may not seek non-binding mediation for issues that were already the subject of mediation under this Section unless both Parties agree in writing.

A. The mediator shall be a mediator mutually acceptable to the Parties. The Parties may also by mutual agreement include in the mediation, one or more of the technical experts selected pursuant to Section 9.C.(ii), or any other technical experts, such experts to be under contract to the District and jointly managed by the Parties. The City shall be responsible for the cost of the mediator and the technical experts pursuant to Health and Safety Code Section 42316. The mediation will be conducted and completed within 60 days of the notice initiating the Dispute Resolution Process unless that time period is extended by mutual agreement of the Parties. The mediation will be conducted under all applicable California laws regarding mediation, including but not limited to Cal. Evidence Code Sections 1115-1128.

B. Neither Party will commence any litigation concerning the implementation of terms of this Agreement unless that Party has first initiated the mediation described in this Section, and the sooner of the following two events takes place:

(i) Sixty (60) days has expired from the date that Party first sent written notice to commence the mediation; or

(ii) Both Parties agree, or the mediator(s) states, in writing that the mediation has been completed.

(iii) Notwithstanding the provisions of this Section 32.B, a Party may commence litigation at an earlier time if necessary to pursue a claim or cause of action that would otherwise be time barred under an applicable statute of limitations.

C. If the Dispute Resolution Process pursuant to this Section 32 is initiated to address a dispute regarding a SCR determination issued by the APCO pursuant to Section 18.B, then that SCR determination shall not be deemed final until the conclusion of this process under Section 32.B.

D. Nothing in this section is intended to or shall be construed to restrict or eliminate a Party's right to utilize available legal remedies following completion of the mediation process.

EXTENSIONS OF TIME

33. A. In the event that the District

(i) Anticipates that it will fail to certify or fails to certify an environmental impact report on the proposed SIP revisions and related actions by March 1, 2008; or

(ii) Anticipates that it will fail to act on or fails to act on a proposed District Board Order pursuant to Section 28.A by July 1, 2008,

the District shall promptly notify the City, and Parties shall meet and confer to determine what if any revisions to other dates contained in this Agreement may be appropriate. The Parties may mutually agree to the participation of a mediator in the meet and confer process.

B. In the event the City

(i) Anticipates that it will be unable to complete implementation or fails to complete implementation of moat and row controls pursuant to this Agreement by October 1, 2009; or

(ii) Anticipates that it will be unable to complete implementation or fails to complete implementation of all other controls by April 1, 2010,

the City may seek relief for such failure or delay by obtaining a variance from the Hearing Board of the Great Basin Unified Air Pollution Control District pursuant to District Regulation VI and all applicable law for variance relief from a District Order, including but not limited to Health and Safety Code Section 42350 *et seq*. In such event, the District shall, at the request of the City, meet with the City, prior to or after the filing of a request for a variance, in order to ascertain whether the District will support the City's variance request. In the event the District will not support the City's variance request, the City may invoke the Dispute Resolution Process pursuant to Section 32.

C. Nothing in this Section is intended to or shall limit the ability of the City to seek a variance from requirements not included in this Section.

D. Each Party will undertake to inform the other Party as early as practicable of the fact that it anticipates that it will not meet or has failed to meet any of the dates set out in this Section.

34. In the event either Party claims that the other Party is in material breach of the terms of this Agreement, including without limitation, a claim by the District that the City is in material breach under Section 11, the Party claiming the breach shall provide written notice of the claimed breach to the other Party. In the event the Party claimed to be in breach contests such claim, the issue shall be subject to the Dispute Resolution Process in Section 32.

LAWSUIT/APPEAL SETTLEMENT CONDITIONS

35. Within 15 days of execution of this Agreement, the APCO shall issue a revised SCR determination that incorporates the terms of this Agreement and that supersedes all previous determinations.

36. Upon issuance by the APCO of the revised SCR determination as described in Section 35, the City shall immediately commence the process for implementing additional DCMs on the Owens Lake bed consistent with the terms of this Agreement.

37. Upon issuance by the APCO of the revised SCR determination as described in Section 35, the City shall within seven days dismiss with prejudice its CARB appeals and the litigation against the District as described in the Recitals at Paragraphs L, O. and P.

DEFINITIONS

38. Definitions of terms used in this Agreement are contained herein and in Exhibit 13. Where specifically identified in Exhibit 13, these terms as used in this Agreement and Exhibits shall have the meanings provided in this Exhibit 13. Where no definition is provided herein or in Exhibit 13, the words and terms shall have their meaning as provided in the federal Clean Air Act or state air pollution law in the Health and Safety Code, and where no definition is found there, shall have their ordinary meaning as read in the context of this Agreement and consistent with the expressed intent of the Parties.

NOTICES

39. Whenever, under the terms of this Agreement, written notice is required to be given or a report or other document is required to be sent by one Party to another, it shall be sent by overnight mail and directed to the individual at the address

specified below, unless that individual or his or her successor gives notice of a change to the other Party in writing.

As to the City:

Ronald F. Deaton
General Manager
Los Angeles Department of Water and Power
111 North Hope Street, Room 1550
Los Angeles, CA 90012

As to the District:

Theodore D. Schade
Air Pollution Control Officer
Great Basin Unified Air Pollution Control District
157 Short Street
Bishop, California 93514

ADDITIONAL PROVISIONS

40. By this Agreement, the City and the District intend to settle their disputes regarding methods to address air quality issues at Owens Lake, including disagreements over the SCR determination issued on December 21, 2005, and the Modified SCR determination issued on April 4, 2006.

41. This Agreement is the final integrated agreement between the Parties regarding the matters addressed herein, and may not be modified except in a writing signed by both Parties.

42. This Agreement shall be construed in accordance with the laws of the State of California.

43. In the event any provision of this Agreement is judicially determined to be unenforceable, the Parties shall meet and confer and following such meeting, the Parties may amend the Agreement, or continue the Agreement without amendment, or either Party may terminate the Agreement.

44. This Agreement shall not create any rights in any third party.

45. No failure by a Party to insist on strict performance of any term or condition of this Agreement shall constitute a waiver of such term or condition or a breach hereof.

46. Each Party represents that their respective signatories below have the authority to bind them to the terms of this Agreement.

REVIEWED AND AGREED TO:

Dated: November 30, 2006

Ronald F. Deaton
General Manager, Los Angeles Department of Water and Power

The City of Los Angeles
By and Through the
Los Angeles Department of Water and Power

Dated: December 4, 2006

Henry "Skip" Veatch
Board Chairman

Great Basin Unified Air Pollution Control District

APPROVED AS TO FORM AND LEGALITY
ROCKARD J. DELGADILLO, CITY ATTORNEY

NOV 30 2006

BY JULIE A. CONBOY
Deputy City Attorney

List of Exhibits

1. Total Dust Control Area Map
2. 2006 Supplemental Dust Control Area Coordinate Description
3. Dust Control Measure Map
4. Dust Control Measures Description
5. Minimum Dust Control Efficiency Map
6. MDCE Selection Process Spreadsheet
7. Shallow Flood Control Efficiency Curve
8. Moat and Row Demonstration Project Location Map
9. Study Area Map
10. Schedule of Contingency Measures
11. Moat and Row Transition Schedule
12. DCM Operation Schedule
13. Definitions

EXHIBIT 1 -- TOTAL DUST CONTROL AREA MAP

The Total Dust Control Area (TDCA) is comprised of the 2006 Supplemental Dust Control Area (SDCA) and the 2003 Dust Control Area (DCA).

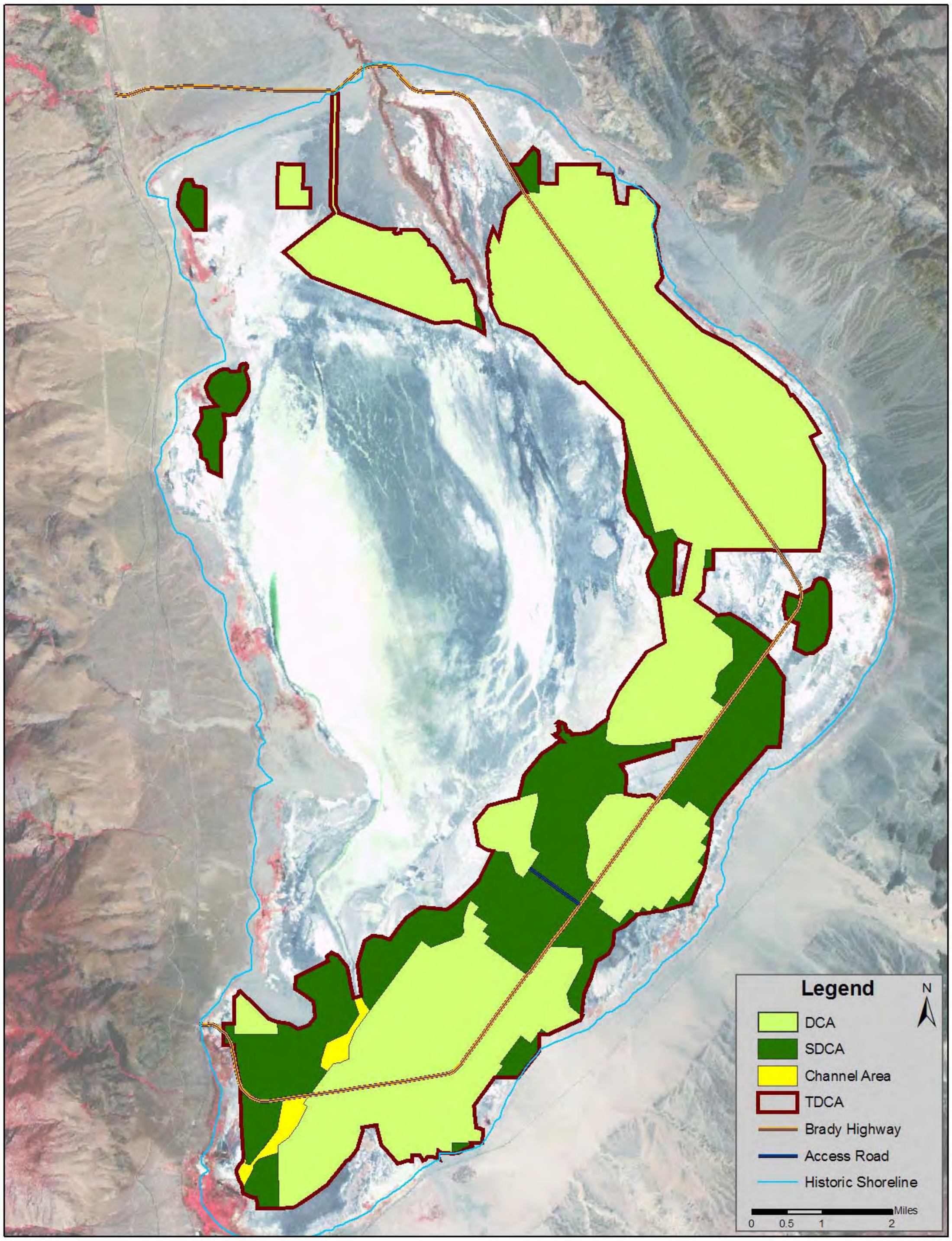

EXHIBIT 2 -- 2006 SUPPLEMENTAL DUST CONTROL AREA COORDINATE DESCRIPTIONS

KEY MAP

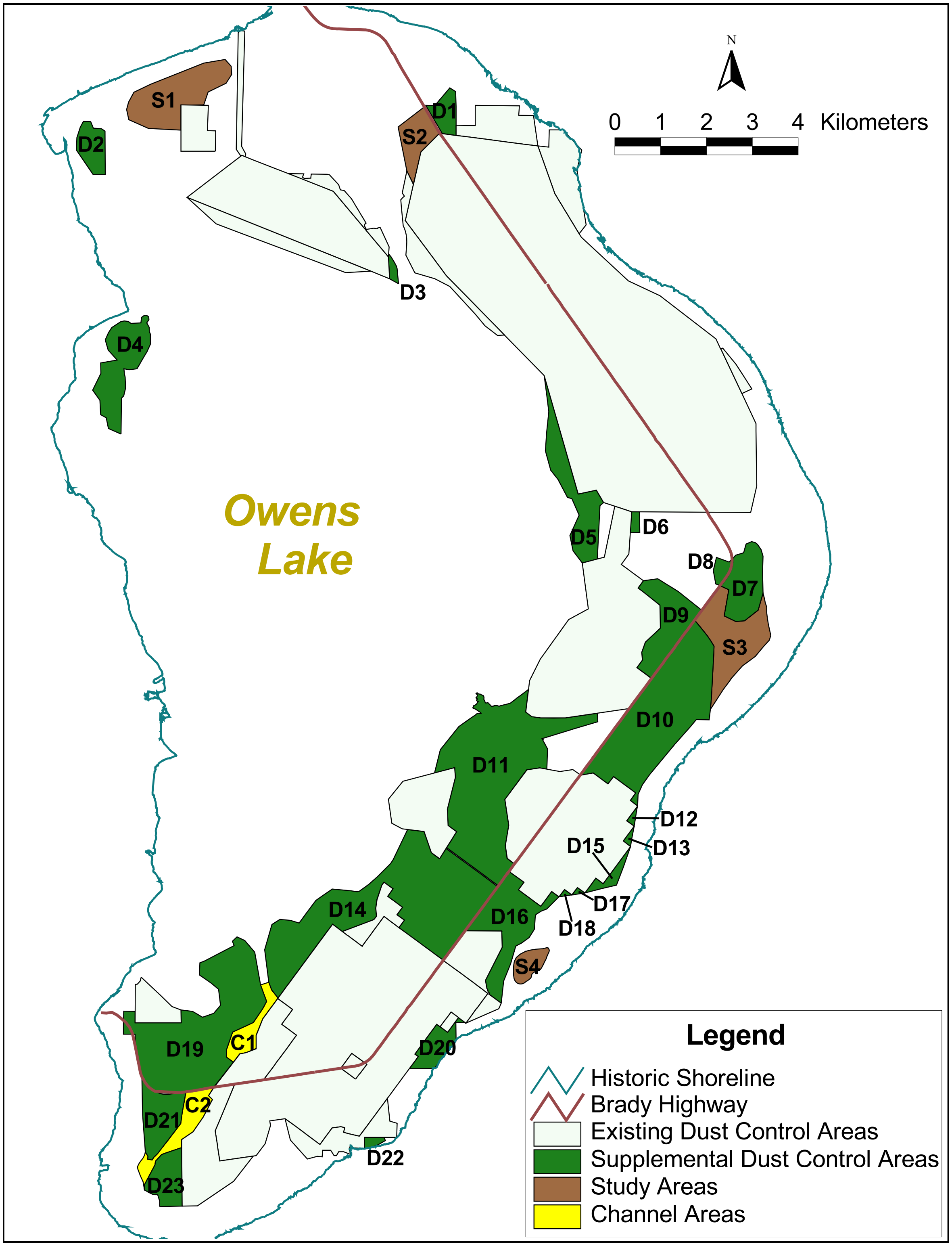

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EXHIBIT 2 -- Owens Lake 2006 Supplemental Dust Control Area Coordinate Descriptions

Area ID	Area (miles)	Area type	Coordinates(UTM Zone11 meters NAD83) X-coordinates	Y-coordinates
D1	0.16	SDCA	416,001.0310	4,042,347.3789
			415,701.7500	4,042,385.7617
			415,343.2810	4,042,999.8633
			415,539.4060	4,042,999.0234
			415,866.3750	4,043,383.8359
			415,994.4060	4,043,304.2109
			416,002.6250	4,042,981.9922
			416,005.6250	4,042,568.5234
			416,001.0310	4,042,347.3789
D2	0.21	SDCA	408,085.5000	4,041,493.3164
			407,718.8130	4,042,027.7422
			407,731.5000	4,042,299.3945
			407,804.9060	4,042,524.2148
			407,873.2810	4,042,654.1211
			408,032.2500	4,042,647.6875
			408,089.5630	4,042,502.0625
			408,267.6560	4,042,491.4219
			408,347.0630	4,042,440.3203
			408,348.9690	4,041,492.4844
			408,085.5000	4,041,493.3164
D3	0.03	SDCA	414,747.2500	4,039,108.7500
			414,550.5000	4,039,224.6641
			414,528.0310	4,039,697.5156
			414,532.5000	4,039,759.7891
			414,583.3750	4,039,699.2617
			414,643.3130	4,039,605.6250
			414,700.5000	4,039,498.9766
			414,718.6880	4,039,441.7188
			414,729.1250	4,039,314.2500
			414,747.2500	4,039,108.7500
D4	0.59	SDCA	408,694.5000	4,035,836.9883
			408,417.2190	4,035,957.7344
			408,370.5940	4,036,191.9453
			408,249.5940	4,036,258.3164
			408,231.6880	4,036,571.0625
			408,075.5000	4,036,791.1719
			408,254.4060	4,037,157.2813
			408,249.9060	4,037,387.3789
			408,606.5630	4,037,448.5391
			408,414.0000	4,037,664.3359
			408,348.8750	4,037,888.7227
			408,415.9060	4,038,042.2422
			408,494.0000	4,038,156.0977
			408,687.9380	4,038,284.6484
			408,762.7190	4,038,303.7813
			408,853.0940	4,038,290.2422
			408,911.3130	4,038,246.2109
			409,028.9380	4,038,251.5742
			409,126.1560	4,038,258.7344
			409,134.0630	4,038,309.6602
			409,144.5940	4,038,382.5547
			409,201.0630	4,038,424.0508
			409,255.5940	4,038,422.9180
			409,299.1250	4,038,391.3789
			409,304.7190	4,038,329.9609
			409,254.9380	4,038,259.1797
			409,308.0940	4,038,163.0195
			409,312.7190	4,038,061.7695
			409,335.7190	4,038,017.0195
			409,334.3750	4,037,792.3008
			409,260.5630	4,037,628.4492
			409,184.9060	4,037,508.1055
			409,044.0630	4,037,256.8359
			408,869.9060	4,037,236.6055
			408,755.8130	4,037,260.8867
			408,768.2810	4,037,143.0156
			408,784.9690	4,037,079.6914
			408,789.7190	4,036,817.3555
			408,751.4060	4,036,667.7344
			408,706.5940	4,036,616.2422
			408,694.5000	4,035,836.9883

Area ID	Area (miles)	Area type	Coordinates(UTM Zone11 meters NAD83) X-coordinates	Y-coordinates
D5	0.57	SDCA	418754.0310	4033026.5000
			418552.9690	4033287.6914
			418484.0000	4033621.1133
			418689.0940	4034066.4102
			418529.0310	4034424.5078
			418434.8130	4034452.0664
			418325.1880	4034653.5234
			418224.7810	4034845.3438
			418067.7500	4035047.7852
			417953.1880	4035467.4961
			417980.5000	4035865.3203
			418027.9060	4036319.6094
			417924.4060	4037110.5117
			418666.3750	4034527.9844
			419065.6880	4034610.9648
			419223.4690	4034342.1406
			419141.3750	4034271.8047
			419084.1880	4033110.8086
			418754.0310	4033026.5000
D6	0.03	SDCA	419801.2810	4033687.7539
			419831.7500	4034141.1016
			420006.8130	4034139.3281
			420012.7190	4033690.4844
			419801.2810	4033687.7539
D7	0.43	SDCA	422105.2500	4031749.0176
			421854.9690	4031871.4102
			421952.1880	4032442.4199
			421827.1560	4032498.3555
			421778.4380	4032522.0762
			421882.0310	4032660.6934
			421931.3130	4032728.7031
			421954.3130	4032765.7129
			421966.3130	4032785.8828
			421992.7810	4032841.0703
			422013.5310	4032894.8164
			422030.0630	4032956.1914
			422039.5000	4033014.7422
			422042.1560	4033068.7461
			422042.4380	4033082.8008
			422040.7810	4033127.2188
			422103.3750	4033191.3320
			422274.9380	4033248.8359
			422331.4380	4033437.2383
			422451.9060	4033492.2617
			422530.2190	4033470.0195
			422579.0940	4033430.6797
			422659.7190	4033313.9453
			422698.6880	4033173.2383
			422688.0630	4032830.0469
			422701.7500	4032367.5195
			422592.2190	4031994.7988
			422299.6560	4031762.5020
			422105.2500	4031749.0176
D8	0.06	SDCA	421758.4690	4032529.3477
			421668.6250	4032569.9238
			421615.5310	4032859.4297
			421680.6250	4033146.5156
			421959.5000	4033044.5586
			422021.5000	4033108.1875
			422022.5630	4033079.4023
			422019.3130	4033018.7031
			422010.1880	4032960.1484
			421994.8130	4032902.9766
			421977.7500	4032858.2227
			421948.4060	4032795.7422
			421918.7190	4032746.2988
			421884.3440	4032697.7148
			421806.2810	4032593.7305
			421758.4690	4032529.3477

EXHIBIT 2 -- Owens Lake 2006 Supplemental Dust Control Area Coordinate Descriptions

Area ID	Area (miles)	Area type	Coordinates(UTM Zone11 meters NAD83) X-coordinates	Y-coordinates
D9	0.53	SDCA	420,265.8440	4,030,508.7188
			419,947.7500	4,030,741.5176
			420,067.1880	4,030,907.7324
			420,051.5940	4,031,073.7461
			420,132.5000	4,031,300.5000
			420,460.9690	4,031,604.7441
			420,449.4060	4,032,103.9551
			419,975.9690	4,032,480.4902
			420,091.3750	4,032,635.9316
			420,399.6560	4,032,679.1270
			420,847.1880	4,032,406.2988
			421,363.7810	4,031,994.1230
			420,995.8750	4,031,495.0273
			420,265.8440	4,030,508.7188
D10	1.75	SDCA	419,965.0000	4,027,728.2520
			419,803.2190	4,027,847.7363
			419,922.8440	4,028,009.4902
			419,437.5940	4,028,368.0176
			419,317.9690	4,028,206.2617
			418,994.5310	4,028,445.2656
			418,730.3440	4,028,397.0371
			419,406.8750	4,029,323.4316
			421,010.9060	4,031,484.3145
			421,216.1560	4,031,761.8594
			421,439.0940	4,031,498.2363
			421,631.0310	4,031,208.7773
			421,571.8750	4,030,077.3184
			421,548.9690	4,029,833.7383
			421,523.2500	4,029,607.1328
			421,241.1880	4,029,607.8887
			421,116.0000	4,029,457.7559
			420,776.0000	4,029,075.9551
			420,233.7500	4,028,421.8027
			420,070.9690	4,028,193.2832
			419,973.2500	4,027,978.3457
			419,965.0000	4,027,728.2520
D11	2.32	SDCA	416,924.2190	4,025,991.8965
			416,906.7190	4,026,000.2598
			416,817.3750	4,026,065.2832
			415,808.9380	4,026,810.0977
			415,803.8440	4,026,822.5840
			415,810.1250	4,026,837.9219
			416,016.5310	4,027,163.7559
			415,829.9690	4,027,301.7383
			415,812.0000	4,027,654.7500
			415,987.3440	4,028,348.8008
			415,969.6880	4,028,562.7461
			415,530.3750	4,028,446.4922
			415,660.2500	4,028,955.4551
			416,062.8130	4,029,458.0664
			416,386.1560	4,029,683.9746
			416,436.9060	4,029,720.7148
			416,449.5000	4,029,732.7207
			416,468.5940	4,029,742.7246
			416,489.8750	4,029,746.4355
			416,529.4060	4,029,741.9941
			416,547.9690	4,029,741.4180
			416,541.4060	4,029,755.8789
			416,528.0940	4,029,767.9277
			416,515.2190	4,029,777.7969
			416,501.9690	4,029,786.2637
			416,489.6560	4,029,794.9004
			416,430.1250	4,029,834.6543
			416,415.3750	4,029,843.4570
			416,400.7190	4,029,849.4766
			416,387.3130	4,029,856.1563
			416,372.5940	4,029,860.3105
			416,368.5310	4,029,870.0703
			416,375.7810	4,029,880.6270
			416,384.4690	4,029,895.7617
			416,385.5310	4,029,910.9023
			416,395.3130	4,029,918.6621
			416,406.0630	4,029,922.9727
			416,419.9060	4,029,929.8086
			416,435.1560	4,029,936.6543
			416,449.2500	4,029,947.3340
			416,459.1250	4,029,961.2246
			416,462.9690	4,029,976.8418
			416,471.5630	4,029,988.3965

Area ID	Area (miles)	Area type	Coordinates(UTM Zone11 meters NAD83) X-coordinates	Y-coordinates
D11 continued	2.32	SDCA	416481.0000	4029994.3359
			416483.2500	4030000.4590
			416476.4690	4030004.0684
			416464.6250	4030013.5332
			416452.1250	4030020.7266
			416447.3130	4030031.0762
			416454.8750	4030042.8809
			416467.7500	4030052.9766
			416466.0630	4030067.6035
			416454.5310	4030077.5586
			416440.6250	4030076.0938
			416437.6250	4030084.6914
			416445.8130	4030098.3496
			416459.0310	4030110.6875
			416465.9060	4030126.0488
			416467.1560	4030142.7871
			416461.5310	4030157.1523
			416450.1560	4030168.0938
			416439.0940	4030177.2402
			416443.8750	4030188.7227
			416458.4380	4030192.3809
			416470.3130	4030190.8789
			416479.0310	4030177.9727
			416493.8130	4030171.2637
			416510.6250	4030166.2656
			416527.2190	4030165.8828
			416541.7810	4030161.9238
			416568.0630	4030143.3945
			416585.0000	4030137.3281
			416601.6250	4030130.7734
			416608.7190	4030112.7188
			416614.8750	4030093.7324
			416614.1560	4030081.1367
			416606.9690	4030057.0176
			416610.2810	4030041.6328
			416621.0310	4030029.7910
			416626.8440	4030016.4492
			416634.6560	4030003.4863
			416639.6560	4029988.0273
			416642.2500	4029973.2676
			416656.7190	4029972.4727
			416688.3750	4029977.5293
			416704.9380	4029976.5762
			416715.9690	4029964.5742
			416723.1250	4029949.7949
			416734.4690	4029937.7109
			416747.7190	4029929.2070
			416759.0310	4029916.4004
			416768.4690	4029902.2207
			416781.8130	4029898.3633
			416790.3750	4029900.3945
			416827.0940	4029907.2129
			416838.2500	4029915.7813
			416845.7500	4029917.9492
			416852.5940	4029916.0938
			416867.9690	4029916.1543
			416880.3440	4029917.7637
			416895.6880	4029914.7402
			416925.9380	4029904.3965
			416940.7190	4029903.4805
			416954.8130	4029907.8730
			416966.3750	4029914.2246
			417119.3130	4029946.7070
			417187.6250	4029971.9180
			417582.2500	4030268.0078
			417521.0310	4029772.5176
			417701.5630	4029667.0430
			417771.4380	4029656.0293
			417852.7810	4029647.5566
			418130.3750	4029643.4648
			418383.2810	4029647.0859
			419083.7810	4029748.1953
			419086.1880	4029746.9258
			419093.6560	4029564.0527
			417887.0630	4029198.4668
			417896.1560	4029182.4668
			417881.5000	4029187.7246
			418000.2190	4028968.8594
			417985.8130	4028531.7539
			417825.0940	4028556.4668
			417545.0000	4028513.0254

EXHIBIT 2 -- Owens Lake 2006 Supplemental Dust Control Area Coordinate Descriptions

Area ID	Area (miles)	Area type	Coordinates(UTM Zone11 meters NAD83) X-coordinates	Y-coordinates
D11 continued	2.32	SDCA	417,068.6250	4,027,867.9766
			417,152.6880	4,027,307.1758
			417,077.1880	4,026,864.2910
			417,117.7810	4,026,581.1016
			417,277.7500	4,026,460.9707
			416,924.2190	4,025,991.8965
D12	0.02	SDCA	419,887.8440	4,027,285.2500
			419,726.0310	4,027,404.7344
			419,965.0000	4,027,728.2520
			419,949.5310	4,027,659.1582
			419,887.8440	4,027,285.2500
D13	0.02	SDCA	419,810.5000	4,026,842.2539
			419,648.7190	4,026,961.7383
			419,772.4690	4,027,130.8359
			419,887.8440	4,027,285.2500
			419,880.3750	4,027,234.3164
			419,832.8130	4,026,984.5820
			419,810.5000	4,026,842.2539
D14	2.46	SDCA	412,117.6560	4,023,538.0977
			411,983.4060	4,023,714.6152
			411,915.1560	4,023,883.7793
			411,828.0940	4,024,594.2207
			411,988.0310	4,025,141.2695
			412,161.8440	4,025,254.5859
			412,387.4060	4,025,234.3184
			412,577.3130	4,025,175.8184
			412,752.9380	4,025,413.6777
			412,942.5940	4,025,667.2090
			413,298.0630	4,025,913.1816
			413,700.7190	4,025,878.1113
			413,843.4060	4,025,859.0313
			413,892.3750	4,025,869.0625
			414,103.4380	4,026,021.7207
			414,294.0310	4,026,188.3672
			414,574.5630	4,026,473.5742
			414,628.3130	4,026,552.7695
			414,946.8130	4,027,212.3789
			415,303.7810	4,027,171.2480
			415,463.6880	4,026,711.0117
			415,639.0630	4,026,577.9492
			415,777.6250	4,026,784.4590
			415,787.8440	4,026,793.4668
			415,793.6560	4,026,794.4512
			416,290.3440	4,026,429.5527
			416,545.3750	4,026,241.2695
			416,908.5000	4,025,969.6309
			416,207.2500	4,025,017.7598
			415,765.2810	4,024,422.9277
			415,712.3440	4,024,368.7461
			414,755.6880	4,025,075.7559
			414,875.1560	4,025,237.5156
			414,715.5000	4,025,356.9941
			414,832.8440	4,025,518.7598
			414,509.4060	4,025,757.7637
			414,628.8750	4,025,919.4863
			414,432.8750	4,026,064.2539
			414,383.9380	4,025,997.9883
			414,274.7500	4,025,678.2109
			414,249.7810	4,025,496.0098
			414,266.4690	4,025,323.2305
			414,210.4380	4,025,245.9863
			413,519.9380	4,024,988.5723
			413,307.2500	4,025,145.7637
			413,144.4690	4,024,931.4102
			412,117.6560	4,023,538.0977
D15	0.08	SDCA	418,812.6560	4,025,829.9941
			419,051.1560	4,026,152.9863
			419,213.4060	4,026,034.2168
			419,810.5000	4,026,842.2539
			419,655.1250	4,026,404.8789
			419,499.9380	4,025,999.3496
			419,182.9690	4,025,925.2813
			418,812.6560	4,025,829.9941

Area ID	Area (miles)	Area type	Coordinates(UTM Zone11 meters NAD83) X-coordinates	Y-coordinates
D16	0.70	SDCA	416987.0630	4023427.0801
			416718.5630	4023625.5098
			416734.5310	4023647.0078
			416700.3440	4023672.5195
			416689.5630	4023734.1953
			416678.1560	4023741.8613
			416644.1560	4023925.0195
			417010.6880	4024645.2734
			417000.8130	4024984.0566
			417004.5630	4024995.9414
			416997.8130	4025001.7578
			416224.2500	4025007.0430
			416932.7810	4025971.6777
			417170.5000	4026294.0039
			417483.0940	4026061.2461
			417363.6250	4025899.4863
			417848.8440	4025541.0000
			418087.8130	4025864.5176
			418249.6250	4025744.9961
			417981.1560	4025483.1621
			417862.3130	4025432.8262
			417742.6560	4025357.7832
			417731.0940	4025299.8848
			417711.4060	4025042.9023
			417596.9060	4024857.0391
			417427.9690	4024735.2051
			417308.1560	4024673.9160
			417192.2500	4024288.4082
			417038.6560	4023907.3789
			416987.0630	4023427.0801
D17	0.01	SDCA	418812.6560	4025829.9941
			418722.7810	4025817.3457
			418531.3750	4025787.7188
			418650.8440	4025949.5527
			418812.6560	4025829.9941
D18	0.01	SDCA	418250.0940	4025745.5586
			418369.5630	4025907.3164
			418531.2190	4025787.8750
			418422.7500	4025775.2305
			418250.0940	4025745.5586
D19	1.88	SDCA	410989.2810	4022251.9551
			411145.7810	4022140.5918
			410728.5630	4021605.7773
			410525.7190	4021575.8516
			410434.2500	4021553.4805
			410330.1560	4021538.0020
			410249.0940	4021523.9121
			410165.6880	4021513.8320
			410012.7810	4021489.0801
			409988.7810	4021485.5020
			409958.9380	4021487.3027
			409834.5940	4021472.0918
			409710.8750	4021458.8867
			409588.2190	4021468.2129
			409472.9060	4021506.2676
			409364.2190	4021564.2617
			409273.0310	4021648.9043
			409231.3750	4021698.0781
			409192.6560	4021749.2871
			409142.4380	4021863.0625
			409121.8750	4021936.3730
			409108.8130	4021989.7910
			409094.0000	4022070.1055
			409085.6880	4022117.5977
			409078.5310	4022146.7773
			409061.1250	4022247.9473
			409045.9690	4022310.3633
			409033.1250	4022381.5703
			409029.3750	4022398.8301
			409009.4380	4022518.7207
			409000.8440	4022749.8164
			408748.8130	4022752.2285
			408748.6880	4022994.9199
			408752.0000	4023250.6855
			409002.0630	4023249.9121
			408999.6250	4023000.2637
			410005.0940	4022997.9844
			410001.1880	4023280.3379
			410254.3750	4023245.9746

EXHIBIT 2 -- Owens Lake 2006 Supplemental Dust Control Area Coordinate Descriptions

Area ID	Area (miles)	Area type	Coordinates(UTM Zone11 meters NAD83) X-coordinates	Y-coordinates
D19 continued	1.88	SDCA	410,472.1880	4,023,123.1172
			410,718.0630	4,023,206.8965
			410,862.1250	4,023,378.8164
			410,821.5940	4,023,731.0039
			410,665.3750	4,023,862.7910
			410,401.5000	4,024,041.8867
			410,411.4380	4,024,308.5215
			410,520.6560	4,024,349.3066
			411,162.2810	4,024,681.8047
			411,124.9690	4,024,778.6250
			411,222.3440	4,024,873.7930
			411,392.4060	4,024,792.1602
			411,607.8130	4,024,539.2461
			411,737.1560	4,023,825.0313
			411,867.2500	4,023,463.2520
			411,784.7500	4,023,306.3613
			411,582.4060	4,023,006.9551
			411,126.7810	4,022,795.5957
			410,994.2500	4,022,416.6367
			410,989.2810	4,022,251.9551
D20	0.21	SDCA	414,982.2190	4,021,997.8164
			415,176.7190	4,022,263.2852
			415,103.2190	4,022,320.4727
			415,581.2500	4,022,965.4922
			415,817.9380	4,022,790.5078
			416,056.9060	4,023,113.9902
			416,207.6250	4,023,003.7656
			415,998.3750	4,023,002.3203
			416,002.5310	4,022,602.1270
			415,526.5000	4,022,002.0215
			414,982.2190	4,021,997.8164
D21	0.39	SDCA	409,784.0630	4,021,446.5840
			409,836.5940	4,021,452.1992
			409,959.4380	4,021,467.4043
			409,986.8440	4,021,465.6152
			410,014.9380	4,021,469.1094
			410,109.0000	4,021,484.2637
			410,027.5940	4,021,036.2754
			409,998.0310	4,020,801.4766
			409,487.5940	4,020,143.3262
			409,409.3130	4,020,065.3262
			409,373.6560	4,020,006.3652
			409,360.9380	4,020,010.4766
			409,276.4690	4,020,023.0879
			409,280.3750	4,020,086.8984
			409,223.5310	4,020,182.5996
			409,166.6250	4,020,986.3672
			409,146.5630	4,021,804.0762
			409,176.1250	4,021,738.1621
			409,218.6880	4,021,681.9980
			409,255.5940	4,021,639.3984
			409,351.8750	4,021,549.4316
			409,464.4690	4,021,488.9551
			409,583.4380	4,021,449.5684
			409,710.2810	4,021,438.8574
			409,784.0630	4,021,446.5840
D22	0.03	SDCA	414,001.2500	4,020,257.5078
			414,001.4690	4,020,502.5137
			414,426.0000	4,020,500.8262
			414,464.0310	4,020,432.0313
			414,293.7190	4,020,338.7207
			414,135.9690	4,020,279.6660
			414,001.2500	4,020,257.5078
D23	0.29	SDCA	409,535.8130	4,018,994.6445
			409,534.9380	4,019,112.7676
			409,493.8750	4,019,250.0898
			409,428.5630	4,019,253.1973
			409,374.7500	4,019,259.9512
			409,200.4380	4,019,355.6914
			409,208.0310	4,019,472.8008
			409,435.7810	4,019,902.2852
			409,445.4060	4,019,983.3887
			409,576.6880	4,020,126.1250
			410,016.9060	4,020,278.1445
			410,025.1560	4,019,002.0527
			409,535.8130	4,018,994.6445

Area ID	Area (miles)	Area type	Coordinates(UTM Zone11 meters NAD83) X-coordinates	Y-coordinates
S1	0.71	Study	410001.6560	4042464.2656
			409290.7190	4042500.2383
			408861.2190	4042688.4688
			408813.8750	4042910.9609
			408859.4380	4043071.8984
			408972.0940	4043285.6914
			409337.5310	4043461.0000
			410500.6560	4043924.3945
			410962.4690	4044000.3555
			411096.8440	4043852.2109
			411108.0630	4043672.6836
			410984.4380	4043481.0273
			410592.0940	4043294.9219
			410496.6250	4043013.0352
			410003.5310	4043008.3594
			410001.6560	4042464.2656
S2	0.27	Study	415072.8130	4041278.8984
			414928.6560	4041572.7422
			414740.2500	4042529.6992
			415304.2190	4042966.9609
			415642.3130	4042393.3203
			415234.1250	4041986.6914
			415072.8130	4041278.8984
S3	0.72	Study	421548.9690	4029833.7383
			421571.8750	4030077.3184
			421631.0310	4031208.7773
			421439.0940	4031498.2363
			421216.1560	4031761.8594
			421260.3750	4031837.4414
			421371.5310	4031985.9238
			421398.8440	4032023.9863
			421454.5000	4032099.1406
			421509.5310	4032174.3066
			421645.9690	4032358.6465
			421725.3130	4032466.9844
			421769.8440	4032526.2539
			421827.1560	4032498.3555
			421952.1880	4032442.4199
			421854.9690	4031871.4102
			422105.2500	4031749.0176
			422299.6560	4031762.5020
			422592.2190	4031994.7988
			422701.7500	4032367.5195
			422732.5630	4032243.8984
			422746.8130	4032159.0254
			422779.7500	4032064.7734
			422779.7190	4031946.8984
			422793.9060	4031814.8984
			422817.5310	4031682.9316
			422840.9690	4031565.0645
			422869.3130	4031447.2109
			422836.2810	4031338.7852
			422713.7500	4031206.8086
			422529.9380	4030985.2422
			422250.5940	4030779.7578
			422000.0310	4030499.9922
			422006.2810	4030500.0156
			421836.9380	4030271.0234
			421548.9690	4029833.7383
S4	0.15	Study	417410.5630	4023845.5176
			417398.8440	4023845.8750
			417387.4380	4023846.9883
			417377.4060	4023848.7207
			417367.8440	4023851.0527
			417358.9380	4023853.9434
			417350.9380	4023857.4238
			417343.0940	4023861.6250
			417335.2810	4023866.7793
			417327.4690	4023872.8066
			417319.6880	4023879.7500
			417310.5940	4023888.9688
			417301.9690	4023899.1680
			417293.6560	4023910.1230
			417286.2810	4023921.5137
			417281.1250	4023930.3848
			417276.9060	4023939.6543
			417273.1560	4023949.9414
			417269.7190	4023961.3281
			417266.5000	4023975.5664
			417263.6560	4023992.3125

EXHIBIT 2 -- Owens Lake 2006 Supplemental Dust Control Area Coordinate Descriptions

Area ID	Area (miles)	Area type	Coordinates(UTM Zone11 meters NAD83) X-coordinates	Y-coordinates
S4 continued	0.15	Study	417,257.5630	4,024,036.4043
			417,255.7810	4,024,053.0898
			417,254.3440	4,024,071.4844
			417,253.3440	4,024,112.0410
			417,253.6880	4,024,135.3887
			417,256.4690	4,024,211.2207
			417,258.9380	4,024,248.6602
			417,260.8130	4,024,266.7930
			417,266.0630	4,024,299.1426
			417,269.5630	4,024,313.8516
			417,274.6560	4,024,330.5859
			417,281.5940	4,024,349.5684
			417,289.7810	4,024,368.9414
			417,298.0630	4,024,386.4863
			417,306.2810	4,024,401.4785
			417,314.9690	4,024,415.0508
			417,324.0630	4,024,427.2441
			417,333.2500	4,024,437.8730
			417,341.8130	4,024,446.3809
			417,362.2810	4,024,463.6328
			417,374.6880	4,024,472.7871
			417,391.6880	4,024,484.4727
			417,422.5940	4,024,504.8984
			417,438.9380	4,024,515.1504
			417,454.8440	4,024,524.5742
			417,469.5000	4,024,532.6895
			417,483.8130	4,024,540.1250
			417,497.9690	4,024,546.9180
			417,525.0310	4,024,558.3184
			417,537.3130	4,024,562.7500
			417,550.9690	4,024,567.0371
			417,565.6880	4,024,571.1504
			417,595.7190	4,024,578.3379
			417,644.3750	4,024,588.4512
			417,671.1560	4,024,593.2676
			417,699.5630	4,024,597.4395
			417,729.9690	4,024,601.0371
			417,763.4060	4,024,604.2285
			417,801.4380	4,024,607.2109
			417,876.5000	4,024,612.3184
			417,885.9690	4,024,613.4160
			417,906.1880	4,024,617.6074
			417,954.9060	4,024,630.4629
			417,966.3750	4,024,632.8535
			417,976.4690	4,024,634.2813
			417,984.4060	4,024,634.8398
			417,991.7190	4,024,634.7266
			417,998.0940	4,024,633.9082
			418,004.0310	4,024,632.4531
			418,009.1560	4,024,630.2891
			418,013.8130	4,024,627.4102
			418,017.8750	4,024,623.8594
			418,021.4380	4,024,619.5566
			418,027.1560	4,024,609.7598
			418,032.4060	4,024,597.6895
			418,034.6560	4,024,589.4512
			418,035.8750	4,024,580.7773
			418,035.6560	4,024,570.7617
			418,034.0630	4,024,559.9766
			418,031.0630	4,024,548.3418
			418,026.3750	4,024,535.4473
			418,020.4690	4,024,521.3984
			418,000.5310	4,024,478.6465
			417,984.5630	4,024,435.9668
			417,970.9060	4,024,402.7227
			417,957.8130	4,024,373.8125
			417,943.3130	4,024,343.8242
			417,931.2500	4,024,320.3027
			417,918.0940	4,024,295.7734
			417,880.1250	4,024,228.6719
			417,859.5000	4,024,190.0117
			417,854.1250	4,024,181.0176
			417,848.9380	4,024,173.2773
			417,843.6250	4,024,166.4160
			417,838.3130	4,024,160.3535
			417,832.0940	4,024,154.4258
			417,825.1250	4,024,149.1992
			417,816.9690	4,024,144.4160
			417,807.5630	4,024,140.0762
			417,799.1250	4,024,136.8242
			417,789.4690	4,024,133.5957
			417,744.3750	4,024,120.6641
			417,733.3130	4,024,116.6641

Area ID	Area (miles)	Area type	Coordinates(UTM Zone11 meters NAD83) X-coordinates	Y-coordinates
S4 continued	0.15	Study	417723.6250	4024112.4082
			417716.8440	4024108.7773
			417710.6880	4024104.8281
			417693.1880	4024092.0859
			417683.1250	4024084.1797
			417674.4380	4024076.5137
			417667.2810	4024069.1191
			417661.4690	4024061.8086
			417657.0630	4024054.5488
			417654.5000	4024048.2773
			417652.5000	4024040.8516
			417647.9060	4024009.5918
			417646.3750	4024002.8047
			417644.5940	4023996.9746
			417640.7500	4023988.9395
			417636.0310	4023980.8086
			417630.3750	4023972.9629
			417623.6560	4023965.2930
			417617.2810	4023958.7949
			417609.9690	4023952.3184
			417601.7810	4023945.7832
			417592.6250	4023939.0781
			417575.3440	4023927.6641
			417540.5940	4023906.3262
			417526.8440	4023897.4316
			417515.0940	4023889.3320
			417487.6880	4023868.7949
			417472.0940	4023858.9844
			417463.6560	4023854.8926
			417455.1880	4023851.9063
			417444.7810	4023849.1504
			417433.6250	4023847.1348
			417422.1560	4023845.9258
			417410.5630	4023845.5176
C1	0.21	Channel	411145.9380	4022140.5117
			410989.3130	4022252.0020
			410994.2500	4022416.6367
			411126.7810	4022795.5957
			411582.4060	4023006.9551
			411784.7500	4023306.3613
			411867.2500	4023463.2520
			411737.1560	4023825.0313
			411915.1560	4023883.7793
			411983.4060	4023714.6152
			412117.6560	4023538.0977
			411792.0630	4023094.1152
			411782.4060	4023076.2949
			411748.7190	4022994.3965
			411643.6250	4022726.7266
			411641.6880	4022435.3887
			411419.2190	4022347.2383
			411284.5000	4022318.9453
			411145.9380	4022140.5117
C2	0.30	Channel	409201.5000	4019370.5664
			409173.3130	4019532.8418
			409115.7190	4019657.4395
			409058.5940	4019813.5703
			409055.4380	4019859.0117
			409098.6560	4019944.7520
			409192.5940	4020079.2344
			409223.5310	4020182.5996
			409280.3750	4020086.8984
			409276.4690	4020023.0879
			409352.7190	4020011.6758
			409373.6560	4020006.3652
			409409.3130	4020065.3262
			409487.8750	4020143.3594
			409998.1880	4020801.4746
			410027.7500	4021036.2715
			410109.2810	4021484.2578
			410174.2810	4021494.7188
			410242.0940	4021502.6836
			410335.4060	4021518.5000
			410438.7190	4021533.8438
			410529.8750	4021556.1816
			410712.0940	4021583.1074
			410602.7500	4021411.3418
			410686.8440	4021328.9805
			410488.7190	4020946.7344
			410264.6250	4020620.0820
			410015.6880	4020454.4902

EXHIBIT 2 -- Owens Lake 2006 Supplemental Dust Control Area Coordinate Descriptions

Area ID	Area (miles)	Area type	Coordinates(UTM Zone11 meters NAD83) X-coordinates	Y-coordinates
C2 continued	0.30	Channel	410,016.9060	4,020,278.1445
			409,576.6880	4,020,126.1250
			409,445.4060	4,019,983.3887
			409,435.7810	4,019,902.2852
			409,208.0310	4,019,472.8008
			409,201.5000	4,019,370.5664

Area ID	Area (miles)	Area type	Coordinates(UTM Zone11 meters NAD83) X-coordinates	Y-coordinates

Total SDCA	12.77
Total Study	1.85
Total Channel	0.50

EXHIBIT 3 -- DUST CONTROL MEASURE MAP

Shown are dust control measures assigned to areas within the SDCA.

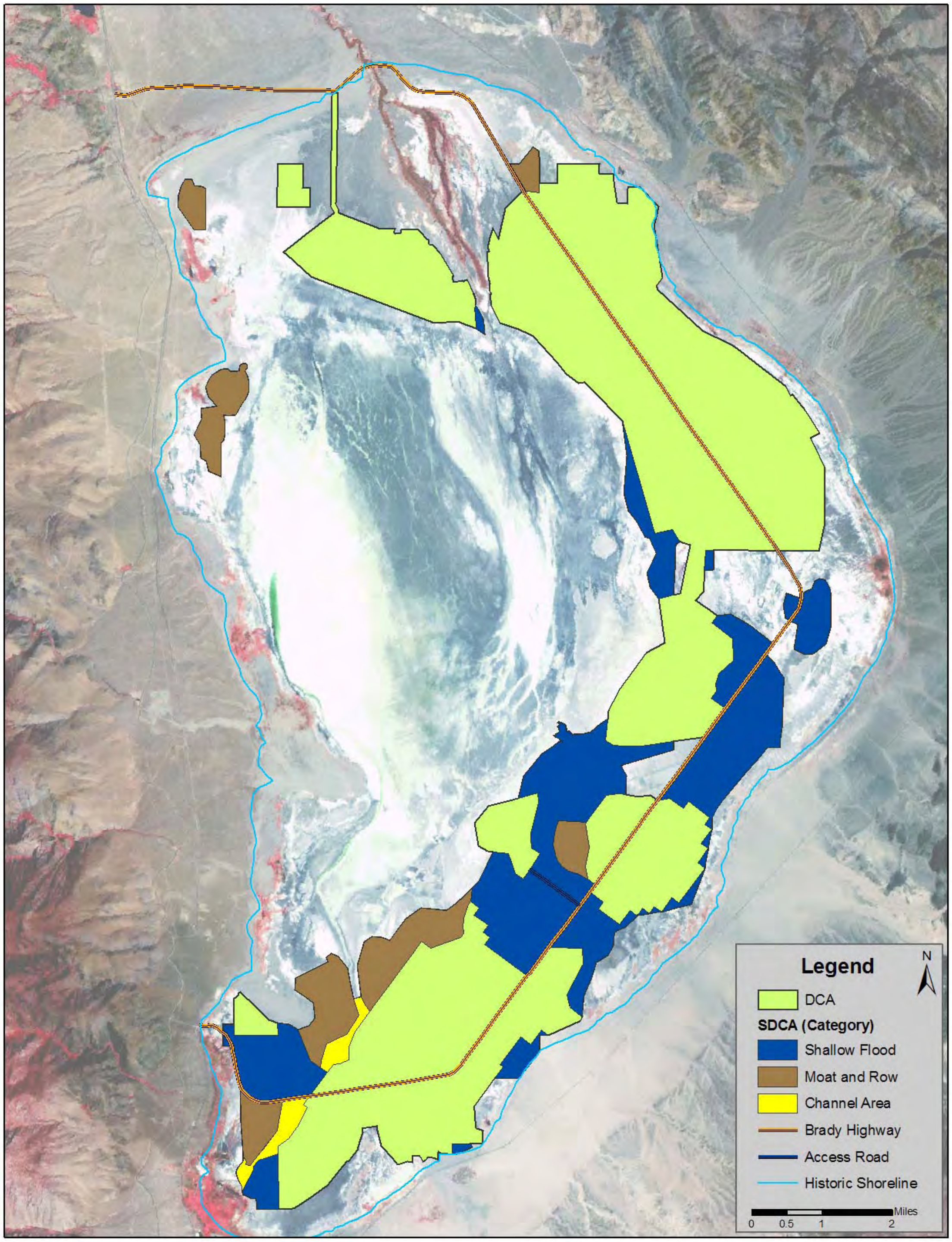


EXHIBIT 4 -- DUST CONTROL MEASURE DESCRIPTIONS

Brief descriptions of dust control measures for use on Owens Lake are given below. More detailed descriptions of the three BACM approved dust control methods (shallow flooding, managed vegetation and gravel) are provided in the 2003 SIP. Modifications to these measures as provided in the Settlement Agreement (Agreement) are noted. All references are to sections of the Agreement; section numbers of the Agreement are contained in square brackets.

Shallow Flooding

The "shallow flooding" (SF) dust control measure involves wetting emissive lake bed surfaces to reduce dust emissions. Performance specifications and a detailed description of the SF measure are provided in the 2003 SIP for achieving 99 percent PM_{10} control efficiency. Otherwise, water shall be applied in amounts sufficient to achieve the required wetness cover as specified in Sections 3 through 5, 25, 26, and 27, or as modified under the provisions of Sections 5, 14, 15, 18, and 29. Satellite imagery, aerial photography or other methods approved by the APCO under the provisions of Section 29 are used to measure wetness cover for compliance.

Managed Vegetation

The "managed vegetation" (MV) dust control measure involves establishing a plant cover on emissive lake bed surfaces to protect them from the wind, thereby reducing dust emissions. Performance specifications and a detailed description of the MV control measure are provided in the 2003 SIP for achieving 99 percent PM_{10} control efficiency. Vegetative cover on the MV site present on the lake bed on January 1, 2007 shall be as specified in Section 6. The performance specification of MV may be modified under the provisions of Section 29. Point-frame measurements satellite imagery or other methods approved by the APCO under the provisions of Section 29 are used to measure plant cover for compliance.

Gravel Cover

The "gravel cover" (GC) dust control measure involves placing a layer of gravel on emissive lake bed surfaces to protect them from the wind, thereby reducing dust emissions. Performance specifications are described in the 2003 SIP.

Moat and Row

The general form of the "moat and row" (MR) measure is an array (see Figure E4-1) of earthen berms (rows) about 5 feet high with sloping sides, flanked on either side by ditches (moats) about 4 feet deep (see Figure E4-2). Moats serve to capture moving soil particles, and rows physically shelter the downwind lake bed from the wind. The individual MR elements are constructed in a serpentine layout across the lake bed surface, generally parallel to one another, and spaced at variable intervals, so as to minimize the fetch between rows along the predominant wind directions. The serpentine layout of the MR array is intended to control emissions under the full range of principal wind directions (see Figure E4-1). Initial pre-test modeling indicates that MR elements' spacing will generally vary from 250 to 1000 feet, depending on the surface soil type and the PM_{10} control effectiveness required on the MR area.

The PM_{10} control effectiveness of MR may be enhanced by combining it with other dust control methods such as vegetation, water, gravel, sand fences, or the addition of other features that enhance sand capture and sheltering or directly protect the lake bed surface from wind erosion. The effectiveness of the array can also be increased by adding moats and rows to the array, which reduces the distance between rows.

The final form of MR will largely be determined from the results of testing on the lake bed as provided in Sections 7 and 8. Final design is subject to test results, required PM_{10} control effectiveness, environmental documentation and permitting, engineering, and monitoring considerations.

In areas where MR is used as a control measure, the City shall implement the measure in a manner consistent with the Agreement, particularly Sections 7 and 8, or as modified by actions pursuant to Sections 18 through 24.

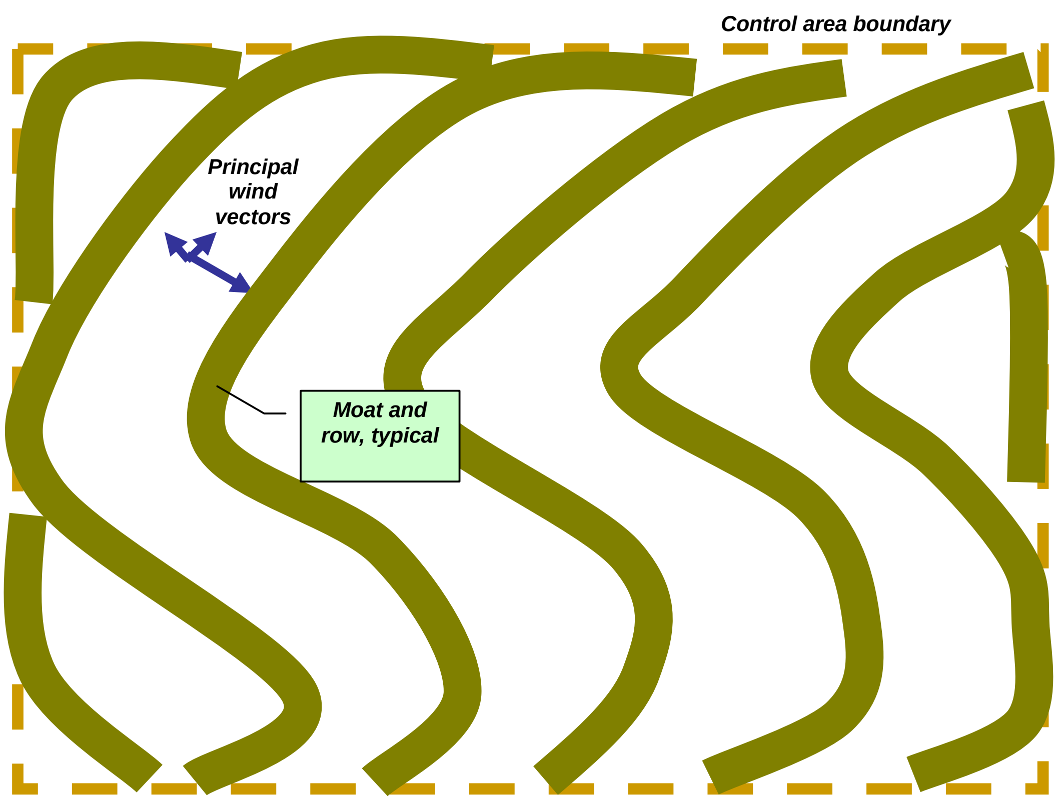


Figure E4-1. Moat and Row Array Plan View (schematic).

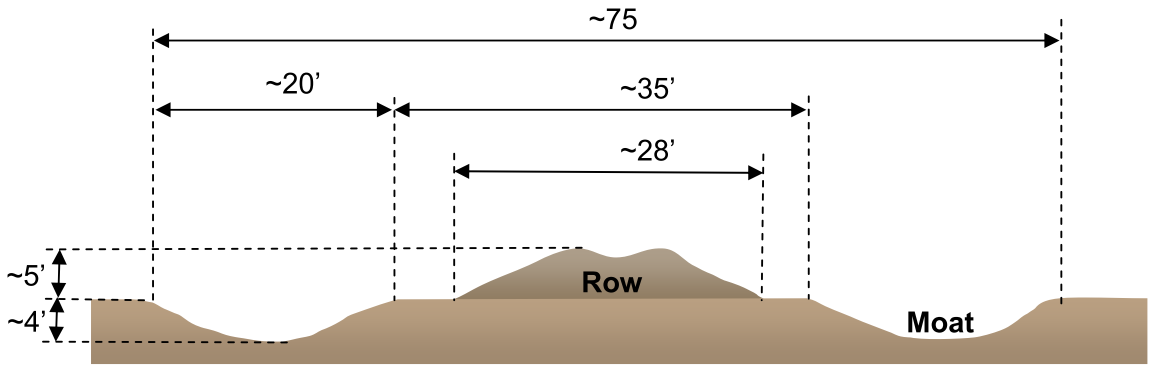


Figure E4-2. Profile of Moat and Row with Approximate Dimensions (schematic).

EXHIBIT 5 -- TDCA MINIMUM DUST CONTROL EFFICIENCY MAP

Shown are MDCEs calculated according to Sections 3 and 4 of the agreement.

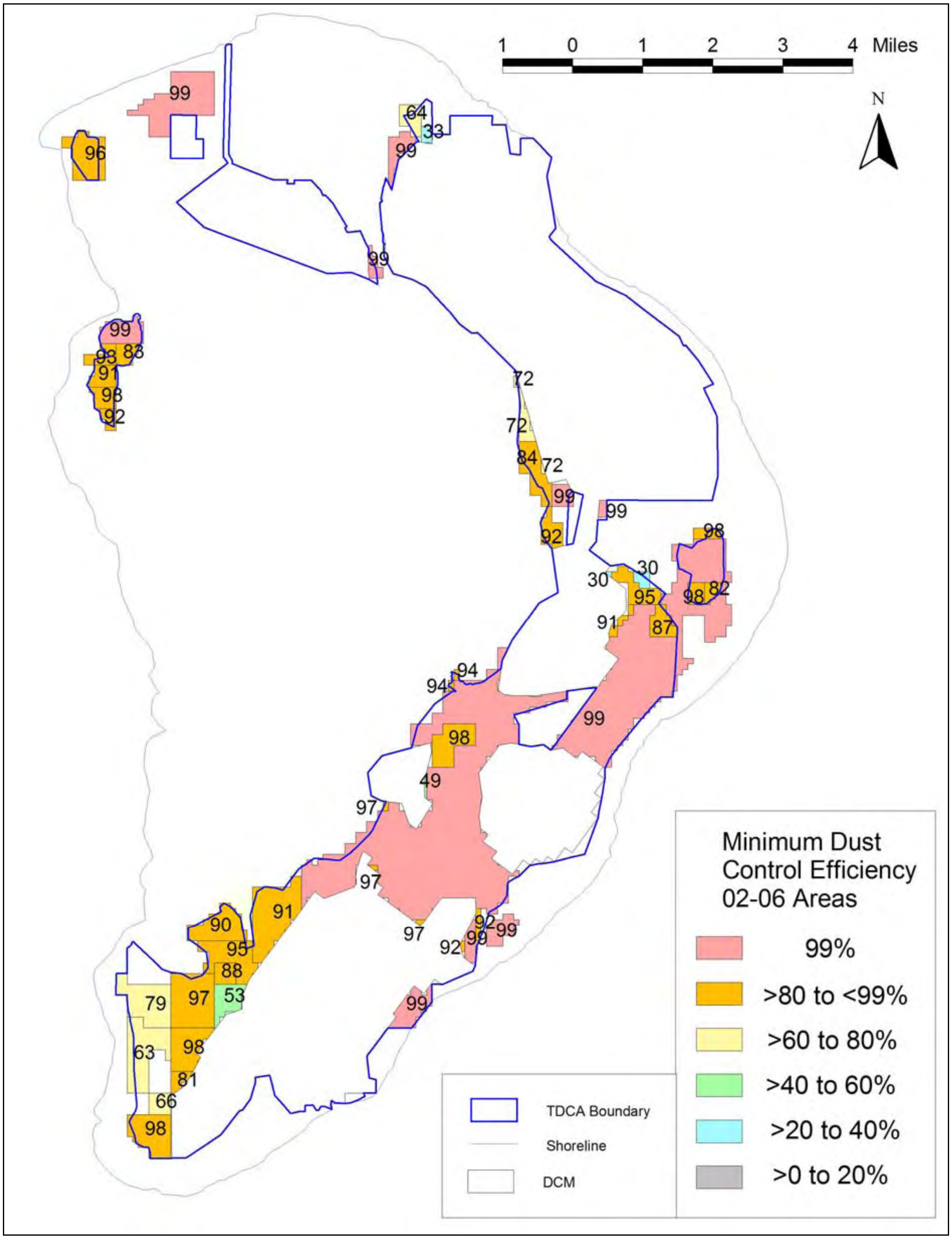


EXHIBIT 6 -- MDCE SELECTION PROCESS

This exhibit summarizes the purpose of the MDCE Selection Process Spreadsheet. A copy of the Process Spreadsheet, which contains a description of the spreadsheet structure and operation, may be downloaded from the District's website at http://www.gbuapcd.org/.

The District developed the Dust ID Model as a tool for identifying dust control areas on the lake bed. The Dust ID Model computes the amount of dust being generated from each source area on the lake bed, but the results cannot be used without additional processing to identify the acceptable combinations of dust control required on each source area (that is, each area's minimum dust control efficiency or "MDCE") to achieve the federal 24-hour PM_{10} standard along the shoreline. There are many possible combinations of MDCEs that could produce the acceptable result of achieving the standard at the shoreline. For example, 50 percent control on hypothetical Area 1 and 99 percent control on Area 2 may produce the same modeled shoreline concentration as 99 percent control on Area 1 and 50 percent control on Area 2. However, the first combination might be more practical and less costly than the second, and for that reason it is important to have a process that can quickly and efficiently identify acceptable combinations. In all cases, the outcome of this process is some combination of area-by-area dust control efficiencies that produces a modeled attainment of the federal PM_{10} standard everywhere along the shoreline.

The process for selecting the acceptable combinations of dust control levels has been, heretofore, a manual process. The MDCE Selection Process Spreadsheet (Process Spreadsheet) was developed to more quickly and efficiently identify combinations of dust controls required to produce compliance with the federal 24-hour PM_{10} standard along the shoreline. The worksheet is set up so that MDCE calculations are automatic, yet it still allows manual adjustments to be made.

EXHIBIT 7 -- SHALLOW FLOOD CONTROL EFFICIENCY CURVE

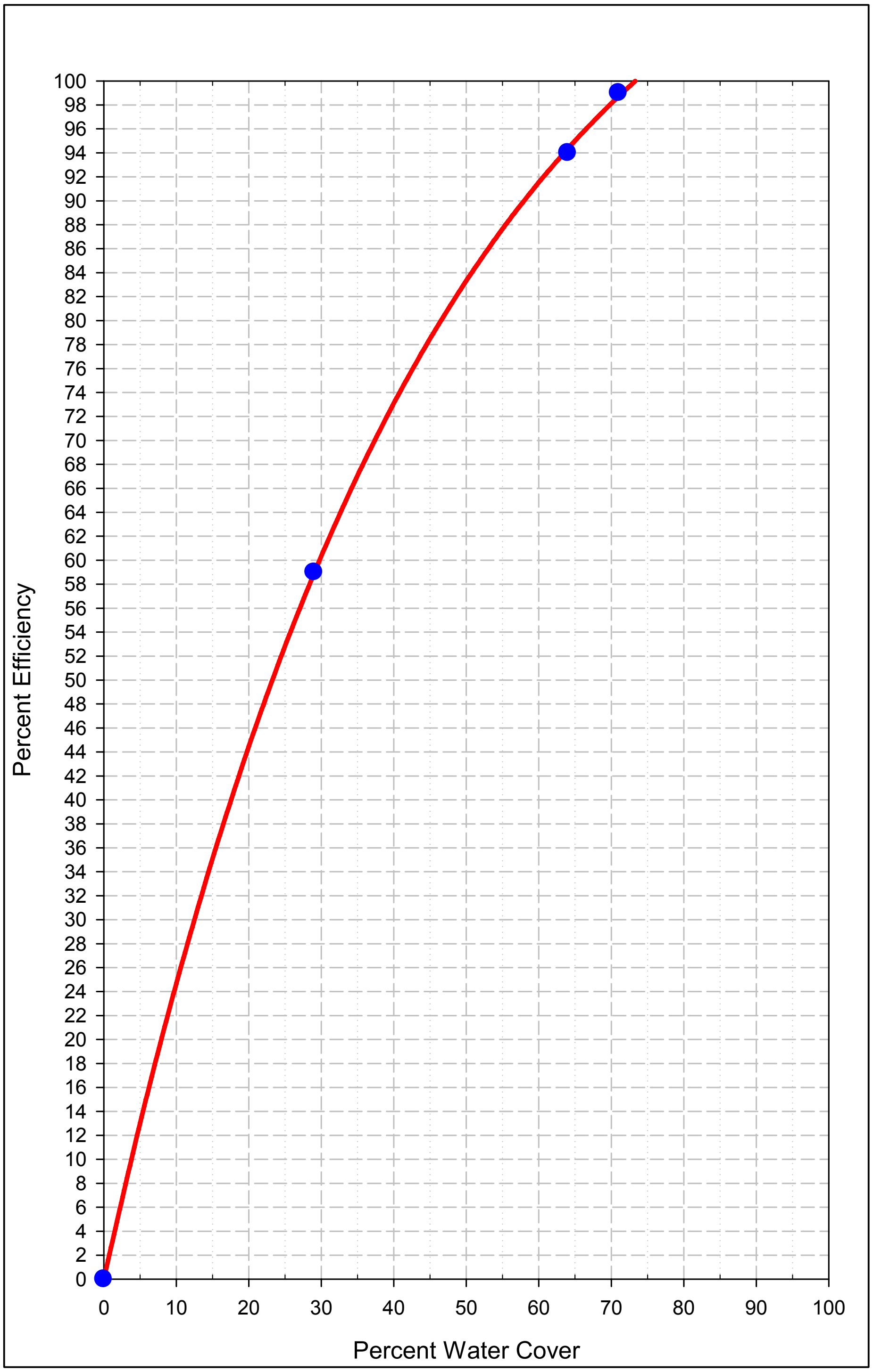


EXHIBIT 8 -- MOAT AND ROW DEMONSTRATION PROJECT LOCATION MAP

Two proposed moat and row demonstration project locations

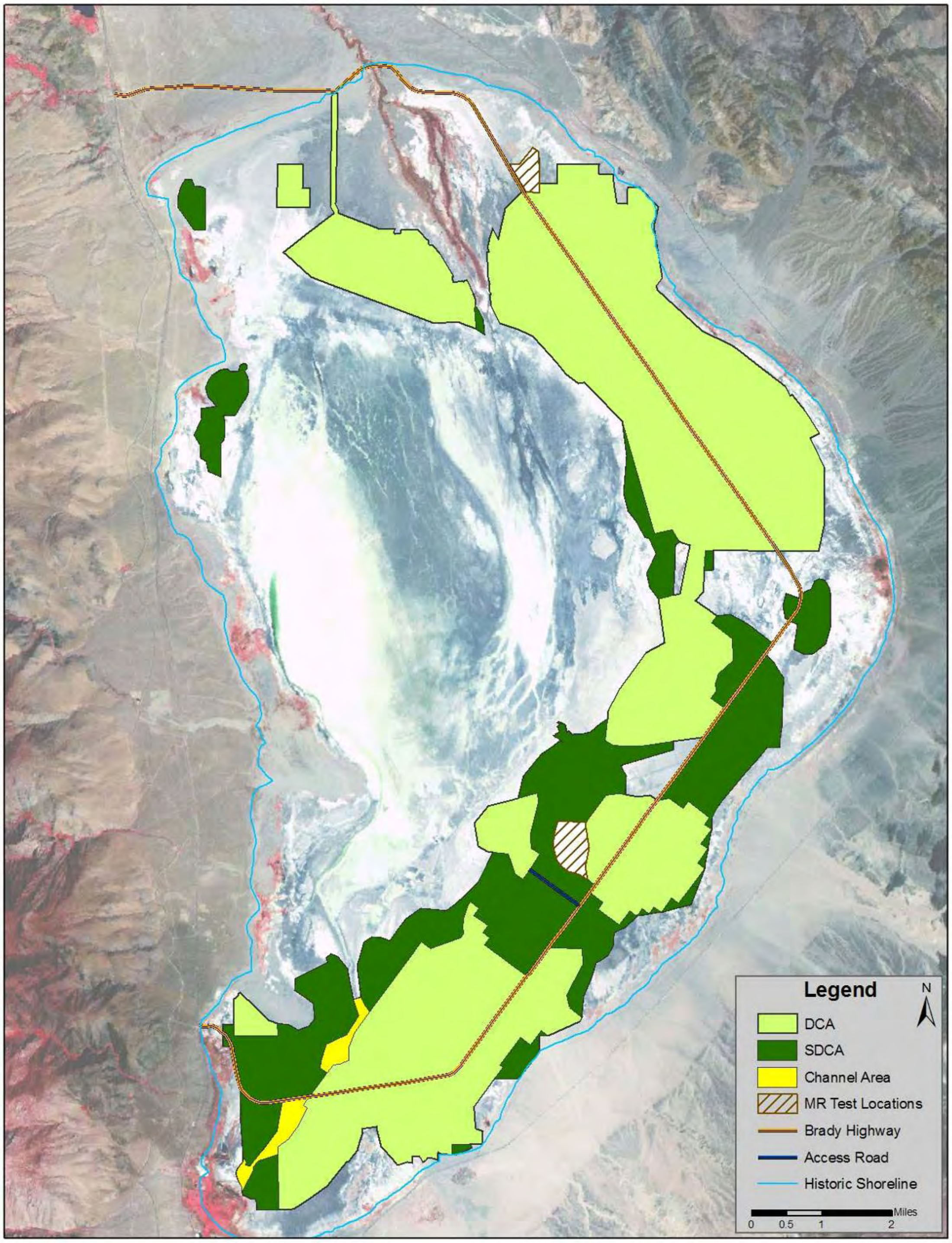


EXHIBIT 9 -- STUDY AREA MAP

Four proposed study area locations

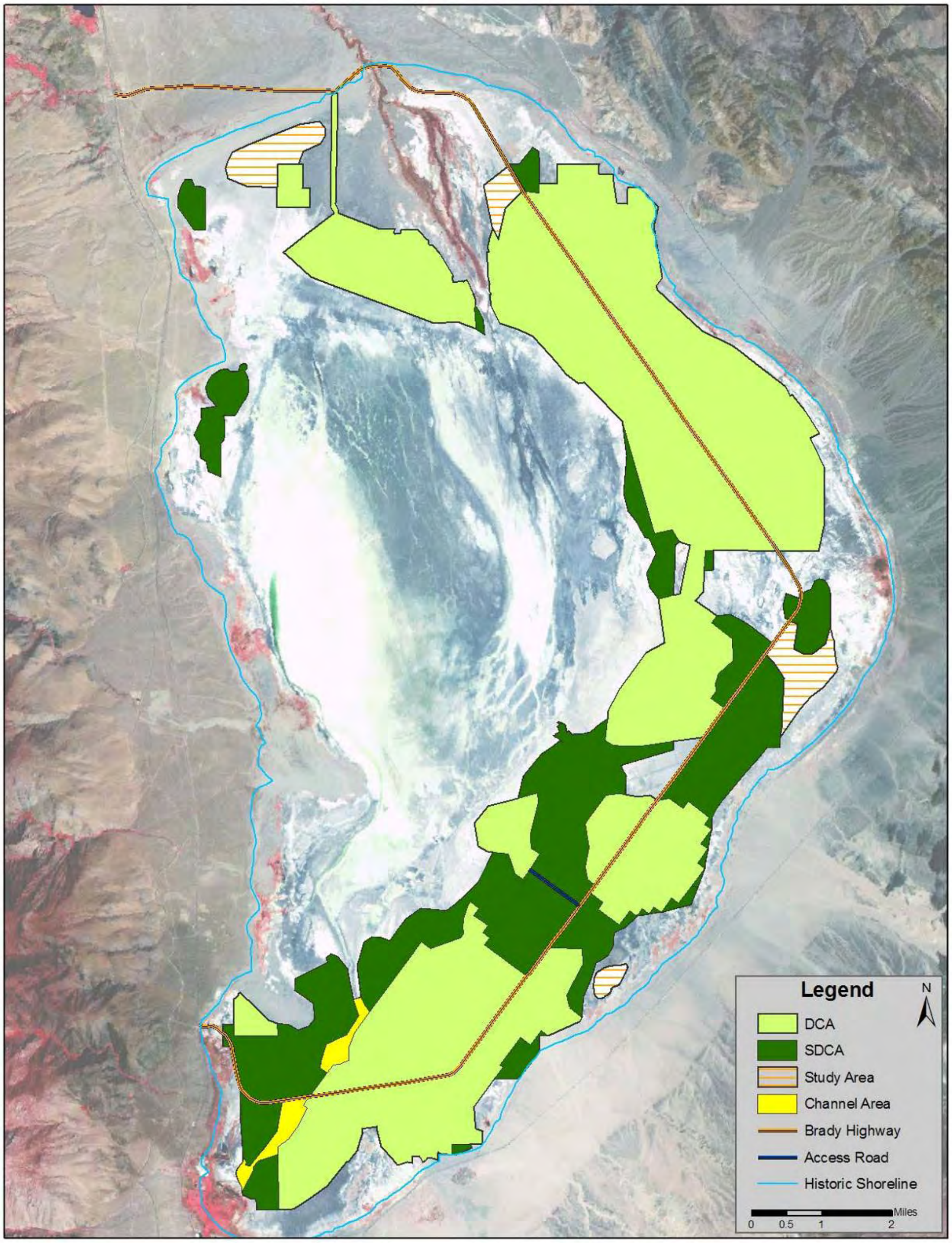


EXHIBIT 10 -- SCHEDULE OF CONTINGENCY MEASURES

Issue	Resolution	Duration	Units
Moat and Row			
Eroded row	Install armoring to prevent further erosion	2	mo/mile
	Install sand fences to prevent further erosion	1	mo/mile
	Reconstruct row in place or adjacent	2	mo/mile
Filled moat	Re-excavate new moat outboard of filled moat, expand existing row onto filled moat	2	mo/mile
Filled sand fence	Clean out or flank with new sand fences	2	mo/mile
Collapsed sand fence	Repair or flank with new sand fences	1	mo/mile
Spacing too large	Pull in intervening sand fence	1	mo/mile
	Add intervening moat and row	3	mo/mile
	Enhance with vegetation and/or wetness	12 to 36	months
	Soil roughening	1 to 3	months/sq mi
	Conversion to reduced BACM/BACM	See Exhibit 11	
Managed Vegetation			
Emissions from bare areas	Enhance/restore vegetation	36	months
	Stabilize by other means (e.g., moisture, sand fences)	1 to 6	months/sq mi
Emissions from vegetated areas	Determine and establish necessary cover	36	months
	Stabilize by other means (e.g., moisture, sand fences)	1 to 6	months/sq mi
Gravel Patches			
Infilling pore spaces	Supplement gravel depth	4	months/sq mi
	Stabilize by other means (e.g., vegetation, wetness, sand fences)	6 to 36	months
Shallow Flood			
Emissions from dry areas (insufficient uniformity of wetting)	Wet dry areas. May require land leveling and/or additional laterals.	12	months
Generally too dry	Increase water application rate relative to ET	1	month
Other features			
Gravel source	Open new or re-open existing quarry	4	months
Emissions from roads, berms, etc.	Increase watering frequency	1	month
	Stabilize by other means (e.g., gravel, stabilizing agents)	1 to 4	months/sq mi

EXHIBIT 11 -- MOAT AND ROW TRANSITION SCHEDULE

Activity	Duration (years)
Shallow flood transition from moat & row	1.9
Managed vegetation transition from moat & row	5.9
Gravel cover transition from moat & row	1.8
Mutually agreeable exceptions:	*Increase over and above durations listed above (years)*
1. Mainline capacity increase	2.1
2. New aqueduct turnout	1.4
3. New power feed	1.0

EXHIBIT 12 -- DCM OPERATION SCHEDULE

Activity	Duration (years)
New area shallow flood DCM[a]	2.9
New area managed vegetation DCM[a]	6.1
New area gravel cover DCM[a]	2.2
Mutually agreeable exceptions:	*Increase over and above durations listed above (years)*
1. Mainline capacity increase	2.1
2. New aqueduct turnout	1.4
3. New power feed	1.0
4. Expanded CEQA triggered	1.4
[a]Assumes that total new area <2 square miles per year	

EXHIBIT 13. DEFINITIONS

A. "Background PM_{10} concentration" shall mean the concentration of PM_{10} caused by sources other than from wind blown dust emanating from the Owens Lake bed. For the purpose of modeling air quality impacts, the background concentration is assumed to be 20 $\mu g/m^3$ (micrograms per cubic meter) during every hour at all receptor locations. The monitored and modeled PM_{10} emissions from the Keeler Dunes, which are located off the lake bed are treated as a separate dust source area and are not included in the background concentration.

B. "Best Available Control Measures" or "BACM" shall have the same definition as in the federal Clean Air Act. Approved BACM in the 2003 SIP was associated with PM_{10} emission reductions of at least 99 percent and includes managed vegetation, shallow flood, and gravel cover.

C. "Contingency measures" shall mean dust control measures or modifications to the dust control measures that can be implemented to mitigate dust source areas that cause or contribute to an exceedance of the federal standard at the historic shoreline in the event that a previously approved control strategy was found to be insufficient.

D. "Control Area" shall mean an area on the lake bed for which dust control is required.

E. "Control efficiency" shall mean the relative reduction or percent reduction in PM_{10} emissions resulting from the implementation of a control measure compared to the uncontrolled emissions.

F. "Control measures" shall mean measures effective in reducing the PM_{10} emissions from the lakebed surface over which they are implemented.

G. "Dust control measure" or "DCM" shall mean measures designed to suppress sand motion and reduce dust emissions from the Owens Lake bed.

H. "Dust ID Model" shall mean a computer-based air quality modeling approach developed as part of the 2003 SIP to identify emissive areas on the Owens Lake bed and to estimate the resulting PM_{10} concentrations at the shoreline. See also "Dust ID Program."

I. "Dust ID Program" shall mean a long-term monitoring and modeling program that is used to identify dust source areas at Owens Lake that cause or contribute to exceedances and violations of the federal PM_{10} standard. The current protocol for conducting the Dust ID Program is included in the 2003 SIP (Exhibit 2 – Attachment 4). See also “Dust ID Model.”

J. “Emission rate” shall mean the rate (expressed as mass per unit area per unit time) at which an air constituent (PM_{10}, for example) is transported away from the surface of the lake bed.

K. “Exceedance of the federal standard” or “exceedance” shall mean any single-day PM_{10} concentration that is monitored or modeled to be above 150 $\mu g/m^3$ (24-hour average from midnight to midnight) at any location at or above the historic shoreline.

L. “Historic shoreline” or “shoreline” shall mean the elevation contour line of 3,600 feet above mean sea level at Owens Lake, California.

M. “Lake bed” or “Owens Lake bed” or “playa” shall mean the exposed surface within and below the historic shoreline.

N. “Managed Vegetation” is a Dust Control Measure consisting of lakebed surfaces planted with protective vegetation.

O. “May not lawfully be included in the SIP” shall mean that inclusion of the provision in question in the revisions to the 2003 SIP has been determined by binding judicial order to be unlawful.

P. “MCDE-BACM” shall mean Dust Control Measures that achieve Minimum Dust Control Efficiency and are found to be appropriate for the area of application.

Q. “Minimum Dust Control Efficiency” or “MDCE” shall mean the lowest dust control efficiency, as determined by the Dust ID model, in the Supplemental Dust Control Area necessary to meet the federal standard at the historic shoreline.

R. “Moat and Row” shall mean a Dust Control Measure consisting of arrays of sand breaks that arrest sand motion.

S. “PM_{10}” or “particulate matter” shall mean atmospheric particulate matter less than 10 micrometers in nominal aerodynamic diameter.

T. “PM_{10} monitor” shall mean an instrument used to detect the concentrations of PM_{10} in the air.

U. “Sand flux monitor” shall mean a device used to measure the amount and/or rate of moving or saltating sand and sand-sized particles caused by wind erosion.

V. "Shallow Flood" is a Dust Control Measure consisting of lakebed areas wetted to a specified proportion of surface coverage.

W. "2003 SIP" or "2003 Owens Valley PM_{10} State Implementation Plan" shall mean the Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan 2003 Revision – Adopted November 13, 2003.

X. "Supplemental Control Requirements" or "SCR" shall mean Dust Control Measures required by the District on areas outside of the DCA that cause or contribute to an exceedance of the federal PM_{10} standard at the historic shoreline of Owens Lake.

Board Order 080128-01
Attachment B

2008 Owens Valley Planning Area
Supplemental Control Requirements Determination Procedure

BACKGROUND

The State Implementation Plan (SIP) adopted by the Great Basin Unified Air Pollution Control District (District) in 2003 required the City of Los Angeles (City) to install and operate PM_{10} controls on a total of 29.8 square miles of the dried Owens Lake bed by the end of 2006. The 2003 SIP also contained a provision and procedures for an annual review of air quality monitoring data by the District's Air Pollution Control Officer (APCO) in order to determine if controls were needed on additional areas beyond the 29.8 square miles in order for the Owens Valley Planning Area to attain or maintain the federal 24-hour PM_{10} National Ambient Air Quality Standard (NAAQS). If additional controls were needed, the 2003 SIP provided for the APCO to require the City to implement the necessary controls. This annual review and possible requirement for additional controls is known as the Supplemental Control Requirements (SCR) determination. The 2003 SIP required that SCR determinations use data collected starting July 1, 2002.

In December 2005, after analyzing data collected from July 2002 through June 2004, the District's APCO made the first SCR determination under the provisions of the 2003 SIP. The City objected to the APCO's analysis and submitted an alternative analysis of the data. After reviewing the City's analysis, the APCO revised the SCR determination in April 2006. The City also objected to the revised determination and filed a lawsuit against the District in May 2006. In June 2006 the City and the District entered into settlement negotiations in an attempt to resolve their disputes.

In December 2006 a final Settlement Agreement was approved by the District and the City. This agreement is Attachment A to Board Order 080128-01. Among other issues, the Settlement Agreement provides for modifications to be made to the 2003 SIP's SCR determination procedure. These modifications are incorporated into this revised 2008 SCR determination procedure.

CONDITIONS

The 2008 Owens Lake Dust Source Identification Program Protocol (Protocol) (Attachment C) contains the procedures to collect, screen, analyze and model the data used by the District's APCO to determine if exceedances of the 24-hour PM_{10} NAAQS have occurred and additional Supplemental Controls are necessary on the Owens Lake bed. The following actions may be taken by the APCO and will not be considered a change to the Protocol:

- Add, remove or move PM_{10} monitors and meteorological stations
- Replace TEOMs with any other USEPA-approved Reference or Equivalent Method monitors that collect hourly concentration data
- Replace Sensits with any other sand flux monitor (SFM) that collects hourly data
- Replace Cox Sand Catchers with any other SFM

- Add, remove or move SFMs as long as the maximum grid cell size for modeling remains at one square kilometer
- Calculate "from-the-lake" wind directions for new PM_{10} monitor sites
- Determine default K-factors for new source areas

The Protocol and these Supplemental Control Requirements (SCR) specify many assumptions and decision trees to be followed that may need to be changed in the future. The following changes to the Protocol and the SCR may be made by written agreement of the APCO and the General Manager of the City of Los Angeles (City) Department of Water and Power:

- The background value of 20 $\mu g/m^3$ may be changed to another value or a procedure may be established to calculate the background from upwind/downwind lake bed monitors
- The default K-factors may be updated
- The default seasonal cut points may be updated
- The CalPUFF modeling system may be changed to another USEPA guideline model
- The procedure for determining the sand flux from a Dust Control Measure (DCM) area may be updated
- The K-factor screening criteria may be updated
- From-the-lake wind directions in Attachment B, Table 1 may be changed to avoid including off-lake sources
- Non-reference or non-equivalent method special purpose PM_{10} monitors may be added
- Procedures for determining source area boundaries may be updated
- Methods for directly measuring source area emission rates may be implemented

DEFINITIONS

A ***shoreline or near-shore*** PM_{10} ***monitor*** is a fixed or portable USEPA-approved Federal Reference Method or Equivalent Method PM_{10} Monitor located approximately on the 3600-foot elevation (historic shoreline) contour, or within the Owens Valley Non-Attainment Area above the 3600-foot elevation. The existing shoreline or near-shore PM_{10} monitors are at Keeler, Flat Rock, Shell Cut, Dirty Socks, Olancha, Bill Stanley and Lone Pine (see Attachment B, Map 1).

A ***special purpose*** PM_{10} ***monitor*** is a fixed or portable USEPA-approved Federal Reference Method or Equivalent Method PM_{10} monitor installed upwind of or near potential dust source areas on the lake bed below the 3600-foot elevation. These lake bed PM_{10} monitors will be used to monitor new dust sources areas to generate new K-factors and to evaluate model predictions at the PM_{10} sites. They shall not be used to monitor compliance with the NAAQS and the data will not be submitted to USEPA's Aerometric Information and Retrieval System (AIRS).

An ***exceedance*** is a midnight to midnight Pacific Standard Time 24-hour average PM_{10} concentration greater than 150 $\mu g/m^3$ measured by a shoreline or near-shore PM_{10} monitor.

From-the-lake wind directions are determined by extending two straight lines from the PM_{10} monitor site to the points on the 3600-foot contour of the Owens Lake bed that maximize the angle in the direction of the lake bed between the two straight lines. From-the-lake and non-lake wind directions for the existing PM_{10} monitor sites are shown in Attachment B, Table 1.

Physical evidence of a source area boundary consists of Global Positioning System (GPS) data, visual observations, photographic observations, video observations, or any other method described for this purpose in the Dust ID Protocol.

BACM are Best Available Control Measures/Most Stringent Measures (MSM) defined as the dust controls determined to be BACM/MSM for Owens Lake in Paragraphs 15, 16 and 17 of Board Order 080128-01. If, in the future, the District changes or deletes existing BACM or adds new BACM, then the dust controls are those as revised by the latest District action.

Implements BACM control measures means BACM are constructed and meeting the performance standards outlined Paragraphs 15, 16 and 17 of Board Order 080128-01.

Extreme violators are areas currently required to implement BACM, but BACM are found to be insufficient to adequately control emissions.

Environmental analysis document complete means that a project level environmental document has been certified covering the location and the BACM/MSM selected for implementation by the City.

GENERAL SCR DETERMINATION PROCEDURE

1. If the City is in compliance with Paragraphs 1 and 3 of Board Order 08128-01 regarding the amount, timing and operation of existing and future dust controls, the APCO will not issue additional written SCR determinations until after May 1, 2010 and will not use data collected prior to April 1, 2010 for new determinations, except for Study Areas as provided in Paragraph 2, below. This will allow the City time to complete construction and implementation of the additional PM_{10} controls within the 2008 Total Dust Control Area.

2. After May 1, 2010, the APCO will recommence written SCR determinations using the latest SCR procedure. Recommenced determinations will use data collected only after April 1, 2010, except in those areas delineated as Study Areas. SCR determinations for Study Areas shall use data collected after July 1, 2006. The APCO shall make SCR determinations at least once in every calendar year. SCR determinations shall make reasonable efforts to account for impacts caused by Dust Control Measure construction activities.

3. If, pursuant to Paragraph 2, herein, the APCO determines that a monitored or modeled exceedance of the federal 24-hour PM_{10} NAAQS caused by emissions from the lake bed has occurred at or above the historic shoreline:

   A. The APCO, based on all available information, including, visual observation, physical evidence, monitoring and modeling, and in consultation with the City, will identify the need for additional controls, monitoring, or both.

      (i) If the APCO identifies the need for additional controls and/or increased MDCE on existing controls, the APCO shall issue a written SCR determination to the City.

(ii) If the City does not agree with the APCO's determination, the City may, within 60 days of the APCO's determination, submit to the District an alternative analysis of the data used by the APCO to make the determination.

(iii) If the City submits an alternative analysis, the APCO shall consider the City's analysis and has full and sole discretion to withdraw, modify or confirm the SCR determination. If the APCO takes action to withdraw or modify the SCR determination, he shall do so within 60 days of the City's submittal of the alternative analysis.

(iv) If the APCO issues a modified SCR determination or confirms the initial SCR determination and the City does not agree with the APCO's action, the City may initiate the Dispute Resolution Process pursuant to Paragraph 32 of the 2006 Settlement Agreement between the District and the City (Attachment A to Board Order 080128-01). The APCO may modify the SCR determination based on the outcome of the Dispute Resolution Process.

(v) In the event the Parties are unable to resolve disagreements over the APCO's SCR determinations through the Dispute Resolution Process, the City may appeal the APCO's SCR determinations to the California Air Resources Board (CARB) under the provisions of Health and Safety Code Section 42316. The CARB will act within 90 days on the City's appeal.

(vi) The implementation of additional control measures under the SCR determination process will be considered contingency measures under Section 172(c)(9) of the federal Clean Air Act and will be implemented automatically upon final action of the SCR determination.

B. The City shall prepare and submit for the APCO's consideration and written approval, which approval shall not be unreasonably withheld, a Remedial Action Plan as described in Paragraph 6 to address the exceedance(s). The City shall submit the Remedial Action Plan within 60 days of the date the SCR determination becomes final.

C. If the City proposes in their Remedial Action Plan to decrease the control efficiency in any previously controlled dust source area, the City must demonstrate that the proposed strategy will control dust sources to the extent that there are no modeled exceedances at the shoreline based on:

(i) new dust event(s) that caused or contributed to a modeled or monitored exceedance,

(ii) dust events that took place from July 2002 through June 2006 based on the results of the MDCE Selection Process Spreadsheet as set forth in the 2006 Settlement Agreement, and

(iii) that previously determined control efficiency levels are maintained in (a) all areas that are required to have 99% control efficiency or higher in the 2003 SIP Dust Control Area and (b) new dust source areas that are not included in the MDCE Selection Process Spreadsheet.

D. The District may, as appropriate, also issue Notices of Violation.

4. In the event:

A. The APCO has made a written determination pursuant to Paragraph 3 that an exceedance of the federal standard, occurring after April 1, 2010, resulted from a Control Area or portion of a Control Area treated with the Moat & Row PM_{10} control measure; and

B. That Control Area or portion of a Control Area causing the exceedance was remediated by the City as provided in Paragraph 6 below; and

C. That Control Area or a portion of that Control Area is subsequently the sole cause of an exceedance of the federal standard at or above the historic shoreline, (i.e., an exceedance occurred after the City's initial attempt to remediate that area under Paragraph 6);

then the City shall convert that Control Area, or that portion of that Control Area, from Moat & Row to MDCE-BACM or BACM as described in Paragraphs 15, 16 and 17 of Board Order 080128-01, to address the exceedance described in Paragraph 4.C., for all or the portion of that Control Area that caused the subsequent exceedance, under the time deadlines provided for in Paragraph 9.

5. If the APCO determines that Moat & Row constitutes BACM or MDCE-BACM as provided for in Attachment D of Board Order 080128-01, "2008 Procedure for Modifying Best Available Control Measures (BACM) for the Owens Valley Planning Area," then upon issuance of such written determination, the provisions of Paragraph 4 that require the City to convert to BACM or MDCE-BACM may be satisfied by applying the BACM or MDCE-BACM approved under this Paragraph 5.

6. A Remedial Action Plan prepared by the City pursuant to Paragraph 3.B will contain a description of:

A. Any and all needed changes, repairs or enhancements to DCMs, including one or some combination of the following:

(i) Maintenance of facilities (*e.g.*, berms, moats and rows);

(ii) Changes to Shallow Flood or Managed Vegetation facilities or operations (*e.g.*, increase in wetness cover extent, improved wetness cover distribution, enhancement of vegetation);

(iii) Augmentation (*e.g.*, more moats and rows) or enhancement (*e.g.*, surface-protecting elements) of Moat & Row areas;

(iv) Transition of Moat & Row areas to BACM, or MDCE-BACM.

B. Any and all needed expansion of DCMs, and specific plans for expanding the measures.

C. A schedule for the work to be performed to implement the changes, clearly indicating the point at which facilities will be operational and effective at design levels.

7. The Schedule of Contingency Measures incorporated as part of this Procedure as Attachment B, Exhibit 1 sets forth a non-exclusive list of items that shall be included by the City in its Remedial Action Plans, described in Paragraph 6, and the timing required for their implementation.

8. Before any full-scale Moat & Row areas are operational, the City shall submit to the District a conceptual design and schedule for possible implementation of BACM or MDCE-BACM to each Moat & Row area consistent with Paragraph 4. These designs and schedules are the potential contingency measures to be implemented by the City where a transition from Moat & Row to another DCM is needed, or where such transition is required pursuant to Paragraph 4.

9. Areas to be transitioned from Moat & Row to BACM or MDCE-BACM will be operational within the times set forth in the Moat & Row Transition Schedule incorporated as Attachment B, Exhibit 2. DCMs for new areas will be operational within the times set forth in the DCM Operation Schedule incorporated as Attachment B, Exhibit 3. In all cases, the time allowed for implementation of control measures shall not include any time between the City's appeal to the California Air Resources Board under the provisions of Health and Safety Code Section 42316 and resolution of such an appeal.

DETAILED SCR DETERMINATION PROCEDURE

Exceedances of the federal 24-hour PM_{10} National Ambient Air Quality Standard of 150 µg/m³ at or above the historic shoreline of Owens Lake (elevation 3600 feet above mean sea level) can either be measured directly via a PM_{10} monitor or they can be modeled using the procedures set forth in the latest Owens Lake Dust Source Identification Program Protocol. Set forth below are the two procedures to be used by the APCO in making SCR determinations: the first uses directly monitored exceedances and the second uses modeled exceedances.

A. MONITORED EXCEEDANCES

A.1 – Do lake bed source areas cause or contribute to a monitored 24-hour average PM_{10} concentration greater than 150 µg/m³ at an historic shoreline PM_{10} monitor or at a near-shore PM_{10} monitor?

Any event that causes a monitored 24-hour average PM_{10} concentration greater than 150 µg/m³ at a shoreline or near-shore PM_{10} monitor will be evaluated to determine if lake bed dust source areas caused or contributed to the exceedance. The following steps will be used to screen hourly PM_{10} concentrations to determine if a lake bed source area caused or contributed to a monitored exceedance:

1) For hourly average from-the-lake wind directions, use the recorded hourly PM_{10} concentration.
2) For hourly average non-lake wind directions or missing data, replace the recorded hourly PM_{10} concentration with the background concentration of 20 µg/m³.

3) Average the adjusted hourly concentrations from steps 1 and 2 for the 24-hour period from midnight to midnight, Pacific Standard Time.

If the 24-hour average of the adjusted hourly PM_{10} concentrations exceeds 150 µg/m³ at the monitor site, go to A.2. If not, go to B.1.

<u>A.2 – Is there physical evidence of lake bed emissions and/or air quality modeling sufficient to define boundaries for the area to be controlled?</u>

<u>Source Delineation.</u>
If possible, the boundary of a dust source area will be delineated by a GPS survey. Under certain circumstances, the surveyed boundary of the dust source area will not result in a closed polygon. If the GPS survey yields a partial boundary and not a closed polygon, then the polygon area may be closed, if the length of the closure is equal to or less than one-half kilometer or is less than 20 percent of the surveyed source area perimeter, whichever is smaller. The ends of the partial surveyed area boundary will be completed with a straight line, unless survey notes or visual observations indicate that a different shaped boundary should be used. If the surveyed source area boundary has a complex shape, then the partial boundary to be closed will use the best available field and visual data to connect the two ends and form the polygon. Boundaries of existing controlled areas or other previously located boundaries will be used in place of a GPS survey boundary, if the survey notes or visual observations indicate the erosion area extends to that boundary.

If the GPS boundary described above is not available, the area will be defined by any one or a combination of GPS surveying, visual observations, and video observations or any other method described in the Dust ID Protocol (Attachment C).

If neither the GPS boundary nor other physical evidence, as described above, is available, the default area size will be one square kilometer centered on the sand flux monitor (SFM), or one grid cell if the SFMs are in a closer array.

If there is physical evidence, as described above, to define the boundaries for the area to be controlled, and no K-factor for that area or no sand catch data above one gram for the sampling period from a sand flux sampler located within a 30 degree upwind cone centered on the wind direction of the defined source, then modeling cannot be performed. Go to A.3.

<u>Modeling.</u>
If sand flux data is available for the exceedance identified in A.1, the District will model the event. Modeling will be performed following the latest Dust ID Modeling Protocol using the source area determined above.

The order of priority for applying K-factors in the model will be:

1) When available, the District will use event specific storm-average K-factors to model dust events at the PM_{10} monitor if there are three or more hours of screened hourly K-factors for a 48-hour period. If not,

2) The District will use the most recent temporal and spatial 75-percentile hourly K-factors to model events, if there are nine or more screened hourly K-factors for a period and they are determined by the methods described in the most current Dust ID Protocol. If not,

3) The District will use the default K-factors in Attachment B, Table 2 to model events, based on the month of the event being investigated and the K-factor area.

Only those on-lake and off-lake dust sources with sand flux data will be included in the model. All data collected by the District pursuant to this Section shall be shared with the City within 30 days of final data review.

The modeling results will be used to prioritize multiple upwind source areas for control, or to determine the fraction of a single upwind source area that needs to be controlled.

Go to A.3

If neither physical evidence nor model results are available, go to A.5.

A.3 – District directs City to implement dust controls.

Source areas in A.2 that cause or contribute to an exceedance may be new source areas, or may be emissions from areas with existing dust controls. The APCO will determine, in writing, that conditions specified in Section A.1 were met for a specified area determined by A.2. For emissions from areas with existing dust controls, the City will have the choice of increasing the controls in the existing dust control areas or controlling other contributing sources that will result in lowering the monitored impact below the 150 $\mu g/m^3$ exceedance threshold, if such areas exist. If the APCO identifies the need for additional controls, the APCO shall issue a written SCR determination to the City.

If the City does not agree with the APCO's determination, the City may, within 60 days of the APCO's determination, submit to the District an alternative analysis of the data used by the APCO to make the determination. If the City submits an alternative analysis, the APCO shall consider the City's analysis and may withdraw, modify or confirm the SCR determination. If the APCO takes action to withdraw or modify the SCR determination, he shall do so within 60 days of the City's submittal of the alternative analysis.

If the APCO issues a modified SCR determination or confirms the initial SCR determination and the City does not agree with the APCO's final action, the City may initiate the Dispute Resolution Process pursuant to Paragraph 32 of the 2006 Settlement Agreement between the District and the City (Attachment A to Board Order 080128-01). The APCO may modify the SCR determination based on the Dispute Resolution Process.

In the event the Parties are unable to resolve disagreements over the APCO's SCR determinations through the Dispute Resolution Process, the City may appeal the APCO's SCR determinations to the California Air Resources Board (CARB) under the provisions of Health and Safety Code Section 42316 (Section 42316). The CARB will act within 90 days on the City's appeal.

The City shall prepare and submit for the APCO's consideration and written approval, which approval shall not be unreasonably withheld, a Remedial Action Plan as described in Paragraph 6 to address the exceedance(s). The City shall submit the Remedial Action Plan within 60 days of the date the SCR determination becomes final.

Go to A.4.

A.4 – City implements dust controls.

DCMs for new areas will be operational within the times set forth in the DCM Operation Schedule incorporated as Attachment B, Exhibit 3. The City is solely responsible for all environmental impact analyses required by the California Environmental Quality Act and for all required permits and leases.

A.5– District collects additional physical evidence and installs sand flux monitors in suspected areas.

If there is insufficient physical evidence and no sand flux monitor data to determine the emissive area on the lake bed that caused the monitored or modeled exceedance, the District will install Sensits and Cox Sand Catchers (CSC) sand flux monitors in the suspected area in a sampling array with a maximum spacing of one kilometer. The District will also continue to collect other physical evidence.

B. MODELED EXCEEDANCES

B.1 – Does the Dust ID model predict a 24-hour shoreline concentration greater than 150 $\mu g/m^3$, including background?

Dispersion Modeling Analysis.
At least once a year, the District will examine the Dust ID information and dispersion model to determine if there have been any modeled shoreline exceedances since the period included in the last model run. Modeling will be performed following the 2008 Owens Lake Dust Source Identification Program (Dust ID) Protocol (Attachment C).

K-factors.
New K-factors may be generated from PM_{10} concentrations measured at any shoreline or near-shore PM_{10} monitor using the methods described in the Dust ID Protocol. The order of priority for applying K-factors in the model will be:

1) The current temporal and spatial 75th percentile hourly K-factors. The District will use the current modeling period temporal and spatial 75th percentile hourly K-factors to model events, if there are nine or more hourly K-factors for an agreed upon seasonal period and area determined by the methods described in the most current Dust ID Protocol.

2) If there is no agreement on seasonal cut-points, the default cut points, as shown in Attachment B, Table 2, will be used with number 1, above.

3) If there is no agreement on area, the default areas, as shown in Attachment B, Map 1, will be used with number 1, above.

4) If there are fewer than nine hourly K-factors for any area and period, go to 5), below.

5) Default K-factors from Attachment B, Table 2. The District will use the K-factors in Attachment B, Table 2 to model events, based on the month of the event being investigated and the K-factor area. If the new dust source area is not within a K-factor area shown in Attachment B, Table 2, the APCO shall determine the default K-factor for the new source area based on the default K-factors of areas with similar soil characteristics.

Source Area Size, Location and Sand Flux.
The boundary of a dust source area will be delineated by a GPS survey. Under certain circumstances, the surveyed boundary of the dust source area will not result in a closed polygon. If the GPS survey yields a partial boundary and not a closed polygon, then the polygon area may be closed, if the length of the closure is equal to or less than one-half kilometer or is less than 20 percent of the surveyed source area perimeter, whichever is smaller. The ends of the partial surveyed area boundary will be completed with a straight line, unless survey notes or visual observations indicate that a different shaped boundary should be used. If the surveyed source area boundary has a complex shape, then the partial boundary to be closed will use the best available field and visual data to connect the two ends and form the polygon. Boundaries of existing controlled areas or other previously located boundaries will be used in place of a GPS survey boundary, if the survey notes or visual observations indicate the erosion area extends to that boundary.

If the GPS boundary described above is not available, the area will be defined by any one or a combination of GPS surveying, visual observations, and video observations or any other method described in the Dust ID Protocol.

The details of how to delineate source area boundaries are contained in the Dust ID Protocol.

If neither the GPS boundary nor the other physical evidence as described above is available, the default area size will be one square kilometer centered on the SFM, or one grid cell if the SFM are in a closer array.

All data collected by the District pursuant to this Section shall be shared with the City within 30 days of final data review. If the modeling shows that lake bed source areas have caused or contributed to any modeled shoreline PM_{10} impact greater than 150 $\mu g/m^3$ for a 24-hour average, go to B.7. If not, go to B.2.

B.2 – Is the modeled concentration less than 100 $\mu g/m^3$?

This refers to the modeled concentration calculated in B.1 and includes the background PM_{10} level of 20 $\mu g/m^3$. If yes, go to B.6. If no, go to B.3.

B.3 – District directs the City to commence environmental impact analysis, design and permitting.

The APCO will direct the City in writing to choose the BACM it wishes to implement in the area identified in B.1.

The City will develop a scope of work for the identified potential source areas, including: (1) a summary of the sites pertinent conditions, features, and location, (2) appropriate control alternatives and approach, including a conceptual layout of dust control and integration into the TDCA (roads, water supply, drainage, and power), (3) standard and site-specific permitting considerations, (4) anticipated environmental documentation considerations and approach, and (5) an approximate timetable for implementation beginning at an undefined start date that might coincide with a future SCR determination . City shall complete these steps within 180 days of the date of the written direction from the APCO. Go to B.4.

B.4 – District deploys reference and/or non-reference method Special Purpose PM_{10} monitor(s) to confirm model (if not already deployed).

The District will deploy reference and/or non-reference method Special Purpose PM_{10} monitor(s) on the lake bed upwind and downwind of the identified emissive area, if there are no existing monitors at locations that can be used in Section B.5 to refine the model predictions. Monitors will be sited between 250 and 5000 meters outside of any GPS'd or observed source area boundaries. These PM_{10} monitoring sites may be removed after the model confirmation procedure described in B.5. Shoreline and near-shore PM_{10} monitors that are sited to confirm the model may be used for NAAQS compliance, if an exceedance is monitored. Go to B.5.

B.5 – Is the refined model prediction greater than 150 $\mu g/m^3$?

For each event measured under Section B.4 that results in a 24-hour monitored concentration of greater than 100 $\mu g/m^3$, the event-specific K-factor (defined in the Dust ID Protocol) will be used to model the concentration at the shoreline receptors. If the event-specific K-factor was derived for the same year and season as the original event modeled in B.1, the Section B.1 event will be remodeled using the new K-factor. If either that remodeled concentration for the Section B.1 event, or the new modeled concentration for the on-lake monitored event, is greater than 150 $\mu g/m^3$ at a shoreline receptor, go to B.7. If not, go to B.6.

The District will make a determination if any currently modeled event within the same season and K-factor area using the appropriate K-factors as determined by this procedure causes a shoreline receptor to exceed 150 $\mu g/m^3$. If yes, go to B.7.

B.6 – No action required.

No action is required of the City at this time. Data collected during this period can be used in conjunction with data collected at a later time to define emissive areas on the lake bed according to this protocol and to develop K-factors for emissive areas.

B.7 – District directs the City to implement dust controls.

Source areas in B.1 and B.5 that cause or contribute to an exceedance may be new source areas or existing source areas with less than the required level of control (MDCE not high enough to prevent exceedances).

The APCO will determine, in writing, that conditions specified in Sections B.1 or B.5 were met for the specified area. Within 30 days of that determination by the APCO, the City will be notified of that determination in writing. If possible, the City will have the choice of increasing the control efficiencies on existing dust control areas and/or controlling other contributing sources that will result in lowering the modeled impact below the 150 µg/m³ exceedance threshold. If the APCO identifies the need for additional controls, the APCO shall issue a written SCR determination to the City.

If the City does not agree with the APCO's determination, the City may, within 60 days of the APCO's determination, submit to the District an alternative analysis of the data used by the APCO to make the determination. If the City submits an alternative analysis, the APCO shall consider the City's analysis and may withdraw, modify or confirm the SCR determination. If the APCO takes action to withdraw or modify the SCR determination, he shall do so within 60 days of the City's submittal of the alternative analysis.

If the APCO issues a modified SCR determination or confirms the initial SCR determination and the City does not agree with the APCO's final action, the City may initiate the Dispute Resolution Process pursuant to Paragraph 32 of the 2006 Settlement Agreement between the District and the City (Attachment A to Board Order 080128-01). The APCO may modify the SCR determination based on the Dispute Resolution Process.

In the event the Parties are unable to resolve disagreements over the APCO's SCR determinations through the Dispute Resolution Process, the City may appeal the APCO's SCR determinations to the California Air Resources Board (CARB) under the provisions of Health and Safety Code Section 42316 (Section 42316). The CARB will act within 90 days on the City's appeal.

The City shall prepare and submit for the APCO's consideration and written approval, which approval shall not be unreasonably withheld, a Remedial Action Plan as described in Paragraph 6, above, to address the exceedance(s). The City shall submit the Remedial Action Plan within 60 days of the date the SCR determination becomes final.

Go to B.8.

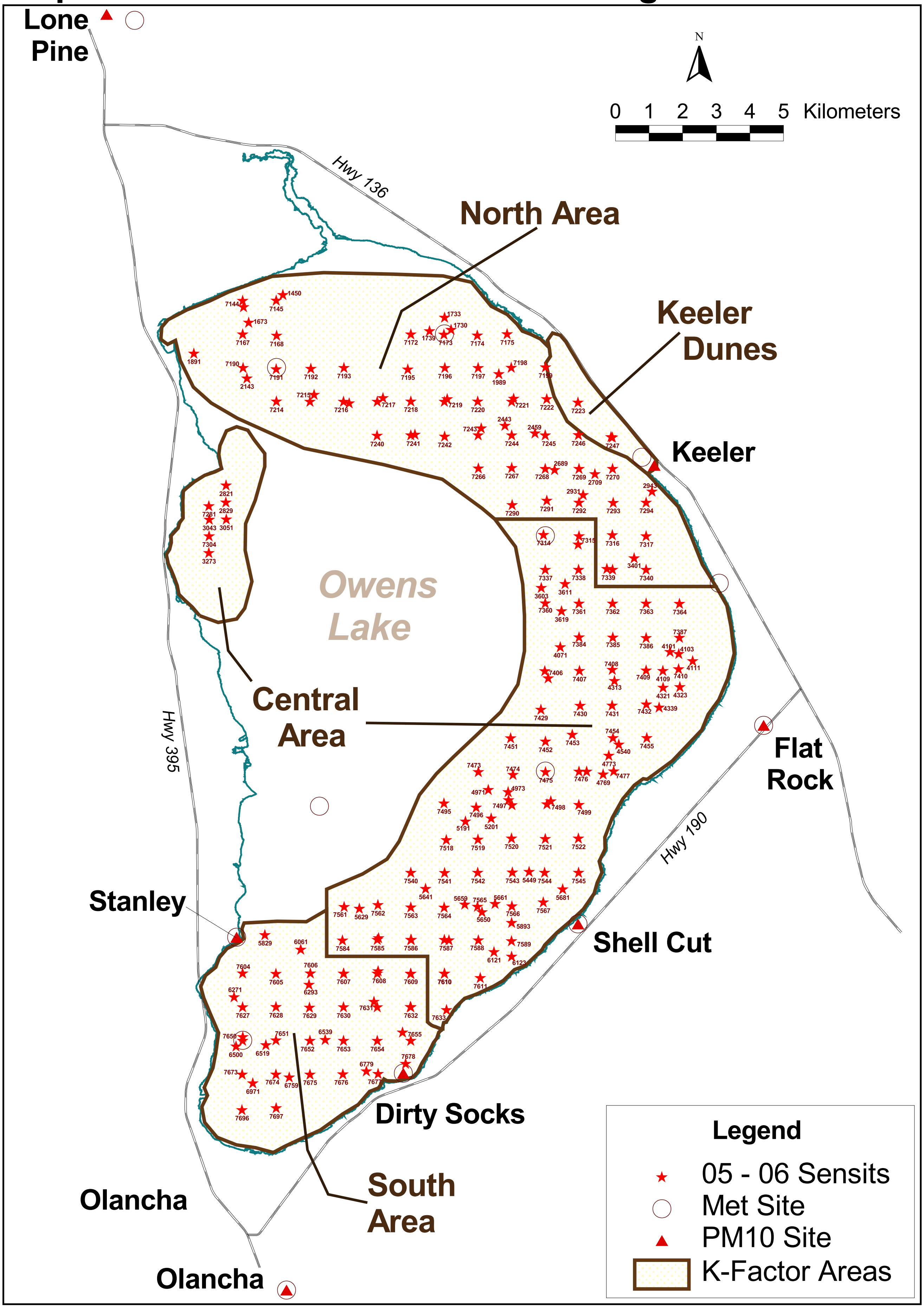
B.8 – City implements BACM.

DCMs for new areas will be operational within the times set forth in the DCM Operation Schedule incorporated as Attachment B, Exhibit 3. The City is solely responsible for all environmental impact analyses required by the California Environmental Quality Act and for all required permits and leases.

For source areas that arrive at B.7 from B.5, all time periods in the above referenced implementation schedule in B.8 shall apply but be reduced by the time period elapsed since the date of the written direction from the APCO described in Section B.3, or one year, whichever is less.

<u>Attachment B Enclosures</u>

Map 1 - Owens Lake Dust ID monitoring network



Attachment B - Table 1

From-the-Lake and Non-Lake Wind Directions for PM_{10} Monitor Sites

PM_{10} Monitor Site	From-the-Lake Wind Dir. (Deg.)	Non-lake Wind Dir. (Deg.)	Met Tower
Lone Pine	126≤WD≤176	WD<126 or WD>176	Lone Pine
Keeler	147≤WD≤290	WD<147 or WD>290	Keeler
Flat Rock	224≤WD≤345	WD<224 or WD>345	Flat Rock
Shell Cut	WD≥227 or WD≤ 33	33<WD<227	Shell Cut
Dirty Socks	WD≥234 or WD≤50	50<WD<234	Dirty Socks
Olancha	WD≥333 or WD≤39	39<WD<333	Olancha
Bill Stanley	WD≥349 or WD≤230	WD<349 or WD>230	Bill Stanley
New Sites	TBD	TBD	TBD

TBD – From-the-lake and non-lake wind directions will be determined for new sites by the APCO when sites are selected.

Attachment B - Table 2

Default Spatial and Temporal K-factors for the Dust ID Model

AREA	K-factor Jan.– Apr. & Dec.	K-factor May-Nov. (These are the default cutpoints.)
Keeler Dunes	7.4×10^{-5}	6.0×10^{-5}
North Area	3.9×10^{-5}	1.5×10^{-5}
Central Area	12.0×10^{-5}	6.9×10^{-5}
South Area	4.0×10^{-5}	1.9×10^{-5}

Attachment B - Exhibit 1: Schedule of Contingency Measures

From 2006 Settlement Agreement

EXHIBIT 10 -- SCHEDULE OF CONTINGENCY MEASURES

Issue	***Resolution***	***Duration***	***Units***
Moat and Row			
Eroded row	Install armoring to prevent further erosion	2	mo/mile
	Install sand fences to prevent further erosion	1	mo/mile
	Reconstruct row in place or adjacent	2	mo/mile
Filled moat	Re-excavate new moat outboard of filled moat, expand existing row onto filled moat	2	mo/mile
Filled sand fence	Clean out or flank with new sand fences	2	mo/mile
Collapsed sand fence	Repair or flank with new sand fences	1	mo/mile
Spacing too large	Pull in intervening sand fence	1	mo/mile
	Add intervening moat and row	3	mo/mile
	Enhance with vegetation and/or wetness	12 to 36	months
	Soil roughening	1 to 3	months/sq mi
	Conversion to reduced BACM/BACM	See Exhibit 11	
Managed Vegetation			
Emissions from bare areas	Enhance/restore vegetation	36	months
	Stabilize by other means (e.g., moisture, sand fences)	1 to 6	months/sq mi
Emissions from vegetated areas	Determine and establish necessary cover	36	months
	Stabilize by other means (e.g., moisture, sand fences)	1 to 6	months/sq mi
Gravel Patches			
Infilling pore spaces	Supplement gravel depth	4	months/sq mi
	Stabilize by other means (e.g., vegetation, wetness, sand fences)	6 to 36	months
Shallow Flood			
Emissions from dry areas (insufficient uniformity of wetting)	Wet dry areas. May require land leveling and/or additional laterals.	12	months
Generally too dry	Increase water application rate relative to ET	1	month
Other features			
Gravel source	Open new or re-open existing quarry	4	months
Emissions from roads, berms, etc.	Increase watering frequency	1	month
	Stabilize by other means (e.g., gravel, stabilizing agents)	1 to 4	months/sq mi

Attachment B - Exhibit 2

From 2006 Settlement Agreement

EXHIBIT 11 -- MOAT AND ROW TRANSITION SCHEDULE

Activity	Duration (years)
Shallow flood transition from moat & row	1.9
Managed vegetation transition from moat & row	5.9
Gravel cover transition from moat & row	1.8
Mutually agreeable exceptions:	*Increase over and above durations listed above (years)*
1. Mainline capacity increase	2.1
2. New aqueduct turnout	1.4
3. New power feed	1.0

Attachment B - Exhibit 3

From 2006 Settlement Agreement

EXHIBIT 12 -- DCM OPERATION SCHEDULE

Activity	Duration (years)
New area shallow flood DCM[a]	2.9
New area managed vegetation DCM[a]	6.1
New area gravel cover DCM[a]	2.2
Mutually agreeable exceptions:	*Increase over and above durations listed above (years)*
1. Mainline capacity increase	2.1
2. New aqueduct turnout	1.4
3. New power feed	1.0
4. Expanded CEQA triggered	1.4

[a]Assumes that total new area <2 square miles per year

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Board Order 080128-01
Attachment C

2008 Owens Lake Dust Source Identification Program Protocol

Great Basin Unified Air Pollution Control District
157 Short Street, Bishop, California 93514
Telephone (760) 872-8211

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2008 Owens Lake Dust Source Identification Program Protocol

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Glossary of Terms and Symbols

AIRS	US Environmental Protection Agency's Aerometric Information and Retrieval System
ATV	All-Terrain Vehicle
APCO	Air Pollution Control Officer
BACM	Best Available Control Measure
BACT	Best Available Control Technology
CAAA	Clean Air Act Amendments of 1990
CALMET	A meteorological preprocessor program for CALPUFF.
CALPUFF	An air pollution model
CARB	California Air Resources Board
CSC	Cox Sand Catcher, a passive sand flux measurement device.
DCA	Dust Control Area
DCM	Dust Control Measure
Dust ID Program	Owens Lake Dust Source Identification Program
EIR	Environmental Impact Report
Event-specific K_f	Weighted-average of hourly K-factors for a dust event, weighted by the hourly PM_{10} concentration
Exceedance	Modeled or monitored PM_{10} > 150 µg/m^3 at the shoreline
FTEE	Full-time equivalent employee
GBUAPCD	Great Basin Unified Air Pollution Control District
GIS	Geographic Information System
GPS	Global Positioning System
KE	Kinetic energy
K-factor	Proportionality constant for sand flux and PM_{10} emissions, K_f
LADWP	City of Los Angeles Department of Water and Power (also City)
m^3	cubic meter
met	meteorological
mg	milligram
MSM	Most Stringent Measure
NAAQS	National Ambient Air Quality Standards
NEAP	Natural Events Action Plan
OVPA	Owens Valley PM_{10} Planning Area
PC	Particle count
PM_{10}	Particulate matter less than 10 microns aerodynamic diameter
QA	Quality Assurance
RASS	Radio Acoustic Sounding System
RSIP	Great Basin APCD 2003 Owens Valley PM_{10} Planning Area Revised State Implementation Plan

Sensit	An electronic sand motion detector.
Settlement Agreement	2006 Settlement Agreement between LADWP and GBUAPCD
Storm-average K_f	Arithmetic average of hourly K-factors for a dust event
SCR	Supplemental Control Requirements of the 2003 SIP
SFM	Sand flux monitor
TEOM	Tapered-Element Oscillating Microbalance, measures PM_{10}.
USEPA	United States Environmental Protection Agency
USGS	US Geological Survey
WD	Wind direction
2003 SIP	Great Basin APCD 2003 Owens Valley PM_{10} Planning Area Revised State Implementation Plan
µg	microgram

2008 Owens Lake Dust Source Identification Program Protocol

1. Program Overview

1.1 Introduction

The objective of the Owens Lake Dust Source Identification (Dust ID) Program is to identify dust source areas at Owens Lake that can cause or contribute to violations of the National Ambient Air Quality Standards (NAAQS) for PM_{10}. The Dust ID Program is a long-term monitoring program that is intended to identify dust source areas for control under the provisions of the Supplemental Control Requirements (SCR) in the 2003 revised Owens Valley PM_{10} State Implementation Plan (RSIP) and the 2006 Owens Lake Settlement Agreement (Settlement Agreement). The text of the Settlement Agreement and SCR provisions is included in the appendices to this document.

The RSIP and Settlement Agreement require the City of Los Angeles Department of Water & Power (City) to control all sources of wind blown dust from the lake bed of Owens Lake that cause or contribute to an exceedance of the PM_{10} NAAQS at the historic shoreline (3,600-foot contour line). Based on dust events that occurred between January 2000 and July 2006, 43 square miles of the lake bed were found to cause or contribute to NAAQS violations. Dust controls are required to be implemented on 29.8 square miles of the lake bed by December 31, 2006, and an additional 13.2 square miles by April 1, 2010.

Provided that these control measures are implemented in accordance with the RSIP and Settlement Agreement, the District will suspend making determinations to control additional dust source areas from December 4, 2006 until May 1, 2010. During this period, all monitoring, modeling and observations will continue as described in this Dust ID Program Protocol. Data and information collected during this period will be used to determine any control requirements for Study Areas as described in the Settlement Agreement, and to advise the City on any monitored dust emissions from the lake bed and surrounding areas. If any new lake bed dust source areas are identified from data collected after April 1, 2010, they will be subject to dust control requirements as provided for in the Settlement Agreement and any future revisions to the Owens Valley PM_{10} State Implementation Plan. SCR determinations shall make reasonable efforts to account for impacts caused by Dust Control Measure (DCM) construction activities.

1.2 Locating Dust Source Areas

A network of sand flux samplers, PM_{10} monitors, meteorological towers and remote camera sites will be used to monitor and locate dust source areas at Owens Lake. Figure 1.1 shows a map of the Dust ID network at Owens Lake. As configured in 2003, the Dust ID network included: sand flux monitors at 136 lake bed sites at 1-km spacing, 7 PM_{10} monitors, 13 met towers, 8 observation sites, and 10 time-lapse cameras at 7 sites. At the discretion of the Air Pollution Control Officer, additional sand flux, PM_{10} and met sites will be added as necessary to collect information that can be used to monitor and model the impact from new areas that may become emissive on the lake bed.

The automated monitoring network will be augmented with information from observers who will map dust source locations from off-lake sites when dust events take place during normal work hours. These maps will be used to help document source areas that may be outside the sand flux network or that may be within the network, but missed by the samplers. Field personnel will inspect active source areas and map the source area boundaries using a GPS (Global Positioning System) as conditions allow. Data collected from the sand flux network, visual mapping and GPS surveys will be included in a Geographic Information System (GIS) database for mapping and analysis. Maps generated using these different methods will be compared qualitatively to help delineate source area boundaries.

1.3 Monitored Exceedances

Analysis of hourly PM_{10} concentrations at shoreline and off-lake monitoring sites may show that lake bed source areas cause or contribute to PM_{10} exceedances. Monitoring of PM_{10} concentrations will be done using US EPA-approved monitors. Currently, hourly PM_{10} readings are obtained using TEOM (Tapered-Element Oscillating Microbalance) PM_{10} monitors manufactured by R&P, Inc. If a PM_{10} exceedance is monitored, PM_{10} concentrations will be paired with the local wind direction for each hour of that event to determine if lake bed source areas caused or contributed to the exceedance.

Twenty-four hour average PM_{10} monitor concentrations will be adjusted for winds coming from the direction of the lake to the monitor (from-the-lake) and from directions not from the lake to the monitor (non-lake). PM_{10} concentrations during any hour with winds from a non-lake wind direction will be assumed to have an average background concentration of 20 $\mu g/m^3$ and from-the-lake wind directions will be given their hourly value. If the adjusted 24-hour average is greater than 150 $\mu g/m^3$, then an exceedance will have been monitored from a lake bed source or sources.

If a lake bed source area causes or contributes to an exceedance, hourly PM_{10} concentrations and wind directions will be reviewed to see if a new source area (or areas) is associated with that exceedance. If sand flux data are available that show erosion activity in the direction of a new source area, this event will also be modeled as described in the air quality modeling protocol. If the PM_{10} monitor data indicate that a new source area caused or contributed to an exceedance, DCMs may be required under the provisions of the Settlement Agreement or current SIP.

1.4 Modeled Exceedances

Air quality modeling will be performed with the CALPUFF modeling system or other United States Environmental Protection Agency (USEPA) approved modeling method. At least once a year, the Dust ID information will be examined and the model will be run to determine if there were any modeled shoreline exceedances since the period covered by the last model run. PM_{10} emissions for the model will be based on hourly sand flux measured at lake bed sites and spatial and temporal factors derived using the empirical relationship between sand motion on the lake

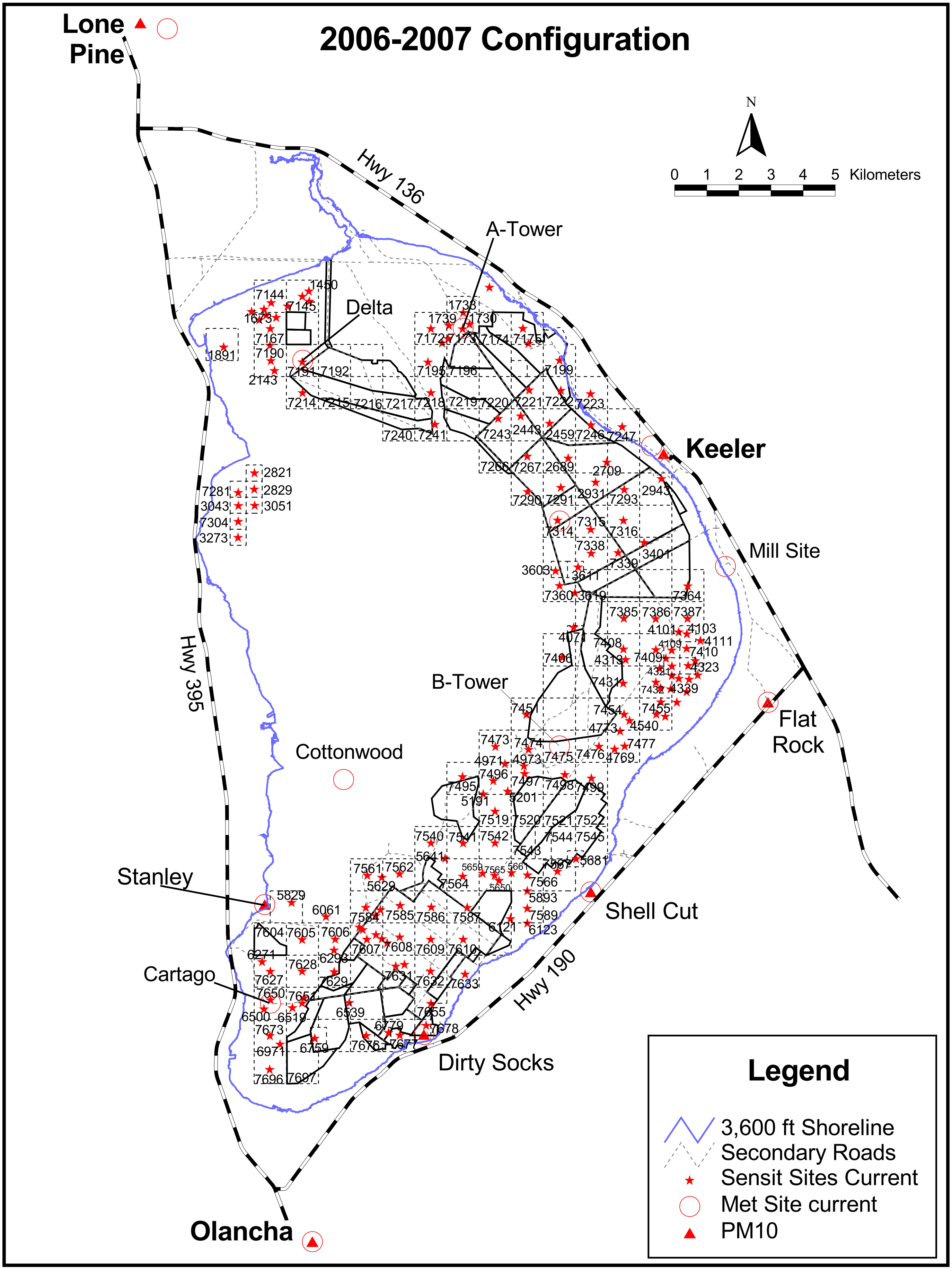

Figure 1.1 - Owens Lake Dust ID monitoring network

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bed and measured PM_{10} values. CALPUFF will be run using the following equation to estimate emissions and to model PM_{10} impacts at the shoreline:

Equation 1.1

$$PM_{10} = K_f \times q$$

where,

q = Sand flux measured at 15 cm above the surface [$g/cm^2/hr$]
K_f = K-factor, empirically-derived ratio of the PM_{10} emission flux to the sand flux at 15 cm.

The ratio of PM_{10} to sand flux (K_f) is referred to as the K-factor. The initial Dust ID program results showed that K-factors could be derived empirically by comparing model predictions to monitored PM_{10} concentrations. Initial studies also showed that average K-factors can vary spatially and seasonally at Owens Lake. Default K-factors will be used with Equation 1.1 to estimate hourly PM_{10} emissions unless new K-factors are generated from future dust events following the modeling procedures in this program protocol. If the CALPUFF model results indicate that a new lake bed source area caused or contributed to an exceedance at a shoreline location, dust controls may be required under the provisions of the 2006 Settlement Agreement or the current SIP.

1.5 Sand Flux Measurements

Sand flux is measured using a combination of Cox Sand Catchers (CSC) and Sensits. CSCs are sand collection devices that provide a mass collection amount for a certain time period (about 1 to 3 months), and Sensits are electronic sand motion detectors used to time-resolve the collected mass to estimate hourly sand flux rates. The sand flux rate is applied to the area represented by the sand flux sampling site, which may vary in size and shape depending on the source area delineated by field observations.

1.6 Dust ID Program Protocol Content

Section 2 of the Dust ID Program Protocol describes the methods and instrumentation that will be used to monitor sand flux with Sensits and CSCs on the lake bed. Section 3 provides a brief description of the PM_{10} and meteorological monitoring network that will be used to monitor PM_{10} exceedances, develop K-factors and to call public health advisories. Section 4 describes methods that will be used by visual observers and field personnel to map lake bed dust source areas and delineate boundaries using GPS. Section 5 explains the procedures for developing K-factors using air quality modeling and monitoring data. Section 6 provides the protocol for dispersion modeling.

2. Protocol for Measuring Sand Flux Rates and Operation of the Sensit and Cox Sand Catcher Network

2.1 Objective

Sand flux measurements will be used as a surrogate to estimate PM_{10} emissions coming off the lake bed. The objective of the sand flux measurements is to provide an hourly emissions estimate for all active source areas on the lake bed.

2.2 Methods and Instrumentation

Sand flux will be measured with Sensits and Cox Sand Catchers (CSCs). Collocated Sensits and CSCs are used to measure hourly sand flux rates at different locations on the lake bed. The 2006-2007 Sensit/CSC network locations are shown in Figure 1.1. The instruments are placed with their sensors or inlets positioned 15 cm above the surface. Sensits are electronic sensors that measure the kinetic energy or the particle counts of sand-sized particles as they saltate, or bounce, across the surface. Sensits are used to time-resolve the CSC mass to provide hourly sand flux rates.

Figure 2.1 shows a Sensit suspended above the ground on the right, and a CSC in the ground to the left. The photo was taken at a site that was used to test the accuracy of Sensits and CSCs before the Dust ID Program began. The battery powered Sensits are augmented with a solar charging system. A datalogger records 5-minute Sensit data during active saltation periods. Data collection is triggered by particle count activity and continues until particle counts are zero for an hourly period. Each datalogger has a radio transmitter that sends Sensit data to the District's Keeler field office once a day to provide updates on erosion activity at each site. These daily updates are used to alert field personnel to active source areas for possible Global Positioning System (GPS) mapping and inspection. Daily transmission of the data may be temporarily suspended if the solar battery power is low due to extended days of cloud cover.

CSCs are passive collection instruments that capture windblown, sand-sized particles. These instruments were designed and built by the District as a reliable instrument that could withstand the harsh conditions at Owens Lake. CSCs have no moving parts and can collect sand for a month or more at Owens Lake without overloading the collectors. Field personnel visit CSC sites to measure the mass of the collected sand catch. A diagram of the CSC is shown in Figure 2.2. Not shown in the diagram is an internal sampling tube that can be seen in the photo in Figure 2.3. The internal sampling tube is removed from the PVC casing to measure the sand catch sample. The lengths of the sampling tubes and casings are adjusted during construction to accommodate the amount of sand flux in each area and to avoid overloading the CSC. The CSC length ranges from about one to three feet. Because the PVC casing is buried in the ground, an adjustment sleeve is used to keep the inlet height at 15 cm to compensate for surface erosion and deposition. Field techs use a standardized measuring device to check or adjust the sampling inlets to 15 cm after collecting each sample.

Figure 2.4 shows an example of the linear relationship between the CSC collected sand mass and the kinetic energy measured with a co-located Sensit. Sensits measure saltation in terms of

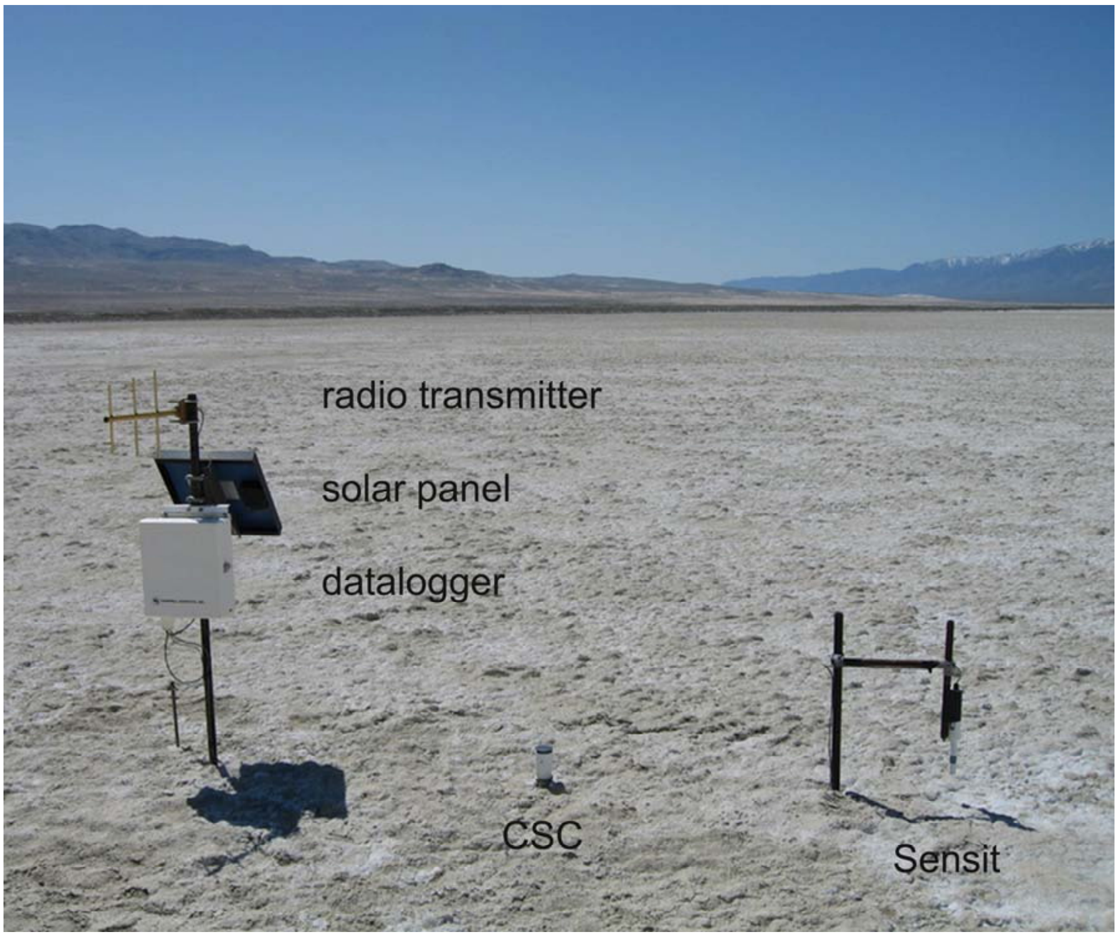

Figure 2.1 - Dust ID sand flux monitor sites measure wind erosion activity using CSCs to collect sand-sized particles and Sensits that electronically detect moving particles. Sensit data are recorded on dataloggers and transmitted by radio from each site to the District's office in Keeler.

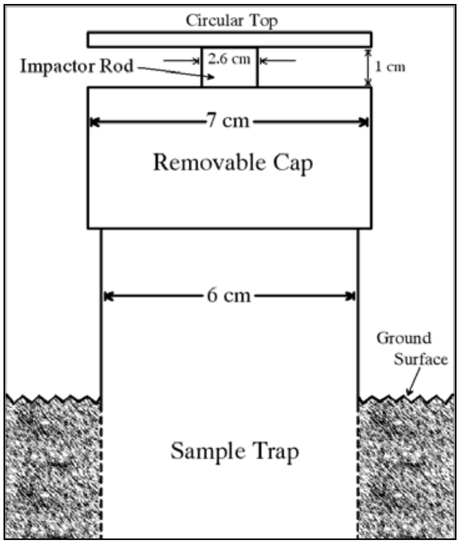

Figure 2.2 - Diagram of the Cox Sand Catcher (CSC) used to measure sand flux at Owens Lake.

Figure 2.3 - Example of a Cox Sand Catcher (CSC) with the inner sampling collection tube removed.

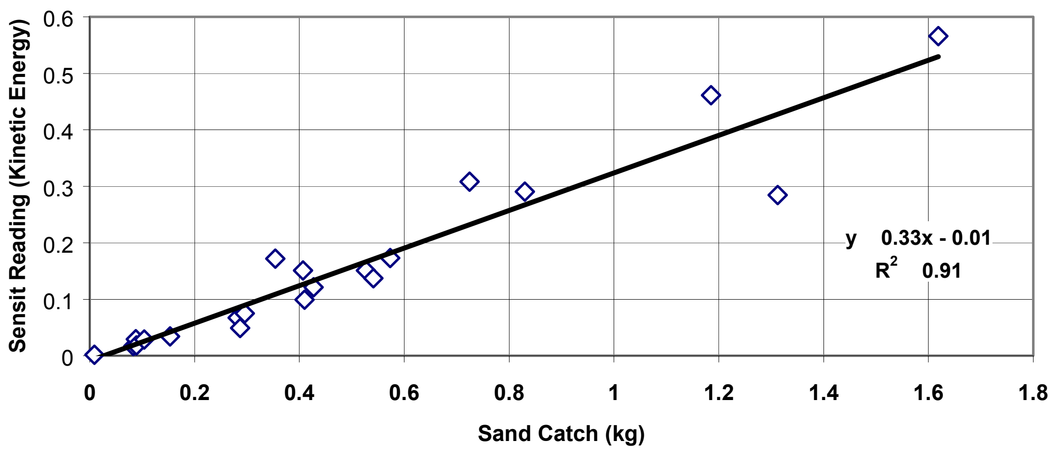

Figure 2.4 - Example of the linearity between CSC mass and a Sensit reading using kinetic energy reading (Sensit No. 7291).

kinetic energy (KE) and particle count (PC). The District uses the output (KE or PC) that provides the best precision and accuracy for the range of saltation activity expected at each site.

Because the electronic Sensit response to the saltation flux can vary, Sensits were used in combination with CSCs to determine hourly sand flux rates. This combination takes advantage of the good precision and accuracy of the CSC sand catch data, and the ability of Sensits to time-resolve the sand flux for each hour of the CSC sampling period. In this way, the sum of the hourly sand catches always matches the CSC sand catch for each sampling period, and it minimizes the error in the hourly sand flux.

Changes to the sand flux monitoring network are made as necessary to improve the characterization of dust source areas on the lake bed. Sand flux sampler sites are added to the network to monitor new source areas or to improve the sand flux estimates for known dust source areas. Although the sand flux network was originally designed in a fixed grid pattern with 1 km site spacing, the current practice is to place the samplers at sites that represent smaller source areas. Some sites may be less than 250 m apart, and their locations may be off the regular grid pattern to better represent sand flux activity in the dust source area. In addition, many of the original sampling sites that are now in flooded portions of the shallow flood DCM were removed, since PM_{10} emissions from the flooded sites can be assumed to be zero in the Dust ID model.

2.3 Operating Procedures

Sand captured in the CSCs will be weighed in the Keeler lab to the nearest tenth of a gram. A field technician will visit each site every one to three months to collect the sample tubes. The following procedures will be used when collecting the CSC samples and downloading Sensit data:

1) Park field vehicle 10 meters or more east of the site and walk the remaining distance to the sampling site. Field personnel will access all Sensit and CSC sites from an easterly approach to minimize upwind surface impacts near the sampling sites.
2) Measure and record the inlet height above the surface to the middle of the inlet.
3) Remove the sample collection tube from the CSC.
4) Verify collection tube number corresponds to site number on the field form.
5) Weigh and record the gross weight of the collection tube and sample to the nearest 1 gram using a field scale.
6) If any soil material is visible in the tube, seal the collection tube and place it in the tube rack for transport to the lab. If no soil material is visible, note this on the collection form and reuse the collection tube for the next sampling period.
7) Place a clean collection tube in the CSC and record the collection tube number.
8) Replace the CSC inlet and adjust the height to 15 cm ($\pm$1 cm).
9) Download Sensit data from the datalogger to a storage module.
10) Measure and record the Sensit sensor height above the surface to the center of the sensor using the Height Adjustment Tool, and adjust if necessary to 15 cm. See Figure 2.5.
11) Inspect the sensor and radio transmitter wiring and clean or repair, if needed.

12) A field operational response test on the Sensit will be completed during each visit and the Sensit will be replaced, if it fails the test.
13) CSC samples will be removed from the sample collection tubes and weighed on a calibrated bench-top scale in the Keeler lab to the nearest 0.1 gram.
14) Wet samples will be removed from the collection tubes and oven dried before weighing in the lab.

2.4 Data Collection

A field form will be used to document the information for the CSC and Sensit (see example in Figure 2.6). The form will have the site number, date and time of measurement (Pacific Standard Time), “as is” CSC inlet and Sensit sensor height (± 1 cm), tube tare weight prior to sand catch (± 0.001 kg), total sand catch weight (± 0.001 kg), and post-catch tube weight (± 0.001 kg), Sensit response test (particle counts or kinetic energy), operator’s initials, and a comments section where the condition of the sampler and any other relevant factors, such as surface condition will be documented. The Data Processing Department will calculate the net sand catch weight from the CSC during data analysis. CSC lab weights, measured to the nearest 0.1 g will be recorded on the Lab Form shown in Figure 2.7. After completion of the forms, the field technician will make a copy of the completed forms and file the copies at the Keeler office. The original forms will be sent to Data Processing in the Bishop office. Data Processing will enter the data into an electronic file. The original hard copy forms will be filed in the Bishop office.

Each day, dataloggers for all Sensit sites will be downloaded by radio transmission to the Keeler Field office. Data from the storage modules will be downloaded to the computer at the Keeler office by the field technician at the end of a collection period. The radio transmitted Sensit data will be used as the data of record. Storage module data will be collected at least quarterly and will serve as a back-up file.

Technicians will keep a log of all the repairs, maintenance, or replacement of Sensits or CSCs, radio transmitters, and datalogger equipment. This log will be kept in a field notebook and the field forms sent to Data Processing as they are completed. It is the technician’s or operator’s responsibility to review the data and notify the Air Monitoring Specialist and Data Processing who will decide whether any data should be edited or deleted and why.

2.5 Chain of Custody

Each field form will be initialed and dated by the field technician during each site visit. The form will be signed and dated by the person receiving the data when delivered to the Bishop office. If no person is available to sign the form in the Bishop office, the delivery person will sign and date the form and place it in the Data Processor’s box.

2.6 Quality Assurance

All field and lab scales will be checked at least every two months using Class F weights. Field scales will also be checked with a 100-gram weight at each sample site before weighing the sand catch and the weight recorded on the field form. The bench-top scale in the Keeler office will be

Figure 2.5 - A Height Adjustment Tool is used to measure the height of Sensits and CSCs and to adjust the sensor and inlet height to 15 cm above the soil surface.

CSC Field Form.xls

Technician: Date (mm/dd/yyyy): / /

Site #	Time PST	Pre-Sensit Height, cm	Sensit Response	Final Sensit Height, cm	Pre-CSC Inlet Height, cm	Field Cal Weight, kg	CSC Full, kg	CSC Tare, kg	Final CSC Height, cm	No VP
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	:					.	.	.		
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Marble Rankings: 0=No Crust 1=Complete Damage 2=Indent or Surface Damage 3=No Damage 4=Wet

Site #	Rank	Surface Description	Comments and Maintenance
Delivered By:			Date:
Received By:			Date:

Figure 2.6 - Example of a CSC and Sensit Field Documentation Form

CSC Lab Form.xls

Lab Technician: Tare Date (mm/dd/yyyy): / /

Lab Technician: Post Date (mm/dd/yyyy): / /

Site Tube #	Tube Tare, g	Tube/Catch Weight, g	Catch Weight, g	Comments
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Figure 2.7 - Example of a CSC laboratory documentation form

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checked with the Class F weights before each set of sand catches are weighed. The test weights will be recorded on the scale log sheet in the laboratory. Both scales will be calibrated and certified at least once every year. Ten percent of the CSC sand catch samples will be stored for at least one year from the date of collection before discarding.

2.7 Calculating Hourly Sand Flux

For modeling purposes discussed in Section 6, hourly sand flux is calculated for each Sensit/CSC site using the sand catch to Sensit reading ratio for each collection period and apportioning the sand catch to the hourly Sensit reading. The hourly sand flux is divided by 1.2 cm^2, which is the equivalent inlet opening size of the CSC for flux calculation purposes.

For Sensits using kinetic energy,

Equation 2.1

$$q_{n,t} = \left(S_{n,t} - S_{n,bg}\right) \times \frac{CSC_{n,p}}{\sum_{t=1}^{N}\left(S_{n,t} - S_{n,bg}\right)} \times \frac{1}{1.2} \quad [\text{g/cm}^2\text{/hr}]$$

Where,

$q_{n,t}$ = hourly sand flux at site n, for hour t [$g/cm^2/hr$]
$CSC_{n,p}$ = CSC mass for site n, for collection period p [g]
$S_{n,t}$ = Sensit total KE reading for site n, for hour t [non-dimensional]
$S_{n,bg}$ = Sensit KE background reading for site n, [non-dimensional]
N = Total number of hours in CSC collection period p.

For Sensits using particle count,

Equation 2.2

$$q_{n,t} = S'_{n,t} \times \frac{CSC_{n,p}}{\sum_{t=1}^{N} S'_{n,t}} \times \frac{1}{1.2} \ [\text{g/cm}^2\text{/hr}]$$

Where,

$S'_{n,t}$ = Sensit total PC reading for site n, for hour t [non-dimensional]

2.8 Sensit Calibration and Data Analysis

2.8.1 Sensit Calibration Check

Data Processing will track Sensits by their serial number. After each sample collection period, Sensit and CSC data will be added to data from other sample collections. Data Processing will determine the average sand catch to Sensit ratio for each Sensit. Sensit readings will be collected for particle counts and kinetic energy for each Sensit. Due to differences in individual Sensit responses, some Sensits have a more consistent sand flux to Sensit reading ratio using particle count rather than kinetic energy. This normally depends on the manufacturer's electronic design. At high sand flux sites, kinetic energy provides a more linear response for most Sensits. If KE is used, a background KE is subtracted from the reading if it is not zero. A background KE is determined from the KE reading when the PC reading is zero.

The ratio of the Sensit response to the collected mass will be compared for each collection period to previous ratios for the same instrument to ensure that the Sensit is responding consistently. As seen in Figure 2.4 this ratio can vary, especially at low collection masses, so large deviations in the ratio should only be used as an indicator for a possible problem. Sensits will be replaced if they show no readings with significant sand associated CSC collection, have significant readings during calm wind periods, have an erratic response as compared to previous collection periods, or if they fail the field operational response test.

2.8.2 Replacing Missing Sand Catch Data

Sand catch data can be lost if the CSC collector tube is full, or damaged, or if the sample is spilled during weighing. The lost sand catch data will be estimated using Sensit data. A cumulative sand catch to Sensit ratio is calculated by adding all of the valid sand catches and all of the corresponding Sensit data for that particular Sensit/CSC pair, and then dividing them to obtain the total ratio. The cumulative ratio is applied to the Sensit data to estimate the hourly sand flux. If there was a Sensit change, only data generated after the Sensit change is used to calculate the cumulative sand catch to Sensit ratio.

CSC collection tubes will be weighed and reset at the same time as any Sensit change at a site in order to maintain the time correlation between the two devices.

2.8.3 Replacing Missing Sensit Data

Sensit data can be lost when the datalogger or Sensit fails. In such cases, the sand catch data will be time resolved using a neighboring site. The historical hourly sand flux data are compared to determine which neighboring site behaves most similarly to the site with the lost data. The correlation coefficients between the data sets will be used to determine which site behaves most similarly. If no adjacent sites were active during the period of lost Sensit data, then the nearest active sites will be used for comparison.

3. Protocol for Measuring Ambient PM_{10} and Meteorological Conditions

3.1 Objective

Ambient PM_{10} monitors will be placed at locations generally around the shoreline of Owens Lake and in local communities to monitor the ambient air for exceedances of the PM_{10} NAAQS and to develop K-factors for modeling PM_{10} emissions from lake bed sources. PM_{10} monitors may be placed on the lake bed for short-term special-purpose monitoring studies.

3.2 Methods and Instrumentation for PM_{10} and Meteorological Data

PM_{10} monitoring will be performed using USEPA-approved reference or equivalent method monitors. The current monitoring network shown in Figure 1.1 includes seven PM_{10} monitor sites – Keeler, Lone Pine, Olancha, Dirty Socks, Shell Cut, Bill Stanley and Flat Rock. Each PM_{10} site is equipped with a Tapered Element Oscillating Microbalance (TEOM) PM_{10} monitor. TEOM monitors are capable of measuring hourly PM_{10} concentrations. The Dust ID Program will rely on the TEOM to determine if an exceedance is caused by a lake bed source, since the data can be correlated with hourly wind directions to determine dust source directions. TEOM data will also be used to generate K-factors to model the PM_{10} emissions from lake bed sources.

Ten-meter meteorological towers will be located near each PM_{10} monitor site and at other locations around the lakeshore and on the lake bed. The current met sites are shown in Figure 1.1. The met data are used to create wind fields with the CALMET model that are used with CALPUFF to model air quality impacts. All met towers include instrumentation to measure wind speed and wind direction. Two lake bed met sites (A & B Towers) measure wind speed at different heights (0.5, 1, 2, 5 and 10 m) to determine surface roughness and vertical wind speed profiles. Some met sites also measure temperature, relative humidity, barometric pressure, and/or precipitation.

3.3 Operating Procedures, Instrument Calibration and Quality Assurance

PM_{10} monitoring will be performed in accordance with USEPA monitoring guidelines found in 40 CFR, Part 58 and meteorological monitoring will be performed in accordance with USEPA Quality Assurance Handbook for Air Pollution Measurement Systems, Volumes I, II, and IV.

3.4 Data Handling and Data Access via Modem

TEOM PM_{10} data will be delivered to Data Processing on a routine monthly schedule. After the data pass the proper data review and QA checks they will be submitted to the USEPA's AIRS database. PM_{10} data from special-purpose monitors that may be located on the lake bed will not be submitted to the AIRS database.

All the PM_{10} sites and some met sites are equipped with modem links that allow for access to the hourly concentrations. These data are useful for alerting field personnel to possible new sources of PM_{10}, and for alerting the public in case of high concentrations. For hourly concentrations above 400 $\mu g/m^3$ the District will issue public health advisories when the communities of Keeler, Lone Pine or Olancha are affected. The public can view real-time wind speed, direction and PM_{10} data from the Dust ID monitoring network on the District's website at www.gbuapcd.org/data.

4. Protocol for Observing and Mapping Source Areas and Dust Plume Paths

4.1 Objective

The objective for source area mapping is to use the best available information from visual observations, GPS mapping, and sand flux measurements to delineate the boundaries of dust source areas for as many events as possible. This information will be used to help delineate the control area boundaries for new sources.

4.2 Methods and Instrumentation

The Dust ID Program includes four methods to help locate dust source areas and to delineate the source area boundaries. The methods are: 1) visual mapping by trained observers, 2) time-lapse cameras, 3) surface inspections with GPS mapping, and 4) sand flux activity (as measured with Sensits and CSCs).

4.2.1 Mapping Dust Source Areas from Off-Lake Observation Sites

One or more trained observers will complete observations from viewpoints to best observe the active dust source areas. For instance, two observers may be at viewpoints on the east side of the dust plume in the Inyo and Coso Mountains and a third may be on the west side in the Sierra. The observers will create hourly maps of the visible boundaries of any dust source areas, their plume direction and note if the visible plume crosses the shoreline. To the extent practicable, all lake bed and off-lake dust sources will be included in the observations. Figure 4.1 shows an example of sand flux measurements and the cumulative information that can be collected by observers mapping the dust plumes from different locations.

4.2.2 Video Cameras

Remote time-lapse video cameras will record dust events during daylight hours. This information will be reviewed to help identify source areas that may have been missed by observers, or to help confirm source area activity detected by PM_{10} monitors or the sand flux network. Remote time-lapse video can also be used to help verify modeled impacts that were not monitored by the PM_{10} network, to check compliance of dust control areas, and to identify off-lake sources not measured by any of the other methods.

4.2.3 Mapping Using GPS

4.2.3.1 "Trigger" Levels for Initiating Field Inspections and GPS Surveys

Dust observations, Sensit activity, elevated PM_{10} concentrations and video will be used as "trigger data" to determine the time and location for a Dust Source Area Survey (survey). Sensit and PM_{10} data will be automatically collected via radio transmission every workday. A technician will summarize and review the data each workday. The summary will list all Sensit activity greater than background output levels, and hourly TEOM PM_{10} concentrations over

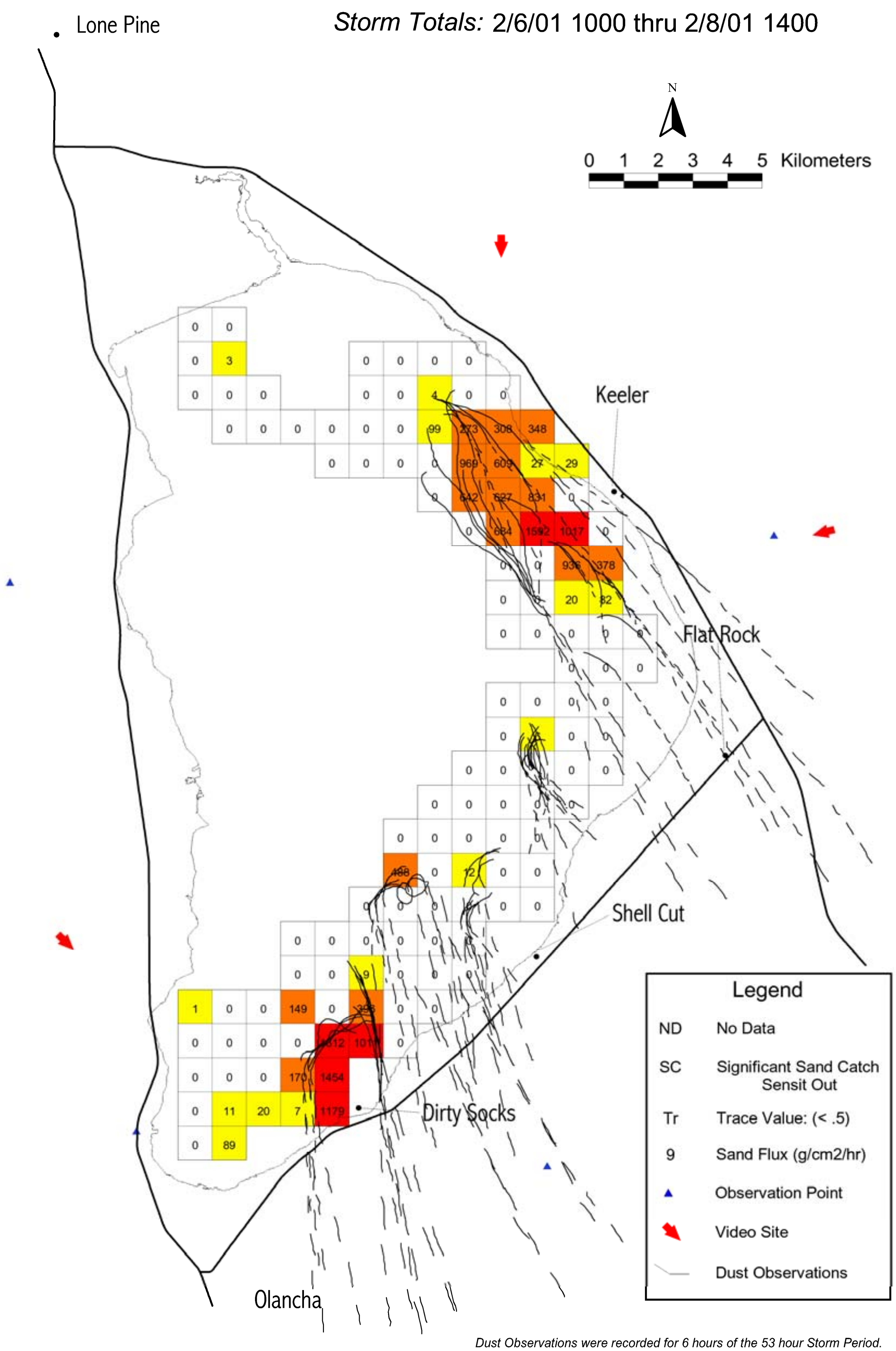

Figure 4.1 - Example of dust plume maps drawn by observers during daylight hours and total sand flux for a dust event on February 6-8, 2001.

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50 µg/m^3 with corresponding wind speed and direction data. If dust observations are available from a recent dust storm, they will be used to confirm the location of the dust source(s) that correspond with the Sensit activity and elevated PM_{10} concentration. Video will be used to identify a source or sources that were not identified by observations, Sensit data or PM_{10} information. Wind speed and wind direction data will be used to help determine if a lake bed dust source could have caused elevated PM_{10} concentrations. All of the trigger information will be used to identify any lake bed dust source area to initiate a dust source survey and/or surface inspection. The survey should be completed the same day if weather conditions are favorable. For larger areas, surveying may continue for several days or until precipitation obscures the boundaries of the source area.

In addition to the above process, general field inspections will be completed after dust storms to verify lake bed emission activity and the need for a survey. A survey will be completed if the trigger data and /or field inspections indicate emissive conditions in an area that has not been previously surveyed during the current dust period (Section 4.3) or in an area that has been previously surveyed but has increased in size since its last survey. The priorities for completing a survey are:

1) new lake bed source areas outside the instrumented Sensit network;
2) new lake bed source areas that have not been surveyed within the instrumented Sensit network; and
3) lake bed source areas that have previously been surveyed.

4.2.3.2 GPS Mapping Procedures

After a dust source is identified by dust observation, Sensit data, sand catch data, video, PM_{10} concentration or inspection of the lake bed surface, District staff will map the exterior boundary of as many of the source areas identified as possible during daylight hours, as weather conditions allow. The mapping will begin as soon as possible after a dust storm and continue until all the identified areas are mapped or precipitation occurs. The boundary of the emissive area(s) will be mapped using a Global Positioning System (GPS). Surveyors conducting the mapping will ride an ATV or walk around the outer boundary of the wind-damaged surface surveying a line with the GPS. A wind-damaged surface is defined as a soil surface with wind erosion evidence and/or aeolian deposition that has not been modified to an unrecognizable point by precipitation since the last identified dust storm.

GPS line data should be collected at an interval of one record every 10 seconds or less. Data should be collected in NAD83 UTM Zone 11 coordinates. Only GPS units capable of continuously recording line data will be used. Data should be processed and corrected using base station data (either from a commercial correction service or using data from the District’s Keeler base station) to ensure positional accuracy.

Before beginning a survey, the edge of the source area is determined by a visual review of the surface conditions within a representative one square meter area along the edge of the source area. An undamaged surface is evident if there is no visible evidence of a disturbed lake bed surface due to wind damage. As an aid to calibrate the level of disturbed surface, a surveyor will begin each survey by estimating the percentage of surface that is undamaged by the wind. The surveyor visually determines where a surface with 70 to 80 percent of undisturbed surface is located. The surveyor completes the survey by following a line of travel that closely represents the initial one-meter calibration. The following defined list, Boundary Conditions and Survey Procedures (see below), can be used to determine how to map the source boundary under differing surface boundary conditions.

Boundary Conditions and Survey Procedures:

Distinct Boundary: A visibly sharp transition, 25 feet or less in width, between a wind-damaged lake bed surface and an undamaged lake bed surface. The surveyor should travel directly along this distinct outside edge, if possible, and may deviate 25 feet to the inside or outside on occasion. Small (25-foot wide or less) channels, boundary indentations, roads, mounds, and other obstacles may be directly crossed if the continuation of the main source boundary is clearly visible on the opposite side.

Diffuse Boundary: A visibly distinct transition, 25 to 100 feet in width, between a wind-damaged lake bed surface and an undamaged lake bed surface. Every effort should be made to travel along the outermost edge of the visible distinction.

Indistinct Boundary: **A** boundary that is not obvious to the surveyor where the edge of the source is located. Mapping would be stopped at this point until a Distinct or Diffuse Boundary can be located.

Generally the surveyor will maintain a constant course of travel following the Distinct Boundary of the wind-damaged area. As the boundary becomes less distinct, it is recommended to move the course of travel further into or outside the source to maintain recognition of surface damage. It is acceptable to travel within approximately 50 feet of the outer or inner edge of the larger more noticeable active area if the boundary is Diffuse. When encountering an Indistinct Boundary condition, the surveyor should note if the boundary can be found or if the boundary cannot be mapped during the existing survey and why. If the boundary cannot be mapped, the survey shall end at that point leaving an unclosed source area polygon.

It is possible for the surveyor to find himself or herself greater than 50 feet within or outside of the source area boundary. When this happens, the surveyor should turn perpendicular to the direction they were traveling and travel in the direction where the distinct edge should be located. For example, if the surveyor were inside the source area, they would turn in the direction where erosion evidence was not observed earlier along their path. If the surveyor were outside the source area, they would turn toward the side where they previously observed the source. Boundary loss may occur because of an Indistinct Boundary or unfavorable lighting conditions. The time and coordinates should always be noted when it is necessary to relocate the boundary during a survey.

Another alternative for relocating a source area edge is to pause the GPS unit from recording data until the boundary is located and then resume with data collection. This allows the surveyor to travel in any direction until the edge is relocated or end the survey if an edge cannot be located. The line produced between the point where the GPS unit was paused and then restarted would be deleted and considered un-surveyed during post processing.

The presence of Indistinct Boundaries or conditions that cause the ending of a survey must be annotated on the GPS data or explained in the field notes, including point coordinates. Examples would include dust storm, precipitation, lightning, mud, and channel with flowing water, pond, and time constraint or equipment malfunction.

4.2.4 Using Sand Flux Monitors to Map Source Area Boundaries

Dust source area boundaries can be delineated or refined using default cell boundaries represented by active sand flux monitors. The area represented by the active SFM site may be shaped to exclude known non-emissive areas, such as; DCM areas, wetlands, or areas with different soil texture where there is evidence that it is non-emissive.

4.3 Composite Dust Source Map Development

Data Processing will compile the cumulative mapping information from the visual observers and field inspections using the GPS into a GIS database for two periods each year, December through June and July through November. A new composite map will be developed for each period containing only those data collected during that period. Hand drawn observation maps will be scanned and translated into the GIS database. Observation maps will be compared with source area locations from other methods through the GIS generated layers. Overlays of the maps generated from sand flux monitors, video cameras, visual observers and GPS'd source areas will be compared qualitatively, considering the information may have been collected at different times.

5. Protocol for Determining K-factors and PM_{10} Emission Rates from Sand Flux Data

5.1 Objective

The objective of this portion of the Dust ID Program is to estimate the PM_{10} emission flux for each cell or source area using the relationship *PM_{10} emission flux = sand flux x K-factor*. PM_{10} emissions for each area will be used with the CALPUFF modeling system or other USEPA approved model to determine if the PM_{10} emissions will cause or contribute to a NAAQS violation at the shoreline.

5.2 Method for Determining PM_{10} Emissions and New K-factors

5.2.1 PM_{10} Emission Flux = Sand Flux x K-factor

PM_{10} emissions will be estimated using the sand flux for each area represented by a Sensit and CSC and an appropriate K-factor for the area and period. The sand flux values will come from the Sensit and CSC data as discussed in Section 2. New K-factors for each area and period will be developed as discussed in this section, and default K-factors will be used to model dust events unless newer K-factors are determined.

5.2.2 Default Temporal and Spatial Storm-average K-factors

PM_{10} emissions may be estimated from default K-factors that were developed from previous dust events that occurred in the same area and the same range of calendar months in previous years.

The areas for K-factor groupings are shown in Figure 1.1: North Area, Central Area, Keeler dunes, and the South Area. Any new source area within the depicted boundaries will be associated with that area for the spatial grouping of new K-factor values. If a new source area and K-factor is developed for an area outside these boundaries, the area and default K-factor will be associated with the K-factor for an existing area with the most similar surface soil texture. The determination of the most similar existing area will be made by the Air Pollution Control Officer.

5.2.3 Method to Determine Sand Flux from Areas with Implemented Dust Control Measures (DCM)

Sand flux will be measured at sites within the shallow flood and managed vegetation DCM areas. Sensits and CSCs will be sited on dry areas within the shallow flood DCM to represent dry areas near the site. DCM areas covered with standing water will be assumed to have zero sand flux. For the Managed Vegetation DCM, sand flux sites will be placed in spatially representative areas and in areas within the DCM where wind blown dust may have been previously observed.

5.2.4 New K-factors Seasonal Cut-points

The APCO will review the K-factor data and propose seasonal cut-points to the LADWP. LADWP will respond to the proposed cut-points within 30 days. If no agreement can be reached within 60 days, the default periods will be used.

The two default periods to be used are: the winter/spring period that includes the months of December, January, February, March and April, and the summer/fall period that includes May through November. These same calendar months will be used to generate new temporal K-factors for each area and to generate new 75-percentile hourly K-factor values for modeling PM_{10} emissions.

5.2.5 Using CALPUFF Modeling System to Generate New K-factors

New hourly K-factors can be inferred from the CALPUFF model by using hourly sand flux as a surrogate for PM_{10} emissions. Modeled PM_{10} predictions can then be compared to monitored concentrations at PM_{10} monitor sites to determine the K-factor that would correctly predict the monitored concentration for each hour. More information on the modeling procedures is included in Section 6.

A K-factor of 5 x 10^{-5} will be used initially to run the CALPUFF model and to generate concentration values that are close to the monitored concentrations. Hourly K-factor values will then be adjusted in a post-processing step to determine the K-factor value that would make the modeled concentration match the monitored concentration at the PM_{10} monitor site. The initial K-factor will then be adjusted using Equation 5.2.

<u>*Equation 5.2*</u>

$$K_f = K_i \left(\frac{C_{obs.} - C_{bac.}}{C_{mod.}} \right)$$

Where,

K_i = Initial K-factor (5 x 10^{-5})
$C_{obs.}$ = Observed hourly PM_{10} concentration. [µg/m^3]
$C_{bac.}$ = Background PM_{10} concentration
$C_{mod.}$ = Model-predicted hourly PM_{10} concentration. [µg/m^3]

5.2.6 Screening Hourly K-factors

K-factors will be calculated for every hour that has active sand flux in cells upwind from a PM_{10} monitor. These hourly K-factors will be screened to remove hours that did not have strong source-receptor relationships between the active source area (target area) and the downwind PM_{10} monitor. For example, the screening criteria will exclude hours when a PM_{10} monitor site is located on the edge of a dust plume. Because the edge of a dust plume has a very high concentration gradient, a few degrees error in the plume direction could greatly affect the calculated K-factor.

The following criteria will be used to screen the hourly K-factors:

<u>Initial K-factor Screen</u>

1) Wind speed is greater than 5 m/s at 10 m height at any network site.

2) Hourly modeled and monitored PM_{10} concentrations were both greater than 150 µg/m^3 at the same monitor-receptor site.

3) Hourly wind direction as listed in Table 5.1 for each monitor site.

4) The mean sand flux for all sites with non-zero sand flux is greater than 0.5 g/cm^2/hr.

<u>Final K-factor Screen</u>

5) At least one sand flux site located within the target area and within a 30-degree upwind cone has sand flux greater than 2 g/cm^2/hr.

6) All sources are within a distance of 15 km of the receptor.

7) More than 65 percent of the PM_{10} contribution at a monitor site came from the target source area (North Area, South Area, Central Area or Keeler dunes).

8) Eliminate hours when sand flux data are missing from one or more cells that are located within a 30-degree upwind cone and within 10 km of the shoreline monitor. For Olancha and Lone Pine, which are both located 5 to 10 km from the lake bed, the distance limitation is changed to 10 km upwind of the shoreline.

Table 5.1 Wind Directions for the Initial K-factor Screen

PM_{10} Monitor Site	From-the-Lake Wind Dir. (Deg.)	Met Tower
Lone Pine	110≤WD≤190	Lone Pine
Keeler	130≤WD≤330	Keeler
Flat Rock	210≤WD≤360	Flat Rock
Shell Cut	WD≥210 or WD≤50	Shell Cut
Dirty Socks	WD≥220 or WD≤65	Dirty Socks
Olancha	WD≥320 or WD≤55	Olancha
Bill Stanley	50≤WD≤190	Bill Stanley
New Sites	TBD	TBD

The from-the-lake wind directions for the initial K-factor screening criterion 3) are shown in Table 5.1. From-the-lake wind directions for any new PM_{10} sites will be determined by the APCO as needed for the initial K-factor screen. Note that 'From-the-Lake' wind directions for assessing the lake bed impacts at PM_{10} monitor sites (see 2008 SIP) are different from these K-factor screening wind directions.

Hourly K-factors that pass through the screening criteria will be used to develop new event-specific spatial K-factors, and new 75-percentile hourly average temporal and spatial K-factors, if enough K-factors are available.

5.3 Temporal and Spatial Event-specific K-factors

5.3.1 Event-Specific K-factors

Screened hourly K-factors will be used to generate event-specific K-factors for the active source areas. The event-specific K-factor will be calculated as the arithmetic average using all the hours when the hourly K-factor passes the screening criteria for the target area.

5.3.2 Temporal & Spatial 75-Percentile K-factors

The statistical 75-percentile value will be determined from the distribution of the hourly K-factors that pass the screening criteria for that area and period, whenever there are nine or more hourly K-factors. The 75^{th} percentile will be calculated using the Microsoft Excel PERCENTILE function. The Microsoft Excel PERCENTILE function works by sorting values from lowest to highest, then assigns the 0^{th} percentile is the lowest value, the 100^{th} percentile is the largest value, and the values in between as (k-1)/(n-1) where n is the number of data values in the list and k is index of the k^{th} lowest value in the list. Thus, each value is placed 1/(n-1) apart. If a requested percentile does not lie on a 1/(n-1) step, then the PERCENTILE function linearly interpolates between the neighboring values.

5.3.3 Default K-factors

Table 5.2 shows the default K-factors for each of the K-factor areas and periods. These K-factors are derived for the temporal and spatial 75-percentile values from the screened hourly K-factors for the 30-month Dust ID period used for the RSIP. Each of the two temporal periods combines hourly K-factors from the same calendar periods for 2 or 3 years.

Table 5.2 - Default Spatial and Temporal K-factors for the Dust ID Model

AREA	K-factor Jan.– Apr. & Dec.	K-factor May-Nov.
Keeler Dunes	7.4×10^{-5}	6.0×10^{-5}
North Area	3.9×10^{-5}	1.5×10^{-5}
Central Area	$12. \times 10^{-5}$	6.9×10^{-5}
South Area	4.0×10^{-5}	1.9×10^{-5}

6. Protocol For Dispersion Modeling

This section of the *Protocol* discusses the dispersion model methods planned for the simulation of wind blown dust at Owens Lake using data from the Dust ID Program. The modeling procedures follow the methods used in the RSIP, with refinements based on experience and modifications to support the provisions of the SCR. The modeling techniques will be used both diagnostically to infer emission rates for source areas and prognostically to predict PM_{10} concentrations at the historic shoreline. Following an overview of the modeling approach, the remainder of this section discusses construction of the meteorological data set, dispersion model options, background concentrations and source area characterization.

6.1 Overview of Modeling Procedures and Rationale for Model Selection

The CALPUFF modeling system was used in the RSIP and has been selected for continuing studies in the Dust ID Program. CALPUFF is the USEPA recommended modeling approach for long-range transport studies and USEPA has proposed CALPUFF as a *Guideline Model* to be included in the *Guideline on Air Quality Models* (40 CFR Part 51, Appendix W). Recently the modeling system is also being applied to near-field dispersion problems where the three-dimensional qualities of the wind field are important and for stagnation episodes when pollutants remain within the modeling domain over periods of several hours or more. Dust events on Owen Lake are sometimes influenced by complex wind patterns, with plumes from the North Sand Sheet traveling in different directions than plumes from the South Sand Sheet.

The proposed model domain shown in Figure 6.1 includes a 34 km-by-48 km area centered on Owens Lake. The meteorological and computational grid will use a one-kilometer horizontal mesh size with ten vertical levels extending from the surface to four kilometers aloft. The extent of the model domain was selected to include the "data rich" Dust ID Program study area, terrain features that act to channel winds, and receptor areas of interest. This same model domain and mesh size were used in the simulations supporting the RSIP.

6.2 Meteorological Data Set Construction

Three-dimensional wind fields for CALPUFF will be constructed from surface and upper air observations using the CALMET meteorological preprocessor program and the procedures employed in the RSIP. CALMET combines surface observations, upper air observations, terrain elevations, and land use data into the format required by CALPUFF. Winds are adjusted objectively using combinations of both surface and upper air observations according to options specified by the user. In addition to specifying the three-dimensional wind field, CALMET also estimates the boundary layer parameters used to characterize diffusion and deposition by the CALPUFF dispersion model.

6.3 CALPUFF Options and Application

Surface Observations. The necessary surface meteorological data will come from the District's network of ten-meter towers shown in Figure 1.1. The District may also install additional stations to better characterize winds near suspect source areas not currently near an existing site. Very few periods of missing data are typically contained in the District's database. Periods of missing data will be flagged and CALMET will construct the wind fields using the data from the remaining stations. In addition to the District's network, surface data from other field programs at Owens Lake will be used when available.

Cloud Cover Data. The current version of CALMET also requires cloud cover and ceiling height observations. Cloud cover is a variable used by CALMET to estimate the surface energy fluxes and, along with ceiling height, is used to calculate the Pasquill stability class. Hourly cloud cover and ceiling height observations are being collected from the surrounding surface airways observations at China Lake and Bishop Airport. During dust event conditions, the sensitivity of the CALPUFF modeling system to these variables is reduced, as the stability class becomes neutral under moderate to high winds. Algorithms within the modeling system that depend on the surface energy fluxes are dominated by the momentum flux and tend to be insensitive to cloud cover under high winds. For these reasons, the absence of local cloud cover and ceiling height measurements are not expected to significantly affect the results of the modeling study.

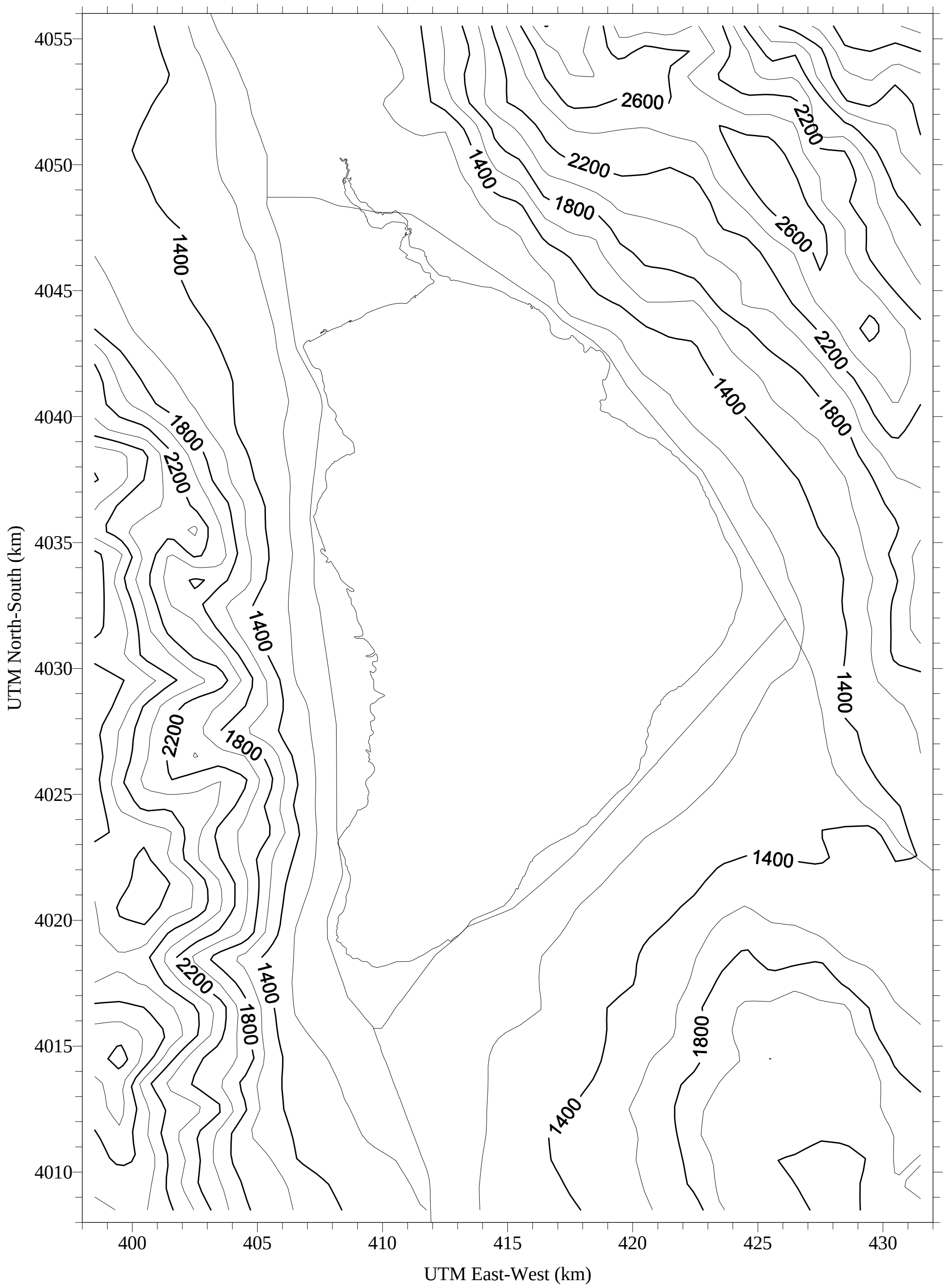

Figure 6.1 - Model Domain, elevation contours and UTM coordinates for the Dust ID Model

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Surface Characteristics and Terrain. The CALPUFF modeling system requires land use and terrain data. These data are used by CALMET to adjust the wind field and affect the calculations performed by the CALPUFF dispersion model. CALPUFF considers spatial changes in land use, including the surface roughness, and the input data are specified on a horizontal grid. The terrain data influence the constructed wind fields and plume trajectories in regions of sparse observations. Land use and terrain data have been obtained from the U.S. Geological Survey (USGS) data sets on the Internet. The resolution of these land use and terrain data sets are 200 m and about 30 m, respectively. The District has prepared these data sets using the pre-processing software provided with the CALPUFF modeling system. The resulting grids have been plotted and checked against data from the District's GIS database where the modeling domain overlaps the District's data. The 1-km mesh size terrain used by CALMET and CALPUFF is shown in Figure 6.1.

Upper air data. Upper air data will be collected from a number of different sources for construction of the wind fields and estimation of mixing heights with CALMET. In the RSIP, both local and regional data were collected as follows:

- A 915 MHz Radar Wind Profiler and Radio Acoustic Sounding System (RASS) were used to collect upper level wind and temperature measurements. The Wind Profiler was initially located at Dirty Socks then moved to the Mill Site during the 4th quarter of 2001. The District discontinued measurements with the Wind Profiler on June 30, 2003. The Wind Profiler with RASS samples wind and temperature from 100 m, up to 5000 m with a vertical resolution as low as 60 m depending on the clutter environment, atmospheric scattering conditions, and pulse length. Experience at Owens Lake indicates wind data recovery is sometimes poor above 1000 m due to the dry environment and the RASS data are limited to the lower levels during windy conditions.

- Regional twice-daily upper air soundings from Desert Rock Airport (Mercury, Nevada) and China Lake Naval Air Station.

During high wind events, observations from the Wind Profiler at both the Mill Site and Dirty Socks indicate very little wind speed or wind direction shear with height. Previous CALPUFF simulations suggest concentrations predicted at PM_{10} monitoring sites and at the historical shoreline are not usually influenced by upper level winds because the sources are ground based. The highest impacts occur close to the source areas, and there is very little wind shear during high winds.

Following removal of the Wind Profiler, soundings from China Lake and Desert Rock will be used to construct the data set. The China Lake and Desert Rock sounding will primarily be used for upper level temperature lapse rates. Winds aloft will be based on extrapolation of the surface wind measurements. The default algorithms employed by CALMET based on Similarity Theory often adjust the winds in the wrong direction and predict too much increase in wind speed with height even for very small surface roughness lengths. As an alternative, wind speeds aloft will be adjusted using the empirical results suggested by the previous Wind Profiler measurements. No wind direction turning with height will be assumed except near the Wind Profiler site where the actual data will be used until this program is discontinued.

CALMET options. The options employed for the application of CALMET to construct the wind fields were provided in the "Modeling Protocol" (MFG, 2001). The majority of the selected model options are based on the defaults incorporated in the code by the model author. Notable model options include:

- Ten vertical levels varying geometrically from the surface to 4000 m. The geometric spacing provides better resolution near the surface and the upper limit is high enough to be above the boundary layer height.

- Vertical extrapolation of surface winds aloft using the results of the Wind Profiler studies.

- Less than default smoothing of wind fields. LADWP contractors Air Sciences and Environ suggested less smoothing of the wind fields by CALMET after review of the *Owens Valley PM_{10} Attainment Demonstration Modeling Protocol*.

Wind fields constructed with CALMET will be randomly checked by plotting the resultant fields and the surface observations on a base map. The CALDESK™ software package will also be used to view the CALMET wind fields.

The application of CALPUFF involves the selection of options controlling dispersion. Although the simulations are primarily driven by the meteorological data, emission fluxes, and source characterization, the dispersion options also affect predicted PM_{10} concentrations. The model options used in the RSIP will continue to be used for the Dust ID Program. In this study, the following options will be used for the simulations:

- Dispersion according to the conventional Pasquill-Gifford dispersion curves. Sensitivity tests were also performed by applying CALPUFF with dispersion routines based on Similarity Theory and estimated surface energy fluxes. These tests did not indicate improved performance over the Pasquill-Gifford based simulations.
- Near-field puffs modeled as Gaussian puffs, not elongated "slugs." CALPUFF contains a computation intensive "slug" algorithm for improved representation of plumes when wind directions vary rapidly in time. This option was tested, but did not significantly influence the CALPUFF predictions.
- Consideration of dry deposition and depletion of mass from the plume. The particle size data used will be based on measurements taken within dust plumes on Owens Lake as discussed below.

Dry deposition and subsequent depletion of mass from the dust plumes depend on the particle size distribution. Several field studies have collected particle size distributions within dust plumes at Owens Lake. Based on results from Niemeyer, *et al*. (1999), the CALPUFF simulations will assume a lognormal distribution with a geometric mean diameter of 3.5 µm and a geometric standard deviation of 2.2.

6.4 Background PM_{10} Concentrations

The dispersion model simulations include only wind blown emissions from the source areas with sand flux activity measurements. During high wind events other local and regional sources of fugitive dust can contribute to the PM_{10} concentrations observed at the monitoring locations. In the RSIP a constant background concentration of 20 $\mu g/m^3$ was added to all predictions to account for background sources. The constant background was calculated from the average of the lowest observed PM_{10} concentrations for each dust event when 24-hour PM_{10} concentrations at any of the sites were above 150 $\mu g/m^3$. To avoid including impacts from lake bed dust source areas in the background estimate, the procedures used a simple wind direction filter to exclude hours when the lake bed may have directly influenced observed PM_{10} concentrations. Such hours were removed and daily average background concentrations were recalculated based on the remaining data.

Additional PM_{10} monitors are proposed for installation at Owens Lake. These monitors can be used to measure hourly PM_{10} concentrations upwind from lake bed source areas. Some of these monitors may be representative of regional PM_{10} concentrations and others may be influenced by local sources that may indicate a higher PM_{10} concentration than the regional background level. A method to calculate background concentrations based on upwind monitor concentrations for each modeled-event approved by both the APCO and the General Manager of the LADWP may be developed in the future. Meanwhile, a default background of 20 $\mu g/m^3$ will be added to the model prediction for each receptor location.

6.5 Area Source Characterization

CALPUFF simulations at Owens Lake are sensitive to source configuration. Emissions will be varied hourly according to the methods described in Section 6.6 and dust sources represented as rectangular area sources. CALPUFF contains an area source algorithm that provides numerically precise calculations within and near the area source location. The area source configuration used for the Dust ID model run for the period from July 2002 through June 2003 is shown in Figure 6.2. The paired Sensit and CSC measurements were assumed to be representative of the horizontal sand flux for irregularly shaped source areas near the sand flux site. Field observers determined the size and shape of the source areas based on GPS mapping after the storms, observation maps made during the storms, and physical surface characteristics. All source areas were represented by sand flux measured at a single site that was applied to a series of 250 m x 250 m cells that were configured to conform to the general shape of the source area represented by the sand flux site.

The following general rules are used to characterize and map source areas on the lake bed:

- Actual source boundaries will be used when available to delineate emission sources in the simulations. Actual source boundaries will be determined using a weight-of-evidence approach considering visual observations, GPS mapping, and surface erosive characteristics. Erosive characteristics that might be considered when defining a source boundary include properties of the soil, surface crusting, wetlands, and the proximity of the brine pool and existing DCMs.

- Source boundaries will also be defined based on the DCM locations. For example, sand flux measurements outside the DCM will be assumed to apply up to the boundary of the DCM. Sand flux measurements inside the DCM will be assumed to apply to the area inside the DCM.

- All source areas will be represented by a series of 250 m x 250 m cells that generally conform to the shape of the source area and share the same hourly sand flux rates as the sand flux site representing that source area. Cells small than 250 m x 250 m may be used near the shoreline to better represent source areas where predicted concentrations are expected to be particularly sensitive to the source area configuration. (Figure 6.2)

6.6 Estimation of PM_{10} Emissions

Hourly PM_{10} emissions for each source area will be estimated using Dust ID sand flux data and K-factors following the procedures described in Section 5. See also SCR Section 1.2 and 2.1 regarding the order of priority for using K-factors for modeling.

6.7 Simulation of Shoreline Concentrations

Under the provisions of the SCR in the RSIP, CALPUFF simulations will be used to assess whether lake bed source areas cause or contribute to an exceedance of the PM_{10} NAAQS in areas without PM_{10} monitoring sites. Predictions will be obtained using the RSIP receptor network that contains more than 460 receptor locations placed at the historic shoreline (approximately at the 3600' elevation) of Owens Lake (see Figure 6.2). The receptor spacing along the historic shoreline ranges from 100 to 200 m. Note in several locations along the shoreline, receptors are very close to or even within potential source areas (see Figure 6.3).

7. Owens Lake Safety & Training Program

7.1 Objective

All field personnel that work at Owens Lake are required to complete special training courses to deal with the unique hazards and environmental precautions that must be considered when working on the lake bed. Training includes: first aid and CPR training, proper ATV use, respiratory protection and dust safety, lake bed access reporting, and snowy plover protection.

7.2 Safety Requirements

Safety is the first priority while working at Owens Lake. Training requirements are required for every worker at the lake for their own safety. Dust storms can start within minutes exposing workers to dust and sand. Lightning storms often occur in the summer. Winters have sub-freezing temperatures and summers have temperatures well above 100 degrees. Access is usually restricted to ATV’s and can change often throughout each year. The objective of all the training requirements is to put safety as the highest priority at all times.

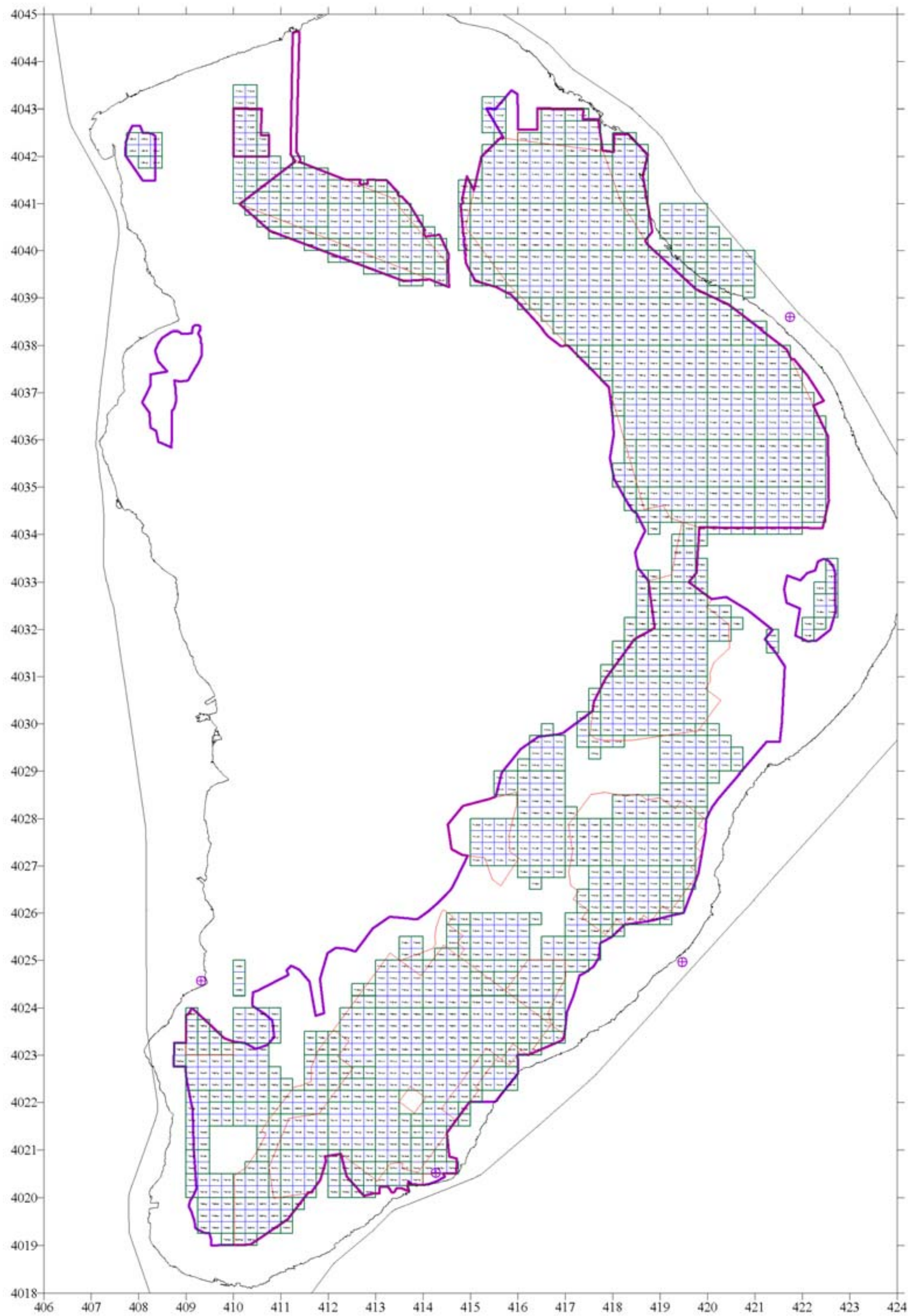

Figure 6.2 - Area source configuration using 250 m x 250 m cells for July 2002 through June 2003 Dust ID model run. Purple lines represent the control area boundary used with the Settlement Agreement.

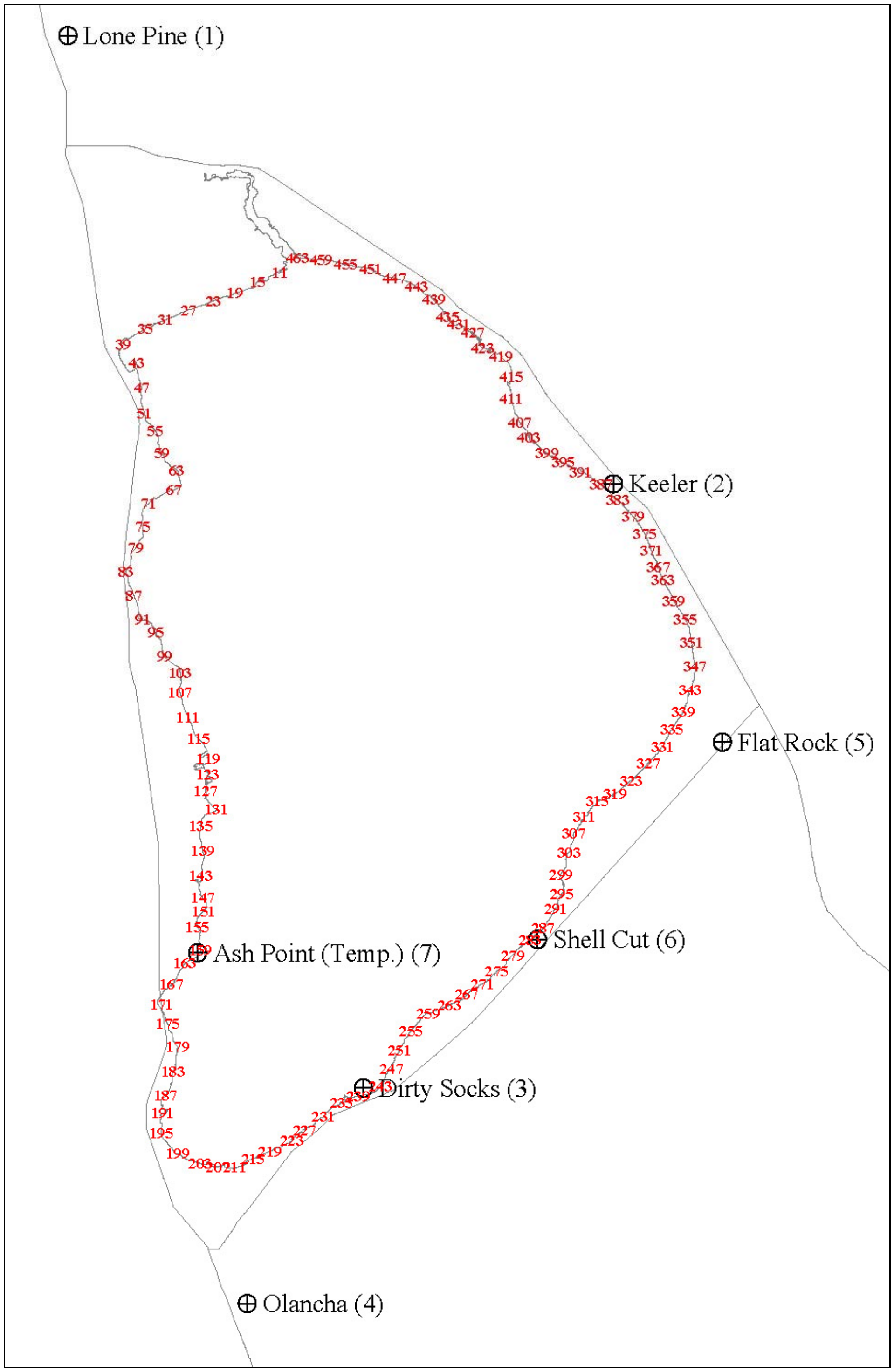

Figure 6.3 -The Dust ID model evaluates PM_{10} impacts at over 460 receptor locations around Owens Lake.

All personnel that are involved with any fieldwork under the Dust ID Program are required to complete all safety training before working on the lake. Everyone must report going onto and leaving the lake. Workers are required to stop work and leave the lake when a dust storm starts. Every field worker will be issued a respirator, goggles for eye protection and earplugs to be used when caught in a dust storm while leaving the lake. Workers are required to leave the Keeler office when the dust impacts Keeler and the TEOM monitor reading exceeds 1000 $\mu g/m^3$. Respirator training and face fits will be completed annually. First Aid and CPR training and successful certification is required every three years. Snowy Plover training is required before any new worker can start work on the lake. Other safety issues that all workers will be informed of include the proper use of tools, special weather conditions such as temperature extremes, rain and lightning and training in the operation of ATVs.

7.3 Reporting Procedure for Working on the Lake and Contacts

1. Normal work hours on the Owens Lake are defined as sunrise to 4:45 PM, Monday through Friday. The lake is defined as any area below the 3600 ft. contour.

2. Every person or group must call the Bishop office and leave a message or speak to the Administrative Specialist (AS) to notify that they are working on the lake. They also must inform the AS what area of the lake they will be working. Examples: DIVIT, Dirty Socks sand sheet, “A” Met tower or any commonly used identifiable name of a site or area you will be working.

3. The AS will record the person’s name (s) and area of the lake they are working on.

4. Every person or group working on the lake must notify the Bishop office before 4:45 PM on the same day; that they have left the lake OK. This must be done or a person will be sent out to look for you! False alerts will not be appreciated.

5. The AS will call the Director of Technical Services (DTS) in Keeler or one of the back up persons in order on the list below, and report the missing person if not notified before the specified time. An attempt will be first made to contact the missing person by phone and determine their situation. The DTS or an assigned person will begin a search for the missing person if the person cannot be contacted by phone. The search will continue until dark or unsafe conditions at which time the Inyo Sheriff will be notified for assistance.

6. Everyone may work outside normal work hours Monday through Friday <u>at your own risk.</u> However, they must call the Bishop office before the designated time and notify the AS that they will be working past 4:45 PM and call again and leave a message that they left the lake OK before 8:00 AM the next day.

7. The AS will check the messages every morning and record the information. The DTS will be notified if a person that worked after normal hours did not call and leave a message that they left the lake OK. The DTS or an assigned person will follow the procedure for a missing person outlined in step 5.

8. Nobody may work on the lake after 4:45 PM on Friday, all day Saturday or Sunday unless they receive special permission from their direct supervisor. The supervisor will be responsible for making sure the worker left the lake OK and responding to an emergency or search if necessary. The worker must notify their supervisor when they leave the lake OK during these periods.

<u>Emergency Assistance Reporting Contacts and Phone Numbers (Area Code 760):</u>

Call 911 first if you have an emergency!

Bishop Office AS	872-8211	
Bill Cox (DTS)	876-8103	Cell 937-2886
Earl Wilson	876-8104	Cell 937-1060
Nik Barbieri	876-1803	Cell 937-6696
Grace Holder	872-8211	Cell 937-2887
Guy Davis	876-8115	Cell 937-1766
Dan Johnson	876-4544	Cell 937-1715
Ted Schade	872-8211	Cell 937-3360

7.4 Snowy Plover Training and Other Wildlife Protection Procedures

Field technicians and other District personnel and contractors are required to take precautions to avoid disturbing western snowy plovers during the nesting and brooding season which is from March 15 through August 30 each year. All lake bed personnel must complete snowy plover awareness and avoidance training before venturing onto the lake bed during snowy plover season. A qualified biologist will provide training for all lake bed personnel. In addition to completing snowy plover training, the plover protection program requires the following:

- Report snowy plover sightings to the District's biological resources monitor for dissemination to all lake bed personnel and for scientific data collection purposes. The biological resources monitor will map and mark the sightings in the case of nesting pairs, and will map the last known locations of broods. Lake bed workers will be responsible for checking the latest maps before encroaching onto potential snowy plover use areas.

- If snowy plover nests are found within areas of potential conflict with Dust ID monitoring, they will be marked in the field with green stakes. Within the buffer area demarked by stakes, the maximum allowable time per visit is 10 minutes.

- Field personnel should use established ATV and 4WD vehicle trails to approach and depart monitoring sites. The maximum allowable speed on ATV and off-road 4WD on the lake bed is 15 mph during the snowy plover season.

All existing and new Dust ID monitoring installations will be fitted with raptor perching deterrent (eg., Nixalite) at potential perch sites with a height of greater than 60 inches above the playa surface. Maintenance of perching deterrents will be routinely performed. Any new construction that causes new ground disturbance during the snowy plover season will require a pre-construction survey for snowy plover use. A qualified biologist will perform the survey within 1 week prior to the start of construction.

Monitoring will be performed on site in a manner that is least disturbing to wildlife and plant resources as possible. Potentially affected upland resources (those located outside the playa) that could be disturbed during any new ground-disturbing construction activities were identified during District environmental analyses. The animals that use upland areas vary seasonally, with nesting and foraging birds, mammals, reptiles, and invertebrates occurring during the period of dust monitoring. No special training is required to work in upland areas during the dust monitoring season, however pre-construction wildlife and rare plant surveys are required if placement of new facilities at any time of year will cause new ground disturbance.

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Board Order 080128-01
Attachment D

2008 Procedure for
Modifying Best Available Control Measures (BACM)
for the Owens Valley Planning Area

The City may transition from one approved BACM to another provided that the performance standard of one or the other BACM is met at all times during the transition, and that the City makes a complete and technically well-supported written demonstration of that performance, with a built-in margin of safety, to the satisfaction of the APCO in advance of any actions by the City to transition. There are three circumstances under which temporary modifications may be allowed to the BACM identified in this SIP, if certain conditions are met. The circumstances are:

1. Adjustments to existing BACM. Research to demonstrate that sufficient PM_{10} control efficiency during the dust season can be achieved and the NAAQS can be attained everywhere on or above the historic shoreline with a different performance standard for an existing BACM.

2. Research on new BACM

3. Transition from one BACM to another that requires a time period where neither BACM's performance standards can be met.

The City may make an application for any of these modifications in writing to the APCO. The complete application must include all necessary data and other technical information to support the application. Except for the specific limitations set forth below for BACM adjustments to Shallow Flooding, the APCO shall have full and sole discretion to accept, reject or condition the City's application for modifications to BACM on Owens Lake, to require additional technical information, and/or to independently monitor the results of the project, and shall provide her/his decision in writing. This same discretion shall apply to the APCO's consideration of each of the other applications that the City may make as further described below. The APCO will consider and respond to comments made by the City regarding any decision by the APCO to reject, condition or modify an application. Failure by the City to comply with any condition of the project approval may result in the APCO revoking the project approval and directing closure procedures be implemented for the project.

The flexible BACM description under the terms of the Order preclude the application of the U.S. Environmental Protection Agency's Natural Events Policy for monitoring data used to make the determinations in this Attachment. All monitored PM_{10} concentrations that meet the EPA quality-assurance requirements contained in 40 CFR Part 58 and are measured at stations located at or no more than 3 kilometers above the historic shoreline (shoreline monitors) will be used in the analysis. The monitored values will be used as measured, and will not be adjusted for from-the-lake and non-lake wind directions as they are for the Supplemental Control Requirements.

The modeling for the determinations will be performed in accordance with the 2008 Owens Lake Dust Source Identification Program Protocol (Board Order 080128-01, Attachment C).

1. ADJUSTMENTS TO EXISTING BACM

A. BACM Adjustments to Shallow Flooding

1. After approval of the 2008 SIP, the City shall have the option to conduct field testing to refine the wetness cover requirement to achieve 99 percent control efficiency in Shallow Flood areas within the boundaries of the 2003 Dust Control Area (Shallow Flood Cover Test).

    A. The Shallow Flood Cover Test shall occur on one or more areas totaling not more than 1.5-square-miles, to be selected by the City and approved by the APCO, which approval shall not be unreasonably withheld, from within the TDCA areas requiring 99 percent control.

    B. The Shallow Flood Cover Test design shall be prepared by the City and approved by the APCO, which approval shall not be unreasonably withheld, prior to implementation. Based on that design, the APCO will reasonably determine wetness cover requirements for the Shallow Flood Cover Test.

    C. The City will be CEQA lead agency for the Shallow Flood Cover Test and shall secure all required responsible agency approvals, permits and leases.

2. If the APCO reasonably determines in writing that the PM_{10} Dust Control Measures in the 2008 Total Dust Control Area (TDCA) have been operational for one continuous year (defined as 365 consecutive days) with no exceedance of the federal standard at monitors located at or above the historic shoreline caused solely by sources within the 2008 TDCA, the City shall be permitted to reduce the wetness cover by an average of 10 percent over those Shallow Flood areas requiring 99 percent control efficiency, excluding areas identified in Section A.2.C, below, provided that:

    A. Application of the 10 percent reduction in wetness cover during the May 16 through June 30 Shallow Flood areal wetness cover reductions provided for in Paragraphs 15.A.ii and 15.B.ii of Board order 080128-01 shall result in the lower of:

        i. The areal cover resulting from a 10 percent reduction; or

        ii. The areal cover required in Paragraphs 15.A.ii and 15.B.ii of Board Order 080128-01.

    B. To implement the reductions set out in this Section, the City shall be required to first submit a written Wetness Cover Plan to the District for reducing the wetness cover on the eligible areas. The Wetness Cover Plan shall take into account:

i. The results of testing carried out pursuant to Section A.1, if conducted; and

ii. The results of fall and spring Shallow Flood wetness cover reduction operations carried out pursuant to Paragraphs 15.A.ii and 15.B.ii of Board Order 080128-01.

C. If, in any year, the Wetness Cover Plan proposes reductions in wetness cover greater than 10 percent in any portion of the Shallow Flood areas covered by the Plan (consistent with the 10 percent limit on the overall average reduction), the City shall obtain the additional written approval of the APCO, which approval shall not be unreasonably withheld.

D. In the event shoreline monitors show an exceedance of the federal standard, whether that exceedance is caused by sources within, outside, or both within and outside of the 2008 TDCA, no further reductions in wetness cover shall be permitted for any Shallow Flood area that has contributed to the exceedance, as determined by the methodology in the "2008 Owens Valley Planning Area Supplemental Control Requirements Procedure" (Attachment B) and subject to the provisions of Section A.4, below.

E. Except as provided in Section A.4, below, the City may continue to operate using reductions of wetness cover pursuant to a previously approved Wetness Cover Plan.

3. For each Dust Control Season (October 1 of each year through June 30 of the next year) that wetness cover reductions have taken place under the provisions of Section A.2, the City shall prepare and submit to the District a written report summarizing the results of the wetness cover reductions within 90 days after conclusion of the corresponding Dust Control Season. The report shall document the percentage of wetness cover for Shallow Flood areas and the effect(s) of wetness cover reductions on PM_{10} concentrations at the historic shoreline.

4. Any areas for which wetness cover has been reduced pursuant to Section A.2 and that cause or contribute to an exceedance of the federal standard at the historic shoreline shall be remediated by the City under the Remedial Action Plan prepared pursuant to the requirements of Attachment B.

A. Subject to APCO written approval, which approval shall not be unreasonably withheld, the City may further reduce the wetness cover beyond that allowed in Section A.2 provided that:

i. The maximum 24-hour PM_{10} shoreline monitor values for at least 365 consecutive days of operation following initiation of the last approved Wetness Cover Plan does not exceed 130 $\mu g/m^3$; and

ii. The City demonstrates to the reasonable satisfaction of the APCO that the modeled contributions from the lake bed for the same time period set forth in

Section A.4.A.(i) plus the background of 20 µg/m^3 do not exceed 120 µg/m^3 at the historic shoreline.

B. If the monitored values at the historic shoreline exceed 130 µg/m^3, and it is determined that non-lake bed sources are contributing greater than 20 µg/m^3, then the District will expeditiously seek to identify and require control of those non-lake bed sources so that the City may continue to implement efficient DCMs on the lake bed.

C. If the City is entitled to further reduce wetness cover pursuant to this Section, the City shall prepare and submit an updated Wetness Cover Plan to the District to describe the wetness cover proposed for the subsequent, applicable Dust Control Season. The updated Wetness Cover Plan shall include:

   i. A map that depicts the eligible Shallow Flood areas;

   ii. The proposed amount of wetness cover for each eligible Shallow Flood area; and

   iii. The method for determining effectiveness of the proposed wetness cover.

D. The Wetness Cover Plan shall be subject to approval of the APCO, which approval shall not be unreasonably withheld.

B. BACM Adjustment to Measures Other than Shallow Flooding within Existing Dust Control Areas

<u>Requirements to Begin the Process</u>

At least once per calendar year after May 1, 2010, the District's APCO will make a written determination as to whether the Owens Lake bed will require additional PM_{10} controls in order to attain or maintain the federal 24-hour PM_{10} NAAQS. The APCO will use the procedure forth in Board Order 080128-01 to make the determination.

If the APCO determines that there were no monitored or modeled exceedances of the PM_{10} NAAQS as described above for the previous calendar year, each calendar year the APCO will do the following:

1) determine from the modeling if there are shoreline receptors where the model shows the combined predicted yearly maximum 24-hour contribution from all source areas on the lake bed contributing to those receptors plus background (24-hour average of 20 µg/m^3) is less than 120 µg/m^3, and

2) determine that there were no concentrations greater than 120 µg/m^3 measured at any shoreline or near-shore monitoring site in the area of those receptors.

The City may perform an independent assessment using the data and methods of the Dust ID Protocol in order to confirm the APCO's findings. The APCO will consider and respond to the

City's assessment before making his/her final determination. The APCO has full and sole discretion to make this determination.

First Step on Test Areas

If there are receptors that meet the requirements described above, and provided that the City is in compliance with SIP control requirements on all areas of the lake bed, the APCO will inform the City that they may submit an application to reduce the level of control within a 1 to 2-square-mile test area of an existing Shallow Flooding Dust Control Measure (DCM) area or within a 160 to 320 acre test area of an existing Managed Vegetation DCM area that the modeling shows contributes to, and only to, the shoreline receptors described above where the yearly maximum 24-hour contribution from the lake bed plus background is less than 120 $\mu g/m^3$. Application may be made for more than one area to be tested simultaneously provided the test areas do not impact any of the same modeled shoreline receptors or monitors (no overlapping impacts). The above limitations on test area size and location do not apply outside the boundaries of existing Dust Control Areas.

For the Managed Vegetation DCM, the cover may be reduced by no more than 5%, e.g. 50% to 45%, (one step). For other BACM or changes to compliance averaging areas (e.g., one acre for Managed Vegetation), the APCO will determine the permitted test area size, averaging area, test location and step amount. An area with a non-zero contribution to a receptor will be considered not to contribute to a receptor if the contribution from that area is less than 5 $\mu g/m^3$ and the yearly maximum 24-hour contribution from the lake bed plus background (20 $\mu g/m^3$) to that receptor is less then 140 $\mu g/m^3$. (A "zero contribution" is defined by the accuracy of the instruments used to collect the data, but in no case shall it be greater than 1 $\mu g/m^3$.) The City may also satisfy the requirements of a BACM test for Managed Vegetation with documentation of a site-specific BACM test, along with written justification for more general application of the results of this test.

The City's application to reduce the level of control over any area within the boundaries of existing Dust Control Areas must be accompanied by a modeling analysis that demonstrates that increasing PM_{10} emissions within the test area will not cause the predicted yearly maximum 24-hour concentrations along the shoreline to exceed 120 $\mu g/m^3$, including background (20 $\mu g/m^3$).

The application must also include, but is not limited to:

1) a project description,
2) site plan,
3) any necessary environmental documentation, responsible agency approvals, permits and leases,
4) a protocol to measure PM_{10} emissions and performance standards,
5) a time frame for project milestones and completion,
6) plans to control PM_{10} emissions if they exceed project limits,
7) project closure procedures if the project is discontinued,
8) soil texture information, soil chemistry, groundwater chemistry and applied water chemistry, and

9) a protocol to evaluate control effectiveness, estimate emissions and determine whether the results are transferable to other areas of the lake bed.

For BACM other than Shallow Flooding, the City will submit a relationship between control efficiency and performance standards based upon research results. The APCO has full and sole discretion to accept, reject, or modify that relationship. All modeling will be done according to the Dust ID Protocol.

Rectified aerial or satellite images of the area of adjusted BACM, or any other method approved by the APCO, will be used by the APCO to determine the performance standards for the adjusted BACM for this step and all subsequent steps.

All raw data must be shared with the APCO, and all data screening criteria must be approved (or disapproved) in writing by the APCO. The APCO may terminate the test at any time if modeling or monitoring show that modeled (including background of 20 μg/m^3) or monitored emissions are increasing above trigger levels set by the APCO based upon a 140 μg/m^3 modeled or monitored PM_{10} concentration at the shoreline, or if the City is not following the APCO-approved protocol. The APCO has full and sole discretion to determine whether these conditions have been met.

The APCO has full and sole discretion to approve or reject the City's application or require conditions. The APCO will take action and notify the City in writing within 90 days of receipt of the written application. No changes may be made to BACM in advance of the APCO's approval. Any adjustments to BACM will be reported to EPA by the APCO within 60 days of the APCO's approval.

Subsequent Steps on Test Areas

The adjusted BACM shall be maintained by the City for one year. No other adjustments to BACM may be made during that year that impact any of the same set of model shoreline receptors. At the end of the year, the City may submit a new application to the APCO to reduce the level of control in the test area by another step provided:

1) the modeled yearly maximum 24-hour contribution at all of the shoreline receptors identified above from all lake bed sources including the test area, plus background (20 μg/m^3), during the test period is less than 120 μg/m^3, and

2) no concentrations greater than 120 μg/m^3 were measured at any shoreline monitor in the area of those receptors during the test period.

The new application must contain all the same elements as the original application, and all the data and modeling from the first step of the test.

The APCO has full and sole discretion to approve or reject the City's application, or to require conditions. Subsequent steps may be made in the same manner. The APCO will take action and notify the City in writing within 90 days of receipt of the written application.

Requirement to Increase Controls on Test Areas

If, at the end of the year or any subsequent year before the SIP Revision to adjust BACM is approved by USEPA, the predicted yearly maximum 24-hour contribution from all lake bed sources including the test area plus background (20 $\mu g/m^3$) exceeds 140 $\mu g/m^3$ at any of the shoreline receptors identified above, and/or concentrations greater than 140 $\mu g/m^3$ were measured at a shoreline monitor in the area of the identified receptors, then the City must increase the control efficiency on the test area to the last step that achieved concentrations below the 140-$\mu g/m^3$ threshold. For Managed Vegetation, this action must be taken within 12 months of the written determination by the APCO that the requirements for adjusting BACM were not met. For all other PM_{10} control measures, this action must be taken within 60 days of the written determination by the APCO that the requirements for adjusting BACM were not met. The APCO has full and sole discretion to make that determination. The APCO will determine the time scale for compliance for other BACM as part of the approval of the application.

SIP Revision for BACM for the Test Area

After three consecutive years of successful operation of the adjusted-BACM test area (modeled and monitored concentrations less than 140 $\mu g/m^3$ as described above), the City may apply to the District for a SIP Revision to redefine BACM for that test area on the Owens Lake bed provided:

1) the predicted yearly maximum 24-hour PM_{10} contribution for each year of the test from the test area plus background (20 $\mu g/m^3$) at all shoreline receptors is 140 $\mu g/m^3$ or less, and

2) no PM_{10} concentrations greater than 140 $\mu g/m^3$ were measured at any shoreline monitor during the three years of the test.

The APCO has full and sole discretion to determine whether these conditions have been met. After public notice and comment and a public hearing, the District Board has full and sole discretion to determine whether to adopt the SIP revision.

Lake-Wide SIP Revision for BACM for a Soil Type

If, after three consecutive years of successful operation of the adjusted-BACM test area, the predicted yearly maximum 24-hour contribution from the test area and all source areas on the lake bed plus background (20 $\mu g/m^3$) at all shoreline receptors for all three years of the test is 140 $\mu g/m^3$ or less and no concentrations greater than 140 $\mu g/m^3$ were measured at any shoreline monitor during the three years of the test, the research conducted on these test areas can be used to determine the relationship between the PM_{10} emissions, control efficiency and DCM performance standards. After the relationship has been identified, the City will use the research results in an updated modeling analysis that applies the test results to other areas on the lake bed with the same general soil type (sand-dominated, silt-dominated or clay-dominated) and under the same range of evaluated emissions or control efficiencies and performance standards as the test. The modeling will cover the entire test period, and will be done in accordance with the Dust ID Protocol. A DCM control map (map) will be prepared of lake bed control efficiencies (with corresponding DCM performance standards) that would be required to achieve the PM_{10} NAAQS everywhere along the historic shoreline with that DCM in the same general soil type (sand-dominated, silt dominated or clay-dominated) as the test area and under the same range of control efficiencies, emissions, and performance standards evaluated in the test.

The City will then submit this draft map to the APCO for approval. The submittal must contain all the data from the test area and the modeling that produced the map. The APCO has full and sole discretion to approve, disapprove, or modify the draft map.

If the APCO approves the map, the City may apply to the District Board for a SIP Revision to redefine that BACM for that mapped area on the Owens Lake bed. After public notice and comment and a public hearing, the District Board has full and sole discretion to determine whether to adopt the SIP Revision. If a SIP Revision identifying a redefined BACM for Owens Lake is adopted by the District Board and approved by USEPA, the redefined BACM may be implemented anywhere designated by the new DCM control map. If the City has implemented a different DCM in the mapped area, the requirements of the following section below titled "Transitioning From One BACM to Another BACM After 2010" must also be met. If any modeled or monitored exceedance of the PM_{10} NAAQS results from these adjustments to BACM, the requirements of Board Order 080128-01, Paragraphs 10 and 11, will automatically apply to increase controls on these extreme violators to restore attainment of the NAAQS.

As many of the existing and potential dust control areas on the Owens Lake bed fall under the jurisdiction of the California State Lands Commission and other responsible agencies, the City must secure the appropriate approvals, leases and permits prior to implementing adjustments to existing BACM. However, nothing in this section is intended to give any responsible agency any authority beyond their authority under law.

2. RESEARCH ON POTENTIAL NEW BACM   INCLUDING MOAT   ROW

The City may test new dust control measures at any time on areas of the lake bed that are emissive, except within the 43.0 square-mile 2008 Total Dust Control Area footprint where BACM (or on up to 3.5 square miles, the non-BACM dust control known as Moat & Row) must be implemented by April 1, 2010 or within any Supplemental Control Area where existing BACM has been implemented or is scheduled for implementation. This testing area exclusion does not apply to Moat & Row PM_{10} controls constructed within the 12.7 square-mile 2006 Supplemental Dust Control Area (SDCA). The City may test up to 3.5 square miles of Moat & Row within the SDCA. If the City has tested a new control measure for three years in this manner, it may apply in writing to the APCO for a SIP Revision to designate the new dust control measure as BACM. The application must meet all USEPA requirements for BACM designation and demonstrate to the APCO's satisfaction that the new control measure is sufficient to achieve the required PM_{10} emission reductions or control efficiency during the dust season and attain the NAAQS everywhere on the shoreline. The APCO has full and sole discretion to determine whether these conditions have been met.

The application shall include, but not be limited to:

1) a description of the new dust control measure

2) a description of the test site and the meteorological conditions under which it was tested
3) the measured PM_{10} emissions during the test
4) the test time frame
5) all raw data collected during the test
6) all data screening criteria and final data sets
7) data supporting the conclusion that the required control efficiency was achieved
8) a performance standard that the new dust control measure must meet in order to achieve the required emission reductions or control efficiency
9) an analysis of any environmental impacts of the dust control measure
10) the appropriate responsible agency approvals, permits and leases

The application must include modeling that demonstrates that the required PM_{10} emission reductions or control efficiency can be achieved during the dust season anywhere this control measure may be implemented on Owens Lake, and the NAAQS can be met at all times everywhere along the historic shoreline.

If the APCO determines that the application is complete and the above conditions have been met, he/she will have full discretion to select or approve a method of determining compliance of the proposed new BACM with its performance standard and include that method in the description of the proposed BACM for the SIP Revision. The District Governing Board has full and sole discretion to determine whether to adopt a SIP Revision for approval of any new BACM.

Upon adoption by the District Board, approval by CARB, and submission to USEPA of a SIP Revision that identifies a new BACM for Owens Lake, the City may implement only this one new control measure on one-half square mile of the next area to be identified as needing control under the 2003 SIP Revision Supplemental Control Requirements until EPA approves this new measure as BACM. No other new control measures may be implemented on areas identified as needing control under the 2003 SIP Revision Supplemental Control Requirements until EPA approves this new measure as BACM. The District Governing Board may limit the new BACM to specific circumstances, for example, distance of the new dust control measure from the shoreline or approval in a specific general soil type. Upon approval by USEPA, the new BACM may be implemented per the requirements described in the following section, “Transitioning From One BACM to Another BACM After 2010,” or on any subsequent areas requiring control under the “2008 Owens Valley Planning Area Supplemental Control Requirements Procedure” (Board Order 080128-01, Attachment B), subject to any limitation to specific circumstances.

As many of the existing and potential dust control areas on the Owens Lake bed fall under the jurisdiction of the California State Lands Commission and other responsible agencies, the City must secure the appropriate approvals, leases and permits prior to implementing any BACM test or new BACM. However, nothing in this section is intended to give any responsible agency any authority beyond their authority under law.

3. TRANSITIONING FROM ONE BACM TO ANOTHER BACM AFTER 2010

If the City wishes to transition from one existing BACM to another existing BACM without meeting the performance standard of one or the other BACM at all times, it may submit an application to the APCO in writing for permission to do so after April 1, 2010. The APCO has full and sole discretion to accept, reject or condition the City's application. The transition may be done on no more than one and one-half (1.5) square miles lake-wide for any BACM except Managed Vegetation, or 320 acres lake-wide if the transition is to Managed Vegetation, at one time. The City shall not begin the transition in advance of the APCO's written approval.

The application shall include, but not be limited to:

1) a protocol that includes a project description
2) a site plan
3) a plan to measure PM_{10} emissions
4) a time frame for project milestones and completion
5) plans to control PM_{10} if emissions exceed any trigger value set by the APCO based upon a 140$\mu g/m^3$ modeled (including background of 20$\mu g/m^3$) or monitored PM_{10} concentration at the shoreline
6) data supporting the assumption that the transition can be completed and the BACM performance standards can be achieved within three years of the start-up of construction
7) project closure procedures if the project is discontinued for any reason or if the PM_{10} trigger value is exceeded
8) any necessary environmental documentation, responsible agency approvals, permits and leases

The protocol must include modeling in accordance with the Dust ID Protocol that predicts that the NAAQS will be met at all times everywhere on the shoreline during the transition period, and must include a method to monitor emissions continuously throughout the transition period. The transition must be complete, and the new BACM performance standard achieved, within three years of written notification from the City to the APCO that they are no longer maintaining the performance standard for the existing BACM, and are beginning the transition.

All raw data must be shared with the APCO, and all data screening criteria must be approved (or disapproved) in writing by the APCO. The APCO may terminate the transition at any time if modeling or monitoring show that emissions are increasing above any pre-set trigger level described in 5) above, or if the City is not following the APCO-approved protocol. The APCO has full and sole discretion to determine whether these conditions have been met.

If the data show to the APCO's satisfaction that the transition has been accomplished while attaining the NAAQS everywhere at the shoreline, the City may submit an application to the APCO to allow another area to be transitioned. The APCO has full and sole discretion to accept, reject or condition the City's application. The same procedures outlined above will apply.

As many of the existing and potential dust control areas on the Owens Lake bed fall under the jurisdiction of the California State Lands Commission and other responsible agencies, the City must secure the appropriate approvals, leases and permits prior to BACM transitions. However, nothing in this section is intended to give any responsible agency any authority beyond their authority under law.

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CHAPTER 9

Summary of References

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Air Sciences, Inc., 2006. Final Report: Managed Vegetation Control Efficiency Study, Owens Dry Lake, California, prepared for the Los Angeles Department of Water & Power, Los Angeles, California, July 2006.

Ayars, 1997. Ayars, James, Reclamation Studies on Owens Lake Bed Soil Using Controlled Flood Irrigation, Prepared for the Great Basin Unified Air Pollution Control District, Bishop, California, May 2, 1997.

Buckley, 1987. Buckley, R., *The Effect of Sparse Vegetation on the Transport of Dune Sand by Wind*, Nature, 325:426-29, 1987.

Caltrans, 2005. California Department of Transportation, California Motor Vehicle Stock, Travel and Fuel Forecast, Sacramento, California, December 30, 2005.

CARB, 1997. Memorandum from Patrick Gaffney to Duane Ono, Re: Owens Valley Emissions Data, California Air Resources Board, Sacramento, California, January 8, 1997.

CARB, 2007a. California Air Resources Board, website for California Emissions Inventory Data, accessed July 25, 2007, http://www.arb.ca.gov/ei/ei.htm.

Chester LabNet, 1996. Chester LabNet - Portland, report on chemical analysis of ambient filters, Report #95-085, prepared for Great Basin Unified Air Pollution Control District, Tigard, Oregon, June 18, 1996.

Chow and Ono, 1992. Chow, Judith, and Duane Ono, eds., PM_{10} Standards and Non-traditional Particulate Source Controls, “Fugitive Emissions Control on Dry Copper Tailings with Crushed Rock Armor,” Air & Waste Management Association, Pittsburgh, Pennsylvania, 1992.

Cox, 1996. Cox, Jr., Bill, Gravel as a Dust Mitigation Measure on Owens Lake, Great Basin Unified Air Pollution Control District, Bishop, California, October 1996.

DeDecker, 1984. DeDecker, Mary, Flora of the Northern Mojave Desert, California, California Native Plant Society Special Publication No. 7, Berkeley, 1984.

Eldridge, 1995. Eldridge, B.F. and K. Lorenzen, Predicting Mosquito Breeding in the Restored Owens Lake, University of California, Davis, California, August 1, 1995.

Federal Register, 1999. Approval and Promulgation of Implementation Plans: California – Owens Valley Nonattainment Area; PM_{10}, Federal Register, Volume 64, No. 171, pp. 48305-48307, September 3, 1999.

Fryrear, 1994. Fryrear, Donald W., letter from U.S. Department of Agriculture, Agricultural Research Service, to Ellen Hardebeck, Great Basin Unified Air Pollution Control District, Bishop, California, July 22, 1994.

GBUAPCD, 1987. Great Basin Unified Air Pollution Control District, Adopted Toxic Risk Assessment Policy, GBUAPCD, Bishop, California, 1987.

GBUAPCD, 1988. Great Basin Unified Air Pollution Control District, State Implementation Plan and Negative Declaration/Initial Study for Owens Valley PM_{10} Planning Area, GBUAPCD, Bishop, California, December 1988.

GBUAPCD, 1991. Great Basin Unified Air Pollution Control District, Owens Valley PM_{10} Planning Area State Implementation Plan Addendum, GBUAPCD, Bishop, California, November 1991.

GBUAPCD, 1994. Great Basin Unified Air Pollution Control District, Owens Valley PM_{10} Planning Area Best Available Controls Measures State Implementation Plan, GBUAPCD, Bishop, California, June 1994.

GBUAPCD, 1995. Great Basin Unified Air Pollution Control District, Mono Basin Planning Area PM_{10} State Implementation Plan (Final), GBUAPCD, Bishop, California, May, 1995.

GBUAPCD, 1996. Great Basin Unified Air Pollution Control District, Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Project Alternatives Analysis, GBUAPCD, Bishop, California, October 23, 1996.

GBUAPCD, 1997. Great Basin Unified Air Pollution Control District, Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Final Environmental Impact Report, GBUAPCD, Bishop, California, July 2, 1997.

GBUAPCD, 1998a. Great Basin Unified Air Pollution Control District, Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan, GBUAPCD, Bishop, California, November 16, 1998.

GBUAPCD, 1998b. Great Basin Unified Air Pollution Control District, Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Final Environmental Impact Report Addendum Number 1, GBUAPCD, Bishop, California, November 16, 1998.

GBUAPCD, 2001b. Great Basin Unified Air Pollution Control District, Hydrogeology Archive 2000, electronic publication by the GBUAPCD, compact disk with data and reports on the hydrology and geology of the Owens Lake area, GBUAPCD, Bishop, California, March 29, 2001.

GBUAPCD, 2002a. Great Basin Unified Air Pollution Control District, Saltgrass Meadow Establishment and Maintenance Using Flood Irrigation: Lawrence Clay soil at Owens Lake, California (Draft), GBUAPCD, Bishop, California, 2002.

GBUAPCD, 2002c. Great Basin Unified Air Pollution Control District, Meadow Establishment and Maintenance on the North Sand Sheet at Owens Lake, 1994-2001 (Draft), GBUAPCD, Bishop, California, 2002.

GBUAPCD, 2003. Great Basin Unified Air Pollution Control District, Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan - 2003 Revision, GBUAPCD, Bishop, California, November 13, 2003.

GBUPACD, 2003c. Great Basin Unified Air Pollution Control District, 2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Draft Environmental Impact Report, State Clearing House Number 2002111020, GBUAPCD, Bishop, California, July 11, 2003.

GBUAPCD, 2003g. Great Basin Unified Air Pollution Control District, 2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Final Integrated Environmental Impact Report, State Clearing House Number 2002111020, GBUAPCD, Bishop, California, February 2004.

GBUAPCD, 2005. Great Basin Unified Air Pollution Control District, Inyo National Forest, USDI Bureau of Land Management, Operations Plan for Wildland Fire Use Smoke Management, GBUAPCD, Bishop, California, May 2, 2005.

GBUAPCD, 2006b. Great Basin Unified Air Pollution Control District, Settlement Agreement between the District and the City to resolve the City's challenge to the District's Supplemental Control Requirement determination issued on December 21, 2005 and modified on April 4, 2006, GBUAPCD, Bishop, California, December 4, 2006.

GBUAPCD, 2007a. Great Basin Unified Air Pollution Control District, Owens Lake Dust ID Field Manual, GBUAPCD, Bishop, California, Draft: January 24, 2007.

GBUAPCD, 2007b. Great Basin Unified Air Pollution Control District, 2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Draft Subsequent Environmental Impact Report, State Clearing House Number 2007021127, GBUAPCD, Bishop, California**,** September 14, 2007.

Gillette, *et al*., 2004. Gillette, Dale, Duane Ono, Ken Richmond, *A Combined Modeling and Measurement Technique for Estimating Wind-Blown Dust Emissions at Owens (dry) Lake*, *CA*, Journal of Geophysical Research, Volume 109, January 17, 2004.

Grantz, *et al.*, 1995. Grantz, David, David Vaughn, Rob Farber, Mel Zeldin, Earl Roberts, Lowell Ashbough, John Watson, Bob Dean, Patti Novak, Rich Campbell, Stabilizing Fugitive Dust Emissions in the Antelope Valley from Abandoned Farmland and Overgrazing, *A&WMA's 88th Annual Conference & Exhibition*, June 1995, San Antonio, Texas, Paper #95-MP12.04, Air & Waste Management Association, Pittsburgh, Pennsylvania, June 1995.

Groeneveld, 2002. Groeneveld, David G., A Remote Sensing Approach to Monitoring Owens Lake Mitigation, prepared for Great Basin Unified Air Pollution Control District by HydroBio, Santa Fe, New Mexico, 2002.

Hardebeck, *et al.*, 1996. Hardebeck, Ellen, Grace Holder, Duane Ono, Jim Parker, Theodore Schade and Carla Scheidlinger, Feasibility and Cost-Effectiveness of Flood Irrigation for the Reduction of Sand Motion and PM_{10} on the Owens Dry Lake, Great Basin Unified Air Pollution Control District, Bishop, California, 1996.

Heindel and Heindel, 1995. Heindel T., and J. Heindel, "Birds" in Putnam, J. and G. Smith, eds. Deepest Valley: Guide to Owens Valley, Mammoth Lakes, California, Genny Smith Press, 1995.

Holder, 1997. Holder, Grace M., Off-Lake Dust Sources, Owens Lake Basin, Great Basin Unified Air Pollution Control District, Bishop, California, June 1997.

Hopkins, 1997. Hopkins, Ross, letter from National Park Service, Manzanar National Historic Site, Superintendent, to Ellen Hardebeck, Great Basin Unified Air Pollution Control District, regarding the Owens Lake air pollution problem, January 3, 1997.

HydroBio, 2007. HydroBio, Inc., Bibliographic Summary of Owens Lake Dust Control Measure Compliance Reports and Supporting Documentation, Santa Fe, New Mexico, September 2007.

Keisler, 1997. Keisler, Mark, memorandum from Great Basin Unified Air Pollution Control District, to Duane Ono, GBUAPCD, regarding crop acreage for Southern Inyo County, GBUAPCD, Bishop, California, March 1997.

Kiddoo, *et al.*, 2007. Kidoo, Phill, Jim Parker, Duane Ono, Off-Lake PM_{10} Exceedances at Owens Lake, January 1, 2000 – June 30, 2007.

LADWP, 1966. Los Angeles Department of Water and Power, Record of means and totals, unpublished data base, 1966.

LADWP, 2000. Los Angeles Department of Water and Power, Mitigated Negative Declaration, North Sand Sheet Shallow Flooding Project, Owens Lake Dust Mitigation Program, Owens Lake, California, Los Angeles, California, April 2000.

LADWP, 2001. Los Angeles Department of Water and Power, Mitigated Negative Declaration, Southern Zones Dust Control Project, Owens Lake Dust Mitigation Program, Owens Lake, California, Los Angeles, California, September 2001.

LADWP, Bamossy, 2007. Personal Communication between Theodore Schade, GBUAPCD and Wayne Bamossy, Los Angeles Department of Water and Power, July 24, 2007.

LADWP, Harasick, 2007. LADWP Comments on Screen Check of Draft 2008 SIP. Transmitted to T.D. Schade by Richard Harasick via e-mail on August 31, 2007, hardcopy dated September 10, 2007.

Lancaster, 1996. Lancaster, Nicholas, Field Studies to Determine the Vegetation Cover Required to Suppress Sand and Dust Transport at Owens Lake, Desert Research Institute, Reno, Nevada, July 1996.

Lee, 1915. Lee, C.H., Report on Hydrology of Owens Lake Basin and the Natural Soda Industry as Effected by the Los Angeles Aqueduct Diversion, Los Angeles Department of Water and Power internal report, Los Angeles, California, 1915.

McKee, 1996. McKee, Lucinda, letter from U.S. Department of Agriculture-Forest Service, to Duane Ono, Great Basin Unified Air Pollution Control District, regarding historic smoke emissions for inclusion in the State Implementation Plans for Owens Valley, Mammoth Lakes and Mono Basin, Bishop, California, June 13, 1996.

Mihevc, *et al*., 1997. Mihevc, Todd M., Gilbert F. Cochran, and Mary Hall, Simulation of Owens Lake Water Levels, report prepared for Great Basin Unified Air Pollution Control District, Bishop, California, by Desert Research Institute, Reno, Nevada, June 1997.

Murphy, 1997. Murphy, Timothy P., memorandum from Great Basin Unified Air Pollution Control District Soil Scientist to Mark Kiesler, GBUAPCD, regarding silt analysis results for unpaved road surfaces in Keeler and the Cerro Gordo Road, GBUAPCD, Bishop, California, January 14, 1997.

Musick & Gillette, 1990. Musick, H.B. and D.A. Gillette, *Field Evaluation of Relationships between a Vegetation Structural Parameter and Sheltering Against Wind Erosion*, Journal of Land Degradation and Rehabilitation, December 1990.

Nickling, *et al.*, 1997. Nickling, William G., Nicholas Lancaster, and John Gillies, Field Wind Tunnel Studies of Relations Between Vegetation Cover and Dust Emissions at Owens Lake, an interim report prepared for the Great Basin Unified Air Pollution Control District, University of Guelph, Ontario, Canada, and Desert Research Institute, Reno, Nevada, May 8, 1997.

Niemeyer, 1996. Niemeyer, Tezz C., Characterization of Source Areas, Size and Emission Rates for Owens Lake, CA: Fall 1995 through June 1996, Environmental Consulting, Olancha, California, November 1996.

Niemeyer, *et al*., 1999. Niemeyer, T.C., D.A. Gillette, J.J. Deluisi, Y.J. Kim, W.F. Niemeyer, T. Ley, T.E. Gill, and D. Ono, *Optical Depth, Size Distribution and Flux of Dust from Owens Lake, California*, Earth Surfaces Processes and Landforms, 24: 463-479, 1999.

Nickling, *et al*., 2001. Nickling, W.G., C. Luttmer, D.M. Crawley; J.A. Gillies; and N. Lancaster, Comparison of On- and Off-Lake PM_{10} Dust Emissions at Owens Lake, CA, University of Guelph, Guelph, Ontario, Canada, February 2001.

OEHHA, 2002. Office of Environmental Health Hazard Assessment, Air Toxics Hot Spots Program Risk Assessment Guidelines, Part II, Technical Support Document for Describing Available Cancer Potency Factors, Sacramento, California, December 2002.

Ono, 1997. Ono, Duane, PM_{10} Emission Factors for Owens Lake Based on Portable Wind Tunnel Tests from 1993 through 1995, Great Basin Unified Air Pollution Control District, Bishop, California, January 1997.

Ono, *et al*., 2000. Ono, Duane, Ellen Hardebeck, Jim Parker, B.G. Cox, *Systematic Biases in Measured PM_{10} Values with U.S. Environmental Protection Agency-Approved Samplers at Owens Lake, California,* J.Air & Waste Manage. Assoc., Pittsburgh, PA, 50:1144-1156, July 2000.

Ono, 2002. Ono, Duane, Memo on Owens Lake Background PM_{10} Calculation Method, Great Basin Unified Air Pollution Control District, Bishop, California, September 13, 2002.

Ono, *et al*., 2003a. Ono, Duane, Ellen Hardebeck, Scott Weaver, Billy Cox, Nikolai Barbieri, William Stanley, Ken Richmond, and Dale Gillette, Locating and Quantifying Wind-Blown Dust PM_{10} Emissions at Owens Lake, California, *A&WMA's 96th Annual Conference & Exhibition*, June 2003, San Diego, California, Paper #69487, Air & Waste Management Association, Pittsburgh, Pennsylvania, June 2003.

Ono, et al., 2003b. Ono, Duane, Scott Weaver, Ken Richmond, Quantifying Particulate Matter Emissions from Wind Blown Dust Using Real-time Sand Flux Measurements, *USEPA 2003 Emission Inventory Conference*, April 29-May 1, 2003, San Diego, California, United States Environmental Protection Agency, Research Triangle Park, North Carolina, May 2003.

Ono and Keisler, 1996. Ono, Duane and Mark Keisler, Effect of a Gravel Cover on PM_{10} Emissions from the Owens Lake Playa, Great Basin Unified Air Pollution Control District, Bishop, California, July 1996.

Ono and Richmond, 2007. Duane Ono and Ken Richmond. Air Quality Model Evaluation of the Shallow Flood Ramping Flow Strategy. Great Basin Unified Air Pollution Control District, Bishop, California, September 2007.

Parker, 2003. Parker, James, Comparison of TEOM and Partisol Monitors at Owens Lake, California, Great Basin Unified Air Pollution Control District, June 2003.

Richmond, *et al*., 2003. Richmond, Ken, Duane Ono, Ellen Hardebeck, Scott Weaver, Billy Cox, Nikolai Barbieri, William Stanley,and Dale Gillette, Modeling Wind-Blown Dust Emissions and Demonstrating Attainment with National Ambient Air Quality Standards at Owens Lake, California, *A&WMA's 96th Annual Conference & Exhibition*, June 2003, San Diego, California, Paper #69495, Air & Waste Management Association, Pittsburgh, Pennsylvania, June 2003.

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

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

Ruhlen and Page, 2001. Ruhlen, T.D. and G.W. Page, Summary of Surveys for Snowy Plovers at Owens Lake in 2001, report prepared for CH2MHILL, Santa Ana, California, 2001.

Ruhlen and Page, 2002. Ruhlen, T.D. and G.W. Page, Summary of Surveys for Snowy Plovers at Owens Lake in 2002, report prepared for CH2MHILL, Santa Ana, California, 2002.

Saint-Amand, et al., 1986. Saint-Amand, P., L.A. Mathews, C. Gaines and R. Reinking, Dust Storms from Owens and Mono Valleys, California, Naval Weapons Center, China Lake, California, NWC TP 6731, 1986.

SCAQMD, 1994. South Coast Air Quality Management District, Best Available Control Measures PM_{10} State Implementation Plan for the South Coast Air Basin, September 1994.

Schade, 2001. Schade, Theodore, Procedure to Determine Compliance with SIP Performance Criterion for Shallow Flood Dust Control Measure, Great Basin Unified Air Pollution Control District, Bishop, California, November 2001.

Schade, 2005. Great Basin Unified Air Pollution Control District, Owens Lake Dust Control: Air Pollution Control Officer's 2004-2005 Determination Requiring the City of Los Angeles to Implement, Operate and Maintain Air Pollution Control Measures on Additional Areas of the Owens Lake Bed, Letter from Theodore D. Schade, Air Pollution Control Officer, GBUAPCD, Bishop, California to Ronald Deaton, General Manager, Los Angeles Department of Water and Power, Los Angeles, California, December 21, 2005.

Schade, 2006. Great Basin Unified Air Pollution Control District, Modified Determination and Response to the City of Los Angeles' Alternative Analysis of the Air Pollution Control Officer's 2004-2005 Supplemental Control Requirements Determination (5 volumes);Letter from Theodore D. Schade, Air Pollution Control Officer, GBUAPCD, Bishop, California to Ronald Deaton, General Manager, Los Angeles Department of Water and Power, Los Angeles, California, April 4, 2006.

Scheidlinger, 1997. Scheidlinger, Carla, Vegetation as a Control Measure, Great Basin Unified Air Pollution Control District, Bishop, California, May 1997.

Scire, *et al*., 2000. Scire, J.S.; Strimaitis, D.G.; Yamartino, R.J. A User's Guide for the CALPUFF Dispersion Model (Version 5). Earth Tech, Inc., 196 Baker Avenue, Concord, MA 01742, January 2000.

SJVUAPCD, 2003. San Joaquin Valley Unified Air Pollution Control District, Final BACM Technological and Economic Feasibility Analysis, March 21, 2003.

Smith and Bischoff, 1993. Smith, G.I. and J.L. Bischoff, editors, Core OL92-2 from Owens Lake, Southeast California, US Geological Survey Open File Report 93-683, 1993.

Stevenson, 1996. Stevenson, C.A., letter from U.S. Department of the Navy, Naval Air Weapons Station, Commanding Officer, to Ellen Hardebeck, Great Basin Unified Air Pollution Control District, regarding impact of Owens Lake dust on China Lake, May 9, 1996.

Stradling, 1997. Stradling, Frank, Agrarian Test Area Construction Costs Summary, Agrarian Research & Management Company, Provo, Utah, January 1997.

Trijonis, J. *et al.*, 1988. Trijonis, John, Michael McGown, Marc Pitchford, Donald Blumenthal, Paul Roberts, Warren White, Edward Macias, Raymond Weiss, Alan Waggoner, John Watson, Judith Chow, Robert Flocchini, RESOLVE Project Final Report - Visibility Conditions and Causes of Visibility Degradation in the Mojave Desert of California, Naval Weapons Center, China Lake, California, July 1988.

US Census Bureau, 2007. U.S. Census Bureau, State and County QuickFacts, accessed July 25, 2007, http://quickfacts.census.gov/qfd/states/06/06027.html .

USEPA, 1995. United States Environmental Protection Agency, Compilation of Air Pollution Emission Factors AP-42 (Fifth edition), USEPA, Research Triangle Park, North Carolina, January 1995.

USEPA, 1992. United States Environmental Protection Agency, Fugitive Dust Background Document and Technical Information Document for Best Available Control Measures, EPA-450/2-92-004, USEPA, Research Triangle Park, North Carolina, September 1992.

USEPA, 2006a. United States Environmental Protection Agency, Compilation of Air Pollutant Emission Factors, AP-42, http://www.epa.gov/ttn/chief/ap42/index.html at http://www.epa.gov/ttn/chief/ap42/ch13/index.html at http://www.epa.gov/ttn/chief/ap42/ch13/final/c13s0202.pdf

USEPA, 2006b. United States Environmental Protection Agency, Compilation of Air Pollutant Emission Factors, AP-42, http://www.epa.gov/ttn/chief/ap42/index.html at http://www.epa.gov/ttn/chief/ap42/ch13/index.html at http://www.epa.gov/ttn/chief/ap42/ch13/final/c13s0205.pdf

USEPA, 2007a. United States Environmental Protection Agency, Proposed Finding of Failure to Attain; State of California, Owens Valley Nonattainment Area; Particulate Matter of 10 Microns or Less, EPA-R09-OAR-2007-0091, FRL-8291-1, Federal Register, Volume 72, No. 56, March 23, 2007, pp 13723-13726.

USEPA, 2007b. United States Environmental Protection Agency, Treatment of Data Influenced by Exceptional Events, EPA-HQ-OAR-2005-0159; FRL-8289-5, Federal Register, Volume 72, No. 55, March 22, 2007, pp.13560-13581.

USEPA, 2007c. United States Environmental Protection Agency, AirData website, http://www.epa.gov/air/data/monvals.html, August, 2007.

U.S. House of Representatives, 1990. Committee on Energy and Commerce. Clean Air Act Amendments of 1990. 101st Cong., 2nd session, 1990. House Report 101-490(1), May 17, 1990.

U.S. Senate, 1989. Committee on Environment and Public Works. Clean Air Act Amendments of 1990. 101st Cong., 1st sess., 1989. Senate Report 101-228, December 20, 1989.

van de Ven, *et al.*, 1989. Van de Ven, T.A.M., D.W. Fryrear, W.P. Spaan, *Vegetation Characteristics and Soil Loss by Wind*, Journal of Soil and Water Conservation, Soil and Water Conservation Society, July-August 1989.

White, *et al.*, 1997. White, Bruce, Victoria M.-S. Tsang, Greg Hyon-Mann Cho, Final Report UC Davis Wind Tunnel A Wind Tunnel Study to Determine Vegetation Cover Required to Suppress Sand and Dust Transport at Owens (dry) Lake, California, Contract No. C9464, prepared for the California State Lands Commission and the Great Basin Unified Air Pollution Control District, Davis, California, February 1997.

White, 1997. Pers. Comm. with Bruce White, University of California Davis; and Carla Scheidlinger, Great Basin Unified Air Pollution Control District, regarding wind tunnel test Results, GBUAPCD, Bishop, California, May 13, 1997.

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CHAPTER 10

Glossary, Acronyms and Measurement Units

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10.1 GLOSSARY

airshed	A geographical area that, because of topography, meteorology, and climate, shares the same air.
attainment demonstration synonym: demonstration of attainment	Analysis in a SIP showing that a specified control strategy will result in meeting air quality goals.
background PM_{10} concentration	Shall mean the concentration of PM_{10} caused by sources other than from wind blown dust emanating from the Owens Lake bed. For the purpose of modeling air quality impacts, the background concentration is assumed to be 20µg/m^3 (micrograms per cubic meter) during every hour at all receptor locations. The monitored and modeled PM_{10} emissions from the Keeler dunes, which are located off the lake bed are treated as a separate dust source area and are not included in the background concentration.
Best Available Control Measures acronym: BACM	Shall have the same definition as in the federal Clean Air Act. Approved BACM in the 2003 SIP was associated with PM_{10} emission reductions of at least 99 percent and includes Managed Vegetation, Shallow Flood, and Gravel Blanket (cover).
Board	The Governing Board of the Great Basin Unified Air Pollution Control District.
CALPUFF	A multi-layer, multi-species non-steady-state puff dispersion model that simulates the effects of time- and space-varying meteorological conditions on pollution transport, transformation and removal.
Cause an exceedance	Shall mean that PM_{10} emissions from a particulate matter source or source area is associated with a modeled or monitored PM_{10} impact at, or above, a shoreline receptor of greater than 130 µg/m^3 for a 24-hour average, not including a background concentration.
City	The City of Los Angeles, including its Department of Water and Power.

contingency measures	Shall mean dust control measures or modifications to the dust control measures that can be implemented to mitigate dust source areas that cause or contribute to an exceedance of the federal standard at the historic shoreline in the event that a previously approved control strategy was found to be insufficient.
Contribute to an exceedance	Shall mean that PM_{10} emissions from a particulate matter source or source area, when combined with other particulate matter source(s) or source area(s), is associated with a modeled or monitored PM_{10} impact at or above a shoreline receptor of greater than 130 µg/m^3 for a 24-hour average, not including a background concentration. In cases of two or more PM_{10} sources contributing to an exceedance, PM_{10} emissions from one or more of the sources may be controlled in order to reduce combined impacts to a concentration below 130 µg/m^3.
control area	Shall mean an area on the lake bed for which dust control is required. Also referred to as dust control area.
control efficiency	Shall mean the relative reduction or percent reduction in PM_{10} emissions resulting from the implementation of a control measure compared to the uncontrolled emissions.
control measures	Shall mean measures effective in reducing the PM_{10} emissions from the lake bed surface over which they are implemented. Control measures may also refer to methods used to reduce PM_{10} emissions from non-lake bed sources, such as windblown dust from the Keeler dunes or other sources of PM_{10}.
control strategy	Prescription of dust control measures (consisting of performance specifications) and delineated control area for which attainment was demonstrated in a SIP.
Cox Sand Catcher	A sand flux measuring device developed by Bill Cox of the GBUAPCD.
District	The Great Basin Unified Air Pollution Control District (aka GBUAPCD)
dust control area acronym: DCA	Any area on which dust control measures have been constructed or are slated for construction. See dust control measure.
dust control measure acronym: DCM	Shall mean measures designed to suppress sand motion and reduce dust emissions from the Owens Lake bed.

Dust ID Field Manual	Refers to the *Owens Lake Dust Source Identification Program Field Manual*, draft version (January 24, 2007), which includes the monitoring, modeling and analysis procedures for the Dust ID Program. The Dust ID Field Manual is also referred to as the *2008 Owens Lake Dust Source Identification Program Protocol* in the proposed Board Order for the 2008 SIP, which will become the new title upon approval of the 2008 SIP and Board Order.
Dust ID Model	Shall mean a computer-based air quality modeling approach developed as part of the 2003 SIP to identify emissive areas on the Owens Lake bed and to estimate the resulting PM_{10} concentrations at the shoreline. See also “Dust ID Program.”
Dust ID Program	Shall mean a long-term monitoring and modeling program that is used to identify dust source areas at Owens Lake that cause or contribute to exceedances and violations of the federal PM_{10} standard. The current protocol for conducting the Dust ID Program is included in the 2003 SIP (Exhibit 2— Attachment 4). See also “Dust ID Model” and “Dust ID Field Manual.”
efflorescence	Efflorescence occurs when subsurface moisture is drawn upward through capillary action, carrying dissolved salts with it. As moisture evaporates, the salts are left at the surface in fine powdery deposits that can be lifted by turbulent winds. Powdery efflorescent salt surfaces have a very high PM_{10} content.
emissive area	An area on the Owens Lake playa that produces dust emissions. This determination can be based on a combination of calculated sand fluxes, visible dust plume observations, and visible surface erosion after dust storm events. Rectangular approximations of emissive areas are called source areas in the Dust ID Model. See source areas.
emission rate	In general, emission rate refers to the mass of pollutants emitted from a source over a given time. Following the methodology used for the Dust ID Program, the PM_{10} emission rate is expressed as the mass of PM_{10} emitted per unit area per unit time. It is the product of the (horizontal) sand flux, an initial estimate of the emission rate, and a K-factor. PM_{10} emission rates are a required input to the Dust ID Model.

exceedance of the federal standard synonym: exceedance	Shall mean any single-day PM_{10} concentration that is monitored or modeled to be above 150 µg/m^3 (24-hour average from midnight to midnight) at any location at or above the historic shoreline.
historic shoreline synonym: shoreline	Shall mean the elevation contour line of 3,600 feet above mean sea level at Owens Lake, California.
K-factor (K_f)	An empirical ratio of the vertical PM_{10} emission flux to the horizontal sand flux at 15 cm above ground surface, as described in the Dust ID Protocol.
lake bed synonyms: Owens Lake bed, playa	Shall mean the exposed surface within and below the historic shoreline.
Managed Vegetation	Is a Dust Control Measure consisting of lake bed surfaces planted with protective vegetation. One of three approved dust control measures in the 2003 SIP. It is applied in a farm-like area of the playa where the barren playa is planted with native vegetation (saltgrass). The vegetation controls dust emissions by reducing the wind speed at the surface, sequestering mobile sand, and by holding the soil materials in place with their root systems.
may not lawfully be included in the SIP	Shall mean that inclusion of the provision in question in the revisions to the 2003 SIP has been determined by binding judicial order to be unlawful.
MCDE-BACM	Shall mean Dust Control Measures that achieve Minimum Dust Control Efficiency and are found to be appropriate for the area of application.
Minimum Dust Control Efficiency acronym: MDCE	Shall mean the lowest dust control efficiency, as determined by the Dust ID model, in the Supplemental Dust Control Area necessary to meet the federal standard at the historic shoreline.
Moat & Row	Shall mean a Dust Control Measure consisting of arrays of sand breaks that arrest sand motion.
non-attainment area	An area that has not met state and USEPA air quality requirements.

particulate matter Acronym: PM_{10}	Shall mean atmospheric particulate matter less than 10 micrometers in nominal aerodynamic diameter.
PM_{10} monitor	Shall mean an instrument used to detect the concentrations of PM_{10} in the air.
proposed project	The sum of those activities that are proposed to be adopted by the Great Basin Unified Air Pollution Control District in the PM_{10} State Implementation Plan for the Owens Valley Planning Area and implemented to reduce fugitive PM_{10} emissions from the Owens Lake playa to meet the National Ambient Air Quality Standards for particulate matter smaller than 10 microns (PM_{10}); this would include all actions, whether undertaken on or off the playa.
sand flux monitor	Shall mean a device used to measure the amount and/or rate of moving or saltating sand and sand-sized particles caused by wind erosion.
Sensit™	An electronic time-resolved sand flux monitoring device.
Shallow Flooding	Is a Dust Control Measure consisting of lake bed areas wetted to a specified proportion of surface coverage.
2003 SIP synonym: 2003 Owens Valley PM_{10} State Implementation Plan	Shall mean the Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan 2003 Revision — Adopted November 13, 2003.
SIP EIR	The Final Environmental Impact Report and any Negative Declarations, EIR addendums and/or supplements that were written to accompany and support the State Implementation Plan as required by the California Environmental Quality Act (CEQA).
source area	Spatial approximation (usually rectangular) of an emissive area that is input to the Dust ID model. See emissive area.
source delineation synonym: source delineation survey	A combination of methods to define the boundaries of a source area. Methods may consist of GPS survey, dust observation mapping, review of time-lapse video, and surface inspections.

Supplemental Control Requirements acronym: SCR	Shall mean Dust Control Measures required by the District on areas outside of the DCA or in areas within the DCA that need additional controls that cause or contribute to an exceedance of the federal PM_{10} standard at the historic shoreline of Owens Lake.
2006 Settlement Agreement Reference: GBUAPCD, 2006b	Settlement Agreement between the District and the City to resolve the City's challenge to the District's Supplemental Control Requirement determination issued on December 21, 2005 and modified on April 4, 2006, GBUAPCD, Bishop, California, December 4, 2006.

10.2 ACRONYMS

ADT	Average daily traffic
AIRS	US Environmental Protection Agency's Aerometric Information and Retrieval System
AMSL	Above mean sea level
AP-42	USEPA publication: Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I
APCO	Air Pollution Control Officer
ATV	All-Terrain Vehicle
A&WMA	Air & Waste Management Association
BACM	Best Available Control Measures
BACT	Best Available Control Technology
BLM	U.S. Department of Interior, Bureau of Land Management
CAAA	Federal Clean Air Act Amendments of 1990
CALMET	A diagnostic 3-dimensional meteorological model.
CALPUFF	See Glossary.
CalTrans	California Department of Transportation
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board

CASAC	Clean Air Scientific Advisory Committee
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CH&SC	California Health & Safety Code
CSLC	California State Lands Commission
CSC	Cox Sand Catcher
DCA	Dust Control Area
DCM	Dust control measure
dS	decisiemens
EIR	Environmental Impact Report
EQPM	Reference Particulate Sampler
FEIR	Final Environmental Impact Report
FTEE	Full-time equivalent employee
GBUAPCD	Great Basin Unified Air Pollution Control District (a.k.a. District)
GIS	Geographic Information System
GPS	Global Positioning System
KE	Kinetic energy
LADWP	Los Angeles Department of Water and Power (a.k.a. City)
MDCE	Minimum Dust Control Efficiency
MSM	Most Stringent Measures
NAAQS	National ambient air quality standards
NEAP	Natural Event Action Plans
NEPA	National Environmental Policy Act
NOAA	National Oceanographic and Atmospheric Administration
NSPS	New Source Performance Standard
OEHHA	Office of Environmental Health Hazard Assessment

OLSAC	Owens Lake Soda Ash Company
OVPA	Owens Valley PM_{10} Planning Area
PC	Particle count
PM_{10}	Particulate Matter less than 10 microns nominal aerodynamic diameter
PSD	Prevention of Significant Deterioration
R.	Range
RASS	Radio Acoustic Sounding System
RFPS	Reference Particulate Sampler
RSIP	This 2003 Revised State Implementation Plan
SCR	Supplemental Control Requirements of the 2003 SIP
SDCA	Supplemental Dust Control Area
SFM	Sand flux monitor
SIP	State Implementation Plan
SSI	Size Selective Inlet
T.	Township
T/d	U.S. short tons per day
TEOM	Tapered Element Oscillating Microbalance, continuously measures ambient PM10
TSP	Total suspended particulates
UCD	University of California at Davis
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
VMT	Vehicle miles traveled

10.3 MEASUREMENT UNITS

ac	acre, 640 acres = 1 square mile
ac-ft	acre-feet, 1 ac-ft = 325,851 gallons = 43,560 cubic feet (1 ac-ft will cover a 1 acre area 1 foot deep with water.)
^{O}C	degrees Celsius
cm	centimeter, 1 centimeter = 1/100 meter
d	day
^{O}F	degrees Fahrenheit
dS/m	decisiemens per meter (a measure of electrical conductivity, used as an indication of salinity)
ft	feet, 1 foot = 0.3048 meters
g	grams, 1,000 grams = 1 kilogram
in	inches, 1 inch = 2.54 centimeters
kg	kilogram, 1 kilogram = 2.2046 pounds
km	kilometer, 1 kilometer = 1000 meters
km^2	square kilometer
m	meters, 1 meter = 3.28 feet
m/s	meters per second, 1 meter per second = 2.237 miles per hour
mg	milligrams, 1 mg = 0.001 gram
mi	mile, 1 mile = 5280 feet
mi^2	square mile
mph	miles per hour, 1 mile per hour = 0.447 meters per second
ppm	parts per million
s	second
ton	US short ton, 1 ton = 2,000 pounds weight = 907.2 kilograms
’	feet
”	inches
µg	microgram, 1 microgram = 10^{-6} grams
$µg/m^3$	micrograms per cubic meter
µm	micron, 1 micron = 10^{-6} meters
yr	year

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CHAPTER 11

Declaration of the Clerk of the Board and Resolutions Certifying the EIR and Approving the SIP

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DECLARATION OF THE CLERK OF THE GOVERNING BOARD OF THE GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

I, Wendy Sugimura, declare as follows:

1. I am the Board Clerk of the Governing Board of the Great Basin Unified Air Pollution Control District (District). The District is a unified air pollution control district consisting of Inyo, Mono and Alpine counties in the State of California.

2. At least thirty (30) days before the January 28, 2008, public hearing of the Great Basin Unified Air Pollution Control District Governing Board to adopt the proposed final 2008 revision to the Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan, I served, in sealed envelopes or via e-mail, true copies of the following documents:

   a. Notice of Public Hearing (attached hereto as **Exhibit A**); and/or

   b. The proposed final 2008 revision to the Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan

   on the following persons or entities and addressed as indicated:

   - Administrator of the United States Environmental Protection Agency via the appropriate regional office by sending to:

     Federal Express Priority Overnight Delivery
     Mr. Wayne Nastri
     Regional Administrator
     U.S. EPA Region 9
     75 Hawthorne Street
     San Francisco, CA 94105

   - Each local air pollution control agency significantly impacted by sending to:

     Federal Express Priority Overnight Delivery
     Mr. David L. Jones
     Air Pollution Control Officer
     Kern County Air Pollution Control District
     2700 “M” Street, Suite 302
     Bakersfield, CA 93301

   - California Air Resources Board by sending to:

     Federal Express Priority Overnight Delivery
     Mr. James Goldstene
     Executive Officer
     California Air Resources Board
     1001 “I” Street
     Sacramento, CA 95814

- City of Los Angeles and the Department of Water and Power of the City of Los Angeles by sending to:

  Federal Express Priority Overnight Delivery
  Mr. David Nahai, General Manager
  Los Angeles Department of Water and Power
  111 N. Hope Street, Room 1550
  Los Angeles, CA 90012

  Federal Express Priority Overnight Delivery
  Mr. James McDaniel
  Chief Operating Officer – Water System
  Los Angeles Department of Water and Power
  111 N. Hope Street, Room 1455
  Los Angeles, CA 90012

  Federal Express Priority Overnight Delivery
  Mr. Richard F. Harasick
  Asst. Director of Water Resources
  Los Angeles Department of Water and Power
  111 N. Hope Street, Room 1449
  Los Angeles, CA 90012

c. At least thirty (30) days before the January 28, 2008, public hearing of the Great Basin Unified Air Pollution Control District Governing Board to adopt the proposed final 2008 revision to the Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan, I caused to be published a notice of the public hearing of the Governing Board of the Great Basin Unified Air Pollution Control District in the form attached hereto as **Exhibit A**, in the: 1) Inyo Register, a newspaper of general circulation in the County of Inyo, California, the county wherein the entire Owens Valley PM_{10} Planning Area is situated; 2) in the Mammoth Times, a newspaper of general circulation in Mono County, California; 3) in the Tahoe Daily Tribune, a newspaper of general circulation in El Dorado County, California (a county adjacent to Alpine County, California, which has no newspaper of general circulation); and 4) in the Ridgecrest Daily Independent, a newspaper of general circulation in Kern County, California. Copies of the proofs of such publication are attached hereto as **Exhibit B**.

d. At least thirty (30) days before the January 28, 2008, public hearing of the Great Basin Unified Air Pollution Control District Governing Board to adopt the proposed final 2008 revision to the Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan, and continuously through the date of the public hearing, a copy of the proposed final 2008 revision to the Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan was made available for public inspection at the District's main office at 157 Short Street, Bishop, California, which office is located in Inyo County, California, the region in which the entire Owens Valley PM_{10} Planning area and the affected source are located.

e. At least thirty (30) days before the January 28, 2008, public hearing of the Great Basin Unified Air Pollution Control District Governing Board on adoption of the proposed final 2008 revision to the Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation

Plan, I sent a copy of the notice of public hearing of the Governing Board of the Great Basin Unified Air Pollution Control District in the form attached hereto as **Exhibit A** to each and every addressee shown in the list attached hereto as **Exhibit C** via the United States Postal Service, postage prepaid.

f. As authorized by District Governing Board Resolution No. 2008-02, I hereby certify on behalf of the District that the document contained within is the authoritative compilation of the *Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan* and Incorporated Board Order adopted July 2, 1997; as revised by the 1998 Revision and Incorporated Board Order adopted November 16, 1998; as revised by the 2003 Revision and Incorporated Board Order adopted November 13, 2003; and as revised by the 2008 Revision and Incorporated Board Order adopted January 28, 2008/February 1, 2008.

This compilation may be correctly referred to as the "Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan and Incorporated Board Order, 2008 Revision."

I declare that the foregoing is true and correct under penalty of perjury. Done at Bishop, Inyo County, California, this 7th day of February, 2008.

Wendy Sugimura
Wendy Sugimura
Clerk of the Board

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Theodore D. Schade
Air Pollution Control Officer

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

157 Short Street, Bishop, California 93514-3537
760-872-8211 Fax: 760-872-6109

NOTICE OF PUBLIC HEARING

ADOPTION AND APPROVAL OF THE PROPOSED FINAL 2008 REVISION TO THE OWENS VALLEY PM_{10} PLANNING AREA DEMONSTRATION OF ATTAINMENT STATE IMPLEMENTATION PLAN, INCORPORATED ORDER UNDER THE PROVISIONS OF CAL. HEALTH & SAFETY CODE 42316 AND FINAL SUBSEQUENT ENVIRONMENTAL IMPACT REPORT

PLEASE TAKE NOTICE that on Monday, January 28, 2008, the Governing Board of the Great Basin Unified Air Pollution Control District (GBUAPCD) will conduct a public hearing and consider for adoption a proposed final 2008 revision to the previously-adopted Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan (2008 SIP). The public hearing, and the Governing Board's consideration for adoption, will occur at the District Governing Board's regular meeting on **Monday, January 28, 2008 at 10:00 a.m. in the Inyo County Administrative Center, Board of Supervisors Chambers, 224 North Edwards Street (US Hwy 395), Independence, California 93526**. At the meeting, the District Governing Board will: 1) consider and approve the Final 2008 Subsequent Environmental Impact Report (2008 SEIR) that analyzes the environmental impacts of the proposed project; 2) consider and approve the 2008 SIP, and 3) consider and adopt an order authorized by California Health & Safety Code Sec. 42316 for the City of Los Angeles (City) to install, operate and maintain additional dust control measures on the Owens Lake bed. Other actions related to these actions may also be taken at the meeting. Members of the public will have an opportunity to submit written comments or make oral statements at the public hearing on both the 2008 SIP and 2008 SEIR.

The GBUAPCD prepared the 2008 SIP for the control of fine dust emissions (PM_{10}) in response to a finding by the United States Environmental Protection Agency (USEPA) that the Owens Valley Planning Area did not attain the 24-hour National Ambient Air Quality Standard (NAAQS) for PM_{10}.

On November 13, 2003, the GBUAPCD approved the 2003 Revised State Implementation Plan for the Owens Valley Planning Area (2003 SIP), which was later approved by the California Air Resources Board. The 2003 SIP is currently implemented under GBUAPCD Board Order #03111301, which primarily addresses the PM_{10} control requirements to reduce wind-blown PM_{10} emissions from the exposed playa at Owens Lake. The 2003 SIP control strategy ordered the City to control PM_{10} emissions from the dried bed of Owens Lake by using shallow flooding, managed vegetation, and/or gravel coverings on 29.8 square miles of the lake bed. The 2003 SIP was intended to demonstrate attainment with the PM_{10} NAAQS by December 31, 2006 by implementing control measures over the three years prior to that date. By December 31, 2006, the City met their deadline and had implemented dust control measures on all 29.8 square miles of the lake bed as required in the 2003 SIP.

In 2006, a dispute arose between the GBUAPCD and the City regarding requirements to control dust from additional areas at Owens Lake beyond the 29.8 square miles of emissive area identified in the 2003 SIP. On December 4, 2006 a Settlement Agreement was approved by both parties to resolve this dispute. Under the major provisions of this agreement, the City agreed to implement an additional 13.2 square miles of dust control measures on the lake bed (for a total of 43 square miles) by April 1, 2010 and the District agreed to revise the 2003 SIP before March 1, 2008 to incorporate the provisions of the Settlement Agreement.

The proposed project consists of additional dust control measures to be constructed on the dried bed of Owens Lake at the southern end of Owens Valley, in Inyo County, in eastern-central California. The primary goal of the proposed project is to continue to reduce dust emissions from the dry lake bed to attain the 24-hour NAAQS for PM_{10} by March, 2012. The 2008 SIP contains the project location, history, air quality setting, emission inventory, control measures, air quality modeling, control strategy, and enabling legislation.

A draft of the 2008 SIP and its incorporated order under the provisions of California Health and Safety Code Section 42316 were made available for public review and comment between September 16, 2007 and October 30, 2007. The GBUAPCD received, reviewed and responded to the comments. The draft 2008 SIP and order were then revised. The proposed final 2008 SIP and order will be available for public review after December 20, 2007 at the GBUAPCD's Bishop Office, 157 Short Street, Bishop, California, 93514, at the GBUAPCD web-site: www.gbuapcd.org, and at Inyo County Libraries in Independence, Big Pine, Bishop, Lone Pine, Death Valley and Tecopa, California. Copies of the 2008 SIP on CD are free of charge upon request and hardcopies will be available at reproduction cost ($35). Copies of the Final 2008 SEIR will be available after January 17, 2008. All copy requests can be made by calling Wendy Sugimura, GBUAPCD Board Clerk, at (760) 872-8211.

GBUAPCD staff encourages those who have comments on the 2008 SIP to attend the meeting on January 28, 2008 and submit written comments or make oral statements to the Governing Board prior to their approval of the Final 2008 SEIR and 2008 SIP.

PROOF OF PUBLICATION

(2015.5 C.C.P.)

STATE OF CALIFORNIA,
COUNTY OF INYO

I am a citizen of the United States and a resident of the County aforesaid. I am over the age of eighteen years, and not a party to or interested in the above-entitled matter. I am the principal clerk of the printer of the

The Inyo Register

a newspaper of general circulation,

Bishop, California
County of Inyo

The Inyo Register has been adjudged a newspaper of general circulation by the Superior Court of the County of Inyo, State of California, under date of Oct. 5, 1953, Case Number 5414; that the notice, of which the annexed is a printed copy (set in type not smaller than non-pareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof, on the following dates, to wit:

DECEMBER 6, 13, 2007 AND JANUARY 10, 19, 24,

in the year **2008**

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated at Bishop, California,
this **28** day of **January, 2008**

C. Hurdle Sampietro

Signature

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NOTICE OF PUBLIC HEARING

ADOPTION AND APPROVAL OF THE PROPOSED FINAL 2008 REVISION TO THE OWENS VALLEY PM10 PLANNING AREA DEMONSTRATION OF ATTAINMENT STATE IMPLEMENTATION PLAN, INCORPORATED ORDER UNDER THE PROVISIONS OF CAL. HEALTH & SAFETY CODE 42316 AND FINAL SUBSEQUENT ENVIRONMENTAL IMPACT REPORT

PLEASE TAKE NOTICE that on Monday, January 28, 2008, the Governing Board of the Great Basin Unified Air Pollution Control District (GBUAPCD) will conduct a public hearing and consider for adoption a proposed final 2008 revision to the previously-adopted Owens Valley PM10 Planning Area Demonstration of Attainment State Implementation Plan (2008 SIP). The public hearing, and the Governing Board's consideration for adoption, will occur at the District Governing Board's regular meeting on **Monday, January 28, 2008 at 10:00 a.m. in the Inyo County Administrative Center, Board of Supervisors Chambers, 224 North Edwards Street (US Hwy 395), Independence, California 93526**. At the meeting, the District Governing Board will: 1) consider and approve the Final 2008 Subsequent Environmental Impact Report (2008 SEIR) that analyzes the environmental impacts of the proposed project; 2) consider and approve the 2008 SIP, and 3) consider and adopt an order authorized by California Health & Safety Code Sec. 42316 for the City of Los Angeles (City) to install, operate and maintain additional dust control measures on the Owens Lake bed. Other actions related to these actions may also be taken at the meeting. Members of the public will have an opportunity to submit written comments or make oral statements at the public hearing on both the 2008 SIP and 2008 SEIR.

The GBUAPCD prepared the 2008 SIP for the control of fine dust emissions (PM10) in response to a finding by the United States Environmental Protection Agency (USEPA) that the Owens Valley Planning Area did not attain the 24-hour National Ambient Air Quality Standard (NAAQS) for PM10.

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GBUAPCD staff encourages those who have comments on the 2008 SIP to attend the meeting on January 28, 2008 and submit written comments or make oral statements to the Governing Board prior to their approval of the Final 2008 SEIR and 2008 SIP.

(IR 12/6, 12/13, 1/10, 1/19, 1/24, #7455)

Proof of Publication

STATE OF CALIFORNIA
COUNTY OF MONO

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the printer of the

MAMMOTH TIMES

a newspaper of general circulation, published in

County of Mono.

The Mammoth Times was adjudicated on March 24, 1992, as a newspaper of general circulation for the Town of Mammoth Lakes and Mono County, CA.

The notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dated, to wit:

12/06 12/13
all in the year **2007**
and 01/10 01/24
all in the year **2008**

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated at Mammoth Lakes, California,
The **24th day of January, 2008**

Signature

#07-424

NOTICE OF PUBLIC HEARING

ADOPTION AND APPROVAL OF THE PROPOSED FINAL 2008 REVISION TO THE OWENS VALLEY PM10 PLANNING AREA DEMONSTRATION OF ATTAINMENT STATE IMPLEMENTATION PLAN, INCORPORATED ORDER UNDER THE PROVISIONS OF CAL. HEALTH & SAFETY CODE 42316 AND FINAL SUBSEQUENT ENVIRONMENTAL IMPACT REPORT

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sin Unified Air Pollution Control District (GBUAPCD) will conduct a public hearing and consider for adoption a proposed final 2008 revision to the previously-adopted Owens Valley PM10 Planning Area Demonstration of Attainment State Implementation Plan (2008 SIP). The public hearing, and the Governing Board's consideration for adoption, will occur at the District Governing Board's regular meeting on **Monday, January 28, 2008 at 10:00 a.m. in the Inyo County Administrative Center, Board of Supervisors Chambers, 224 North Edwards Street (US Hwy 395), Independence, California 93526.** At the meeting, the District Governing Board will: 1) consider and approve the Final 2008 Subsequent Environmental Impact Report (2008 SEIR) that analyzes the environmental impacts of the proposed project; 2) consider and approve the 2008 SIP, and 3) consider and adopt an order authorized by California Health & Safety Code Sec. 42316 for the City of Los Angeles (City) to install, operate and maintain additional dust control measures on the Owens Lake bed. Other actions related to these actions may also be taken at the meeting. Members of the public will have an opportunity to submit written comments or make oral statements at the public hearing on both the 2008 SIP and 2008 SEIR.

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On November 13, 2003, the GBUAPCD approved the 2003 Revised State Implementation Plan for the Owens Valley Planning Area (2003 SIP), which was later approved by the California Air Resources Board. The 2003 SIP is currently implemented under GBUAPCD Board Order #03111301, which primarily addresses the PM10 control requirements to reduce wind-blown PM10 emissions from the exposed playa at Owens Lake. The 2003 SIP control strategy ordered the City to control PM10 emissions from the dried bed of Owens Lake by using shallow flooding, managed vegetation, and/or gravel coverings on 29.8 square miles of the lake bed. The 2003 SIP was intended to demonstrate attainment with the PM10 NAAQS by December 31, 2006 by implementing control measures over the three years prior to that date. By December 31, 2006, the City met their deadline and had implemented dust control measures on all 29.8 square miles of the lake bed as required in the 2003 SIP.

In 2006, a dispute arose between the GBUAPCD and the City regarding requirements to control dust from additional areas at

320 PUBLIC NOTICES

Owens Lake beyond the 29.8 square miles of emissive area identified in the 2003 SIP. On December 4, 2006 a Settlement Agreement was approved by both parties to resolve this dispute. Under the major provisions of this agreement, the City agreed to implement an additional 13.2 square miles of dust control measures on the lake bed (for a total of 43 square miles) by April 1, 2010 and the District agreed to revise the 2003 SIP before March 1, 2008 to incorporate the provisions of the Settlement Agreement.

The proposed project consists of additional dust control measures to be constructed on the dried bed of Owens Lake at the southern end of Owens Valley, in Inyo County, in eastern-central California. The primary goal of the proposed project is to continue to reduce dust emissions from the dry lake bed to attain the 24-hour NAAQS for PM10 by March, 2012. The 2008 SIP contains the project location, history, air quality setting, emission inventory, control measures, air quality modeling, control strategy, and enabling legislation.

A draft of the 2008 SIP and its incorporated order under the provisions of California Health and Safety Code Section 42316 were made available for public review and comment between September 16, 2007 and October 30, 2007. The GBUAPCD received, reviewed and responded to the comments. The draft 2008 SIP and order were then revised. The proposed final 2008 SIP and order will be available for public review after December 20, 2007 at the GBUAPCD's Bishop Office, 157 Short Street, Bishop, California, 93514, at the GBUAPCD web-site: www.gbuapcd.org, and at Inyo County Libraries in Independence, Big Pine, Bishop, Lone Pine, Death Valley and Tecopa, California. Copies of the 2008 SIP on CD are free of charge upon request and hardcopies will be available at reproduction cost ($35). Copies of the Final 2008 SEIR will be available after January 17, 2008. All copy requests can be made by calling Wendy Sugimura, GBUAPCD Board Clerk, at (760) 872-8211.

GBUAPCD staff encourages those who have comments on the 2008 SIP to attend the meeting on January 28, 2008 and submit written comments or make oral statements to the Governing Board prior to their approval of the Final 2008 SEIR and 2008 SIP.

12/06 12/13/07 01/10 01/24/08
(07-424)

Tahoe Daily Tribune

Proof and Statement of Publication

3079 Harrison Avenue,
South Lake Tahoe, CA 96150
Phone (775) 881-1201
Fax (775) 887-2408

Account Number: #33100039

Legal Acct.
Great Basin Unified Air Pollution
Control District/Shirley Ono
157 Short Street
Bishop, CA. 93514

Virginia Marsh says:
That (s)he is a legal clerk of the **TAHOE DAILY TRIBUNE**, a daily newspaper published at South Lake Tahoe, in the State of California.

Notice of Public Hearing
Adoption and Approval of the Proposed Final 2008 Revision to the Owens Valley PM10 Planning Area Demonstration …
Ad #03527983

of which a copy is hereto attached, was published in said newspaper for the full required period of **4 times** commencing on **December 6, 2007,** and ending on **January 24, 2008**, all days inclusive.

Signed: Virginia Marsh

STATEMENT:

Date	Amount	Credit
01/24/08	$0.00	

NOTICE OF PUBLIC HEARING

ADOPTION AND APPROVAL OF THE PROPOSED FINAL 2008 REVISION TO THE OWENS VALLEY PM10 PLANNING AREA DEMONSTRATION OF ATTAINMENT STATE IMPLEMENTATION PLAN, INCORPORATED ORDER UNDER THE PROVISIONS OF CAL. HEALTH & SAFETY CODE 42316 AND FINAL SUBSEQUENT ENVIRONMENTAL IMPACT REPORT

PLEASE TAKE NOTICE that on Monday, January 28, 2008, the Governing Board of the Great Basin Unified Air Pollution Control District (GBUAPCD) will conduct a public hearing and consider for adoption a proposed final 2008 revision to the previously-adopted Owens Valley PM10 Planning Area Demonstration of Attainment State Implementation Plan (2008 SIP). The public hearing, and the Governing Board's consideration for adoption, will occur at the District Governing Board's regular meeting on **Monday, January 28, 2008 at 10:00 a.m. in the Inyo County Administrative Center,** Board of **Supervisors Chambers, 224 North Edwards Street (US Hwy 395), Independence, California 93526.** At the meeting, the District Governing Board will: 1) consider and approve the Final 2008 Subsequent Environmental Impact Report (2008 SEIR) that analyzes the environmental impacts of the proposed project; 2) consider and approve the 2008 SIP, and 3) consider and adopt an order authorized by California Health & Safety Code Sec. 42316 for the City of Los Angeles (City) to install, operate and maintain additional dust control measures on the Owens Lake bed. Other actions related to these actions may also be taken at the meeting. Members of the public will have an opportunity to submit written comments or make oral statements at the public hearing on both the 2008 SIP and 2008 SEIR.

The GBUAPCD prepared the 2008 SIP for the control of fine dust emissions (PM10) in response to a finding by the United States Environmental Protection Agency (USEPA) that the Owens Valley Planning Area did not attain the 24-hour National Ambient Air Quality Standard (NAAQS) for PM10.

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In 2006, a dispute arose between the GBUAPCD and the City regarding requirements to control dust from additional areas at Owens Lake beyond the 29.8 square miles of emissive area identified in the 2003 SIP. On December 4, 2006 a Settlement Agreement was approved by both parties to resolve this dispute. Under the major provisions of this agreement, the City agreed to implement an additional 13.2 square miles of dust control measures on the lake bed (for a total of 43 square miles) by April 1, 2010 and the District agreed to revise the 2003 SIP before March 1, 2008 to incorporate the provisions of the Settlement Agreement.

The proposed project consists of additional dust control measures to be constructed on the dried bed of Owens Lake at the southern end of Owens Valley, in Inyo County, in eastern-central California. The primary goal of the proposed project is to continue to reduce dust emissions from the dry lake bed to attain the 24-hour NAAQS for PM10 by March, 2012. The 2008 SIP contains the project location, history, air quality setting, emission inventory, control measures, air quality modeling, control strategy, and enabling legislation.

A draft of the 2008 SIP and its incorporated order under the provisions of California Health and Safety Code Section 42316 were made available for public review and comment between September 16, 2007 and October 30, 2007. The GBUAPCD received, reviewed and responded to the comments. The draft 2008 SIP and order were then revised. The proposed final 2008 SIP and order will be available for public review after December 20, 2007 at the GBUAPCD's Bishop Office, 157 Short Street, Bishop, California, 93514, at the GBUAPCD web-site: www.gbuapcd.org, and at Inyo County Libraries in Independence, Big Pine, Bishop, Lone Pine, Death Valley and Tecopa, California. Copies of the 2008 SIP on CD are free of charge upon request and hardcopies will be available at reproduction cost ($35). Copies of the Final 2008 SEIR will be available after January 17, 2008. All copy requests can be made by calling Wendy Sugimura, GBUAPCD Board Clerk, at (760) 872-8211.

GBUAPCD staff encourages those who have comments on the 2008 SIP to attend the meeting on January 28, 2008 and submit written comments or make oral statements to the Governing Board prior to their approval of the Final 2008 SEIR and 2008 SIP.

Pub: December 6, 13, January 10 & 24, 2007 Ad#03527983

02/05/2008 17:26 17603754880

FOR THE COUNTY OF KERN

Notice of Public Hearing

Number

Final Revision For Owens Valley,

DECLARATION OF PUBLICATION

(2015.5 C.C.P.)

State of California, County of Kern, ss:

Declarant says:

That at all times herein mentioned declarant is and was a citizen of the United States, over the age of twenty-one years, and not a party to nor interested in the within matter; that declarant is the principal clerk of the printer and publisher of THE DAILY INDEPENDENT, a newspaper of general circulation printed and published daily in the City of Ridgecrest, Indian Wells Judicial District, County of Kern, State of California, which newspaper has been adjudged a newspaper of general circulation by the said Superior Court by order made and renewed July 8, 1952, in Civil Proceeding No. 58584 of said Court; that the instrument of which the annexed is a printed copy has been published in each regular and like issue of said newspaper (and not any supplement thereof) on the following dates, to-wit:

12-6-07

1-10-08

I declare under penalty of perjury that the foregoing is true and correct.

EXECUTED ON January 10th, 2008, at Ridgecrest California.

Declarant Elaine M. Jones

NOTICE OF PUBLIC HEARING

ADOPTION AND APPROVAL OF THE PROPOSED FINAL 2008 REVISION TO THE OWENS VALLEY PM10 PLANNING AREA DEMONSTRATION OF ATTAINMENT STATE IMPLEMENTATION PLAN, INCORPORATED ORDER UNDER THE PROVISIONS OF CAL. HEALTH & SAFETY CODE 42316 AND FINAL SUBSEQUENT ENVIRONMENTAL IMPACT REPORT

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The GBUAPCD prepared the 2008 SIP for the control of fine dust emissions (PM10) in response to a finding by the United States Environmental Protection Agency (USEPA) that the Owens Valley Planning Area did not attain the 24-hour National Ambient Air Quality Standard (NAAQS) for PM10.

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In 2006, a dispute arose between the GBUAPCD and the City regarding requirements to control dust from Owens Lake beyond the 29.8 square miles of emissive area identified in the 2003 SIP. On December 4, 2006 a Settlement Agreement was approved by both parties to resolve this dispute. Under the major provisions of this agreement, the City agreed to implement an additional 13.2 square miles of dust control measures on the lake bed (for a total of 43 square miles) by April 1, 2010 and the District agreed to revise the 2003 SIP before March 1, 2008 to incorporate the provisions of the Settlement Agreement.

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02/05/2008 17:26 17603754880 DAILY INDEPENDENT PAGE 03/03

Page #2

SUPERIOR COURT OF THE STATE OF CALIFORNIA
FOR THE COUNTY OF KERN

(Space below for Filing Stamp only.)

	Number
Notice of Public Hearing	Final Revision For Owens Valley

DECLARATION OF PUBLICATION

(2015.5 C.C.P.)

State of California, County of Kern, ss:

Declarant says:

That at all times herein mentioned declarant is and was a citizen of the United States, over the age of twenty-one years, and not a party to nor interested in the within matter; that declarant is the principal clerk of the printer and publisher of THE DAILY INDEPENDENT, a newspaper of general circulation printed and published daily in the City of Ridgecrest, Indian Wells Judicial District, County of Kern, State of California, which newspaper has been adjudged a newspaper of general circulation by the said Superior Court by order made and renewed July 8, 1952, in Civil Proceeding No. 58584 of said Court; that the instrument of which the annexed is a printed copy has been published in each regular and like issue of said newspaper (and not any supplement thereof) on the following dates, to-wit:

12-6-07

1-10-08

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EXECUTED ON January 10th 2008, at Ridgecrest California.

Declarant Elaine M. Jones

Tecopa, California. Copies of the 2008 SIP on CD are free of charge upon request and hardcopies will be available at reproduction cost ($35). Copies of the Final 2008 SEIR will be available after January 17, 2008. All copy requests can be made by calling Wendy Sugimura, GBUAPCD Board Clerk, at (760) 872-8211.

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(12/06/2007 & 01/10/2008)

The Record-Courier

Proof and Statement of Publication

1503 Highway 395, Suite G,
Gardnerville, NV 89410
Ph: (775)782-5121
Fax: (775) 887-2408

Account Number: #33100039

Legal Acct
Great Basin Unified Air Pollution Control District/Shirley Ono
157 Short Street
Bishop, CA 93514

Virginia Marsh says:
That (s)he is a legal clerk of the **RECORD COURIER**, a bi-weekly newspaper published at Gardnerville, in the State of Nevada.

Notice of Public Hearing
Adoption and Approval of the Proposed Final 2008 Revision to the Owens Valley PM10 Planning Area Demonstration
Ad #03527732

of which a copy is hereto attached, was published in said newspaper for the full required period of **1 time** commencing on **December 12, 2007,** and ending on **December 12, 2007,** all days inclusive.

Signed: Virginia Marsh

STATEMENT:

Date	Amount	Credit	Balance
12/12/07	$194.59	$ 0.00	$ 194.59

NOTICE OF PUBLIC HEARING

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2/6/2008
12:00 PM

Agency	Contact	Title	Position	Street Address	Mailing Address	City	State	Zip
Agrarian Research & Management, Ltd.	Carla Scheidlinger and Frank Stradling	Ms.		162 East Line Street		Bishop	CA	93514
Air Sciences	Mark Schaaf	Mr.		421 SW 6th Avenue, Suite 1400		Portland	OR	97204
Alpine County	Judy Molnar	Ms.	Board Assistant	99 Water Street	P. O. Box 158	Markleeville	CA	96120-0248
Alpine County Counsel	William Richmond, Esq.	Mr.	District Attorney	270 Laramie	P. O. Box 248	Markleeville	CA	96120-0248
Alpine County Planning Department	Brian Peters			17300 State Route 89		Markleeville	CA	96120
Barnard Construction Company, Inc.	Scott Brady	Mr.			P.O. Box 99	Boseman	MT	59771-0099
Big Pine Distributors	Jesse Hutchings	Mr.		jessew101@earthlink.net	P. O. Box 779	Valley Center	CA	92082
Big Pine Paiute Tribe of the Owens Valley	Environmental Director	Mr.		825 S. Main Street	P.O. Box 700	Big Pine	CA	93513
Big Pine Paiute Tribe of the Owens Valley	Tribal Chair	Ms.		825 S. Main Street	P.O. Box 700	Big Pine	CA	93513
Bishop Paiute Tribe of the Owens Valley	Environmental Manager	Mr.		50 Tu Su Lane		Bishop	CA	93514
Bishop Paiute Tribe of the Owens Valley	Toni Richards	Ms.	Air Quality Specialist	50 Tu Su Lane		Bishop	CA	93514
Bishop Paiute Tribe of the Owens Valley	Tribal Chair			50 Tu Su Lane		Bishop	CA	93514
Bridgeport Indian Colony	EPA Coordinator			355 Sagebrush Drive	P.O. Box 37	Bridgeport	CA	93517
Bridgeport Indian Colony	Tribal Chair			355 Sagebrush Drive	P.O. Box 37	Bridgeport	CA	93517
California Air Resources Board	Lynn Terry			1001 "I" Street	P.O. Box 2815	Sacramento	CA	95812-2815
California Air Resources Board	Sylvia Oey	Ms.		1001 "I" Street	P.O. Box 2815	Sacramento	CA	95812-2815
California Air Resources Board	James Goldstene		Executive Director	1001 "I" Street	P.O. Box 2815	Sacramento	CA	95812-2815
California Department of Fish & Game	Denyse Racine and Brad Henderson	Ms.		407 West Line Street		Bishop	CA	93514
California Department of Fish & Game	Deputy Regional Manager	Mr.		407 West Line Street		Bishop	CA	93514
California Department of Transportation	Steve Rodarte			steve_rodarte@dot.ca.gov		Stockton	CA	95201
California Department of Transportation	Brad Mettam	Mr.	Planning and Programming		500 South Main Street	Bishop	CA	93514
California Department of Transportation	CEQA Coordinator	Mr.	Planning and Programming		500 South Main Street	Bishop	CA	93514
California Indian Legal Services	Delia Sharpe				287 Academy Street, Suite A	Bishop	CA	93514
California Indian Legal Services	Dorothy Alther	Ms.			609 S. Escondido Blvd.	Escondido	CA	92025
California Native American Heritage Commission	Debbie Pilas-Tredway	Ms.	Environmental Specialist III	915 Capitaol Mall, Room 364		Sacramento	CA	95814-4801
California Native American Heritage Commission	David Singleton			915 Capitaol Mall, Room 364		Sacramento	CA	95814-4801
California Native Plant Society, Bristlecone Pine Chapter	Daniel Pritchett	Mr.	Conservation Chair	401 E. Yaney Street	P.O. Box 364	Bishop	CA	93515
California State Lands Commission	Barbara Dugal			100 Howe Avenue, Suite 100 South		Sacramento	CA	95825
California State Lands Commission	Colin Connor			100 Howe Avenue, Suite 100 South		Sacramento	CA	95825-8202
California State Lands Commission	Greg Pelka	Mr.	Senior Mineral Resources Engineer	200 Oceangate, 12th Floor		Long Beach	CA	90802-4302
California State Lands Commission	Judy Brown			100 Howe Avenue, Suite 100 South		Sacramento	CA	95825
California State Lands Commission	Maurya Falkner	Ms.		200 Oceangate, Suite 900		Long Beach	CA	90802-4331
Carole Keegan Co.				3400 Ave. of Arts, #C107		Costa Mesa	CA	92626
China Lake NAWS	Becky Jensen	Ms.	Environmental Protection Specialist	rebecca.jensen@navy.mil	429 E. Bowen Road-STOP 4014	China Lake	CA	93555-6108
China Lake NAWS	Brenda Abernathy, Code N45NCW	Ms.	Air Quality Program Manager		429 E. Bowen Road-STOP 4014	China Lake	CA	93555-6108
China Lake NAWS	John O'Gara	Mr.	Commander	john.ogara@navy.mil	429 E. Bowen Road-STOP 4014	China Lake	CA	93555-6108
City of Bishop	David Grah	Mr.	Public Works Director	377 West Line Street		Bishop	CA	93514
City of Bishop	Gary Schley				P.O. Box 1236	Bishop	CA	93515
City of Bishop	Richard Pucci	Mr.	City Administrator/Planning Dept.		P.O. Box 1236	Bishop	CA	93515
Coso Operating Company, LLC	Colleen Brock	Ms.	Compliance Coordinator	2 Gill Station Coso Road	P. O. Box 1690	Inyokern	CA	93527
DM Miller Ranch	Daniel J. Miller			dmranch@yahoo.com		Independence	CA	93526
Eastern Sierra Audubon Society	James Wilson	Mr.		2689 Highland Drive	P.O. Box 624	Bishop	CA	93515
Environmental Mediation	David Nawi			2311 Capitol Avenue		Sacramento	CA	95816
Fanelli Stores Inc.	Peter Bogart	Mr.			Box 3663	Incline Village	NV	89450-3663
Fort Independence Indian Reservation	Environmental Director	Mr.		128 US Hwy 395	P.O. Box 67	Independence	CA	93526-2159
Fort Independence Indian Reservation	Tribal Chair			128 US Hwy 395	P.O. Box 67	Independence	CA	93526-2159
Fresno County Planning and Resource Management	Carolina Hogg	Ms.		2200 Tulare Street		Fresno	CA	93721

2/6/2008
12:00 PM

Friends of the Inyo	Paul McFarland	Mr.	Executive Director	275 South Main Street, Suite C	P. O. Box 64	Lee Vining	CA	93541
GBUAPCD Board Member	Byng Hunt	The Honorable	Supervisor, County of Mono	52 Sunnyslope Lane	P. O. Box 2608	Mammoth Lakes	CA	93546
GBUAPCD Board Member	D. "Hap" Hazard	The Honorable	Supervisor, County of Mono	664 Owens Gorge Road, Sunnyslopes	P. O. Box 554	Mammoth Lakes	CA	93546-2608
GBUAPCD Board Member	Gunter Kaiser	The Honorable	Supervisor, County of Alpine		295 Nevada Road	Markleeville	CA	96120
GBUAPCD Board Member	Henry "Skip" Veatch	The Honorable	Supervisor, County of Alpine		60 Sage Avenue	Markleeville	CA	96120
GBUAPCD Board Member	Linda Arcularius	The Honorable	Supervisor, County of Inyo	225 N. Round Valley Road	225 N. Round Valley Road	Bishop	CA	93514
GBUAPCD Board Member	Neil McCarroll, Esq.	The Honorable	Council Member, Town of Mammoth Lakes	126 Old Mammoth Road, Suite 202	P.O. Box 3339	Mammoth Lakes	CA	93546
GBUAPCD Board Member	Richard Cervantes	The Honorable	Supervisor, County of Inyo		1044 Hunter Road	Lone Pine	CA	93545
GBUAPCD Board Member Alternate	John Eastman	The Honorable	Council Member, Town of Mammoth	437 Old Mammoth Road, Suite R	P. O. Box 1305	Mammoth Lakes	CA	93546
GBUAPCD Board Member Alternate	Phillip Bennett	The Honorable	Supervisor, County of Alpine		75 Circle Drive	Markleeville	CA	96120
GBUAPCD Board Member Alternate	Susan Cash	The Honorable	Supervisor, County of Inyo		431 Short Street	Bishop	CA	93514
GBUAPCD Board Member Alternate	Vikki Magee-Bauer	The Honorable	Supervisor, County if Mono	132 Leonard Avenue	P. O. Box 25	June Lake	CA	93529
Hydro Bio, Inc.	David Groeneveld	Dr.			1220 Cerro Gordo Road	Santa Fe	NM	87501
Indian Wells Water District	Tom Muluihill	Mr.	General Manager		P.O. Box 1329	Ridgecrest	CA	93556-1329
Interagency Visitors Center	Heidi Hayner	Ms.		P.O. Box R		Lone Pine	CA	93546
Inyo County	Jan Larsen	Ms.	Senior Planner	168 N. Edwards Street	P. O. Drawer L	Independence	CA	93526
Inyo County	Ron Juliff	Mr.		224 N. Edwards Street	P.O. Drawer L	Independence	CA	93526
Inyo County Board of Supervisors	Beverly Brown	Ms.	Inyo County Supervisor - District 2		2917 Indian Creek	Bishop	CA	93514
Inyo County Board of Supervisors	Jim Bilyeu	Mr.	Inyo County Supervisor - District 4		P. O. Box 388	Independence	CA	93526
Inyo County Clerk	Mary A. Roper	Ms.		168 N. Edwards Street	P.O. Drawer F	Independence	CA	93526
Inyo County Counsel	Paul Bruce, Esq.	Mr.		224 North Edwards Street	P.O. Box M	Independence	CA	93526
Inyo County Environmental Health	Marvin Moskowitz	Mr.	Environmental Health		207 West South Street	Bishop	CA	93514
Inyo County Library	Bev Brown	Ms.	Lone Pine Branch	Washington & Bush Street	P.O. Box 745	Lone Pine	CA	93545
Inyo County Library	Death Valley Branch				Death Valley National Park	Death Valley	CA	92328
Inyo County Library	Lidia Baldwin		Big Pine Branch	110 North Main Street		Big Pine	CA	93513
Inyo County Library	Nancy Masters	Ms.	Independence Branch	168 N. Edwards Street	P.O. Drawer K	Bishop	CA	93514
Inyo County Library	Sue Franz	Ms.	Bishop Branch	210 Academy Avenue		Bishop	CA	93514
Inyo County Library	Tecopa Branch				P.O. Box 177	Tecopa	CA	92389
Inyo County Mosquito Abatement	Jerry Oser			207 West South Street		Bishop	CA	93514
Inyo County Water Department	Water Director	Mr.		163 May Street		Bishop	CA	93514
Inyo Register					450 E. Line Street	Bishop	CA	93514
Keeler Community Service District	Directors				P. O. Box 107	Keeler	CA	93530-0107
Keeler Community Service District	Nylia Swanson			150 Railroad Avenue		Lone Pine	CA	93530
Kern County Air Pollution Control District	David Jones	Mr.	APCO	2700 "M" Street, Suite 302		Bakersfield	CA	93301-2370
Kern County Planning Department	Ted James	Mr.		2700 M Street		Bakersfield	CA	93301
Kern County Public Library	Ridgecrest Branch			131 East Las Flores		Ridgecrest	CA	93555
KIBS - KBOV Radio	Arnie Palu	Mr.	News - Sports Director	apaluiii@yahoo.com	P. O. Box 757	Bishop	CA	93515-0757
KMMT - Radio & KRHV - Classic Rock	Shellie Woods	Ms.	Account Exec./Air Talent Manager		P. O. Box 1284	Mammoth Lakes	CA	93546-1284
KSRW FM & TV	Benett Kessler	Ms.			1280 N. Main Street	Bishop	CA	93514
Lahontan Regional Water Quality Control Board	Cindi Mitton	Ms.	Sr. Water Resource Control Engineer		14440 Civic Drive, Suite 200	Victorville	CA	92392
Lahontan Regional Water Quality Control Board	Harold J. Singer	Mr.	Executive Officer		2501 Lake Tahoe Boulevard	South Lake Tahoe	CA	96150
Lahontan Regional Water Quality Control Board	Mack Hakakian		Engineering Geologist		14440 Civic Drive, Suite 200	Victorville	CA	92392
Linscott, Law & Greenspan	Clare Look-Jeager	Ms.		234 E. Colorado Blvd., Suite 400		Pasadena	CA	91101
Lone Pine Paiute-Shoshone Reservation	Environmental Manager			975 Teya Road	P.O. Box 747	Lone Pine	CA	93545
Lone Pine Paiute-Shoshone Reservation	Mel Joseph	Mr.		mel@lppsr.org	P.O. Box 747	Lone Pine	CA	93545
Lone Pine Paiute-Shoshone Reservation	Cultural Representative			880 Zucco Road		Lone Pine	CA	93545
Lone Pine Paiute-Shoshone Reservation	Marjianne Yonge		Tribal Chairwoman	975 Teya Road	P.O. Box 747	Lone Pine	CA	93545
Lone Pine Paiute-Shoshone Reservation	Wilfred J. Nabahe	Mr.	Acting Tribal Administrator	wjnabahe@lppsr.org	P.O. Box 747	Lone Pine	CA	93545
Los Angeles Department of Water & Power	Robert Prendergast	Mr.		111 North Hope Street, Room 1468	Box 51111	Los Angeles	CA	90051-0100

Los Angeles Department of Water & Power	Steve Fuller	Mr.		370 West South Street	370 West South Street	Bishop	CA	93514
Los Angeles Department of Water & Power	James McDaniel		Chief Operating Officer - Water System	111 N. Hope Street, Room 1455		Los Angeles	CA	90012
Los Angeles Department of Water & Power	Gene Coufal	Mr.	Manager - Aqueduct Business Group		300 Mandich Street	Bishop	CA	93514
Los Angeles Department of Water & Power	David Nahai		General Manager	111 N. Hope Street, Room 1550		Los Angeles	CA	90012
Los Angeles Department of Water & Power	Wayne Bamossy	Mr.			P. O. Box 105	Keeler	CA	93530
Los Angeles Department of Water & Power	William T. Van Wagoner			111 N. Hope Street, Room 1315		Los Angeles	CA	90012
Los Angeles Department of Water & Power	Richard Harasick	Mr.	Asst. Director of Water Resources	111 North Hope Street, Room 1449	Box 51111, Room 1449	Los Angeles	CA	90051-0100
Los Angeles Times	Marla Cone	Ms.			P. O. Box 6018	Los Angeles	CA	90060
Mammoth Times					P.O. Box 3929	Mammoth Lakes	CA	93546
Mammoth-Pacific L.P.	Cheryl Eanes	Mr.	General Manager	ceanes@ormat.com	P. O. Box 1584	Mammoth Lakes	CA	93546-1584
Maturango Museum	Jane Burbank			100 East Flores Avenue		Ridgecrest	CA	93555
Mojave Desert Air Quality Management District	Eldon Heaston		APCO	14306 Park Avenue		Victorville	CA	92392-2383
Mono County	Christy Robles	Ms.	Board Clerk	crobles@mono.ca.gov	P. O. Box 237	Bridgeport	CA	93517-0715
Mono County	Dave Wilbrecht	Mr.	Administrator		P. O. Box 696	Bridgeport	CA	93517
Mono County	Marshall Rudolph, Esq.	Mr.	County Counsel	452 Old Mammoth Road, Suite J3	P. O. Box 2415	Mammoth Lakes	CA	93546-2415
Mono County Development Department	Scott Burns	Mr.			P.O. Box 347	Mammoth Lakes	CA	93546
Mono Lake Committee	Geoffrey McQuilkin	Mr.		Corner of Hwy. 395 and 3rd Street	P.O. Box 29	Lee Vining	CA	93541
Morrison & Foerester, LLP	Peter Hsiao, Esq.	Mr.		555 W. Fifth Street, Suite 3500		Los Angeles	CA	90013-1024
National Park Service	Dick Anderson	Mr.	Environmental Specialist	Death Valley National Park	P.O. Box 579	Death Valley	CA	92328-0579
National Park Service	Frank Hays	Mr.	Superintendent	Manzanar National Historic Site	P.O. Box 426	Independence	CA	93526
National Park Service	James T. Reynolds	Mr.	Superintendent	Death Valley National Park	P.O. Box 579	Death Valley	CA	92328-0579
National Park Service	Judith Rocchio	Ms.	Regional Air Quality Coordinator	1111 Jackson Street, Suite 700		Oakland	CA	94607
National Park Service	Wayne Badder	Mr.	Cow Creek Maint. Station	Cow Creek Maintenance Yard	P. O. Box 579	Death Valley	CA	92328
Native American Heritage Commission	Dave Singleton			915 Capitol Mall, Room 364		Sacramento	CA	95814
Neubauer & Jennison	John Neubauer	Mr.			P. O. Box 3579	Mammoth Lakes	CA	93546
News Review					109 N. Sanders	Ridgecrest	CA	93555
Northern Inyo Hospital					150 Pioneer Lane	Bishop	CA	93514-2599
Owens Valley Committee					P.O. Box 77	Bishop	CA	93515
Owens Valley Indian Water Commission	Rosanna Marrujo	Ms.		rosanna@oviwc.com	46 Tu Su Lane	Bishop	CA	93514
Owens Valley Indian Water Commission	Teri Cawelti	Ms.		46 Tu Su Lane		Bishop	CA	93514
Rantec Corporation	Lloyd Marsden	Mr.	General Manager	17 Kukuchka Lane	P.O. Box 729	Ranchester	WY	82839
Sapphos Environmental, Inc.	Marie Campbell	Ms.		133 Martin Alley	P.O. Box 50241	Pasadena	CA	91105
Sapphos Environmental, Inc.	Tony Barranda	Ms.		133 Martin Alley	P.O. Box 50241	Pasadena	CA	91105
Sierra Club - Range of Light Chapter	Chair			80 Larkspur Lane	P.O. Box 4008	Mammoth Lakes	CA	93546
Sierra Club - Range of Light Chapter	Mark Bagley	Mr.		175 S. First Street	P.O. Box 1431	Bishop	CA	93515
Sierra Club - Range of Light Chapter	Wilma Wheeler				P.O. Box 1973	Mammoth Lakes	CA	93546
Sierra Nevada Aquatic Research Laboratory	David Herbst	Mr.		1016 Mt. Morrison Road	HCR 79, Box 198	Mammoth Lakes	CA	93546
Team Engineering & Management, Inc.	Walt Pachucki	Mr.		459 W. Line Street, Suite 100	P. O. Box 1265	Bishop	CA	93515-1265
The Sheet	Ted Carleton			3343 Main Street	P. O. Box 8088	Mammoth Lakes	CA	93546
Timbisha Shoshone Tribe	Barbara Durham	Ms.		760.786.2374	P.O. Box 206	Death Valley	CA	92328
Timbisha Shoshone Tribe	Joe Kennedy		Chairperson	785 North Main Street, Suite Q		Bishop	CA	93514
Timbisha-Shoshone Tribe of Death Valley	EPA Director	Ms.			P.O. Box 206	Death Valley	CA	92328-0579
Timbisha-Shoshone Tribe of Death Valley	Tribal Chair				P.O. Box 206	Death Valley	CA	92328-0579
Town of Mammoth Lakes	Rob Clark		Town Manager	437 Old Mammoth Road, Suite R	P.O. Box 1609	Mammoth Lakes	CA	93546
Town of Mammoth Lakes	Anita Hatter		Town Clerk	437 Old Mammoth Road, Suite R	P.O. Box 1609	Mammoth Lakes	CA	93546
Tulare County Resource Management Agency	George Finney	Mr.		5961 South Mooney Blvd.		Visalia	CA	93277
U.S. Army Corps of Engineers	Fred Egeler	Dr.			P.O. Box 532711	Los Angeles	CA	90053-2325
U.S. Army Corps of Engineers	Thomas Jay Field			911 Wilshire Boulevard		Los Angeles	CA	90017
U.S. Army Corps of Engineers	Bruce Henderson	Mr.		2151 Allesandro Drive, Suite 100		Ventura	CA	93001

2/6/2008
12:00 PM

U.S. Borax, Inc.	Paul Lamos	Mr.		209 N. Main Street	P.O. Box 37	Lone Pine	CA	93545
U.S. Bureau of Land Management	Anne Halford			351 Pacu Lane, Suite 100		Bishop	CA	93514
U.S. Bureau of Land Management	Bill Dunkelberger	Mr.	Bishop Field Office		351 Pacu Lane, Suite 100	Bishop	CA	93514
U.S. Bureau of Land Management	Hector Villalobos	Mr.		300 S. Richmond Road		Ridgecrest	CA	93555-4436
U.S. Bureau of Land Management	Kirk Halford			351 Pacu Lane, Suite 100		Bishop	CA	93514
U.S. Bureau of Land Management	Terry Russi			351 Pacu Lane, Suite 100		Bishop	CA	93514
U.S. Department of the Interior	Glenn Harris	Mr.			300 So. Richmond Road	Ridgecrest	CA	93555-4436
U.S. EPA Region 9, Air Division	Larry Biland	Mr.		75 Hawthorne Street		San Francisco	CA	94105-3920
U.S. EPA, Region 9	Wayne Nastri	Mr.		75 Hawthorne Street		San Francisco	CA	94105
U.S. Forest Service	Tom Higley	Mr.			P. O. Box 429	Lee Vining	CA	93541
U.S. Forest Service	Garry Oye	Mr.	District Ranger		798 N. Main Street	Bishop	CA	93514
U.S. Forest Service	Mary Beth Hennessy			351 Pacu Lane, Suite 200		Bishop	CA	93514
Utu Utu Gwaitu Paiute Tribe	Environmental Coordinator			567 Yellow Jacket Road	Star Route 4, Box 56A	Benton	CA	93512
Utu Utu Gwaitu Paiute Tribe	Tribal Chair	Mr.	Chair	567 Yellow Jacket Road	Star Route 4, Box 56A	Benton	CA	93512
VSA N Associates	Mahabir Atwal	Dr.		12525 Lambert Road		Whittier	CA	90606
Wilson Geosciences	Ken Wilson	Mr.		1910 Pinecrest Drive		Altadena	CA	91001
	Camm Swift			346 W. LeRoy Avenue		Arcadia	CA	91107
	Charles Chisholm	Mr.			Box 8676	Reno	NV	89507
	David Gemmill	Mr.		32034 Via Saltio		Temecula	CA	92592
	Derham Giuliani	Mr.			P.O. Box 265	Big Pine	CA	93513
	George & Adriana Roberts			755 Fifth Avenue		Los Angeles	CA	90049
	Jim Macy	Mr.			P.O. Box 131	Keeler	CA	93530
	Joanne Patterson (Stewart)	Ms.			P.O. Box 221	Keeler	CA	93530
	Judy Wickman	Ms.		101 Dominey Road		Lone Pine	CA	93545
	Kathleen Hunter	Ms.		700 Indian Spring Drive		Lone Pine	CA	93545
	Norman Hoffman	Mr.			P.O. Box 111	Keeler	CA	93530
	Patrick Hannan	Mr.		1162 County Line Road		Ridgecrest	CA	93555-9072
	Tony Barrett	Mr.		6201 Minaret Road, Suite 232	P. O. Box 2294	Mammoth Lakes	CA	93546-2294
	William McGill	Mr.		1119 E. 106th Street		Los Angeles	CA	90002
	William Vanherweg	Mr.		332 N. Stine Road		Bakersfield	CA	93309
	Dan and Carol Dickman			dickman@qnet.com	P.O. Box 213	Keeler	CA	93530
	Don Odell	Mr.			P. O. Box 128	Lone Pine	CA	93545
	Julie Robinson			julie.jrdune@gmail.com	P.O. Box 106	Keeler	CA	93530
	Ken Richmond	Mr.		3500 188th Street SW, Suite 600		Lynnwood	WA	98037-4763
	Mike Patterson	Mr.		Route 1, Box 5 (Swansea)	P.O. Box 221	Keeler	CA	93530
	Mike Prather	Mr.		prather@qnet.com	P.O. Drawer D	Lone Pine	CA	93545
	Peter Pumphrey			128 Ronda Lane		Bishop	CA	93514
	Sam Wasson	Mr.		2638 Sierra Vista Way, Bishop, 93514	P. O. Box 223	Keeler	CA	93530-0225

Theodore D. Schade
Air Pollution Control Officer

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

157 Short Street, Bishop, California 93514-3537
760-872-8211 Fax: 760-872-6109

B/O #080128-02

January 28, 2008 / February 1, 2008

I HEREBY CERTIFY that at a regular meeting of the Great Basin Unified Air Pollution Control District Governing Board held in the Inyo County Supervisors Chamber, Inyo County Administrative Center, 224 North Edwards Street (Highway 395), Independence, California on February 1, 2008, continued from January 28, 2008, an order was duly made and entered as follows:

Adoption of Resolution 2008-01

Resolution of the Governing Board of the Great Basin Unified Air Pollution Control District Certifying the Final Subsequent Environmental Impact Report for the 2008 Revision to the Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan and Incorporated Board Order

A motion was made by Hunt and seconded by Arcularius to adopt Resolution 2008-01 certifying the Final Subsequent Environmental Impact Report for the 2008 Revision to the Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan and Incorporated Board Order, and authorize the Board Chair to sign the Notice of Determination.

Ayes: Cervantes, Hunt, Arcularius, Hazard, McCarroll

Noes: Ø

Abstain: Ø

Absent: Kaiser, Veatch

Motion carried 5/0 and so ordered.

ATTEST:

Wendy Sugimura, Clerk of the Board

RESOLUTION NO. 2008-01

RESOLUTION OF THE GOVERNING BOARD OF THE GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT CERTIFYING THE FINAL SUBSEQUENT ENVIRONMENTAL IMPACT REPORT FOR THE 2008 REVISION TO THE OWENS VALLEY PM_{10} PLANNING AREA DEMONSTRATION OF ATTAINMENT STATE IMPLEMENTATION PLAN AND INCORPORATED BOARD ORDER

For reasons detailed below, the Governing Board of the Great Basin Unified Air Pollution Control District (the "Governing Board") certifies that the 2008 Final Subsequent Environmental Impact Report (FSEIR) prepared for the 2008 Revision to the Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan and Incorporated Board Order (collectively, 2008 SIP) has been completed in compliance with the California Environmental Quality Act (CEQA) (Public Resources Code §21000 *et seq*.); that the Governing Board has reviewed and considered the information and analysis contained in the FSEIR; and that the FSEIR reflects the independent judgment of the Great Basin Unified Air Pollution Control District (District);

WHEREAS, pursuant to the federal Clean Air Act Amendments of 1990, the State of California is required to submit to the Administrator of the United States Environmental Protection Agency a State Implementation Plan for the Owens Valley Planning Area that demonstrates timely attainment of the National Ambient Air Quality Standards (NAAQS) for PM_{10}, defined as particulate matter having an aerodynamic diameter of a nominal 10 microns or less; and

WHEREAS, the Great Basin Unified Air Pollution Control District is the body vested by law with the authority and responsibility to develop and adopt the Attainment Demonstration State Implementation Plan for the Owens Valley PM_{10} Planning Area, and to submit the Attainment Demonstration State Implementation Plan to the California Air Resources Board for its approval and submittal to the U.S. Environmental Protection Agency Administrator on behalf of the State of California; and

WHEREAS, on July 2, 1997, the Governing Board adopted the Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan and Incorporated Board Order (collectively, 1997 SIP) to comply with the requirements of the state and federal air quality law; and

WHEREAS, on July 2, 1997, in conjunction with its adoption of the 1997 SIP, the Governing Board adopted a resolution certifying that the Final Environmental Impact Report for the 1997 SIP (1997 EIR) had been completed in compliance with CEQA, that the Governing Board had reviewed and considered the information and analysis contained in the 1997 EIR, and that the 1997 EIR reflected the independent judgment of the District; and

WHEREAS, on November 16, 1998, the 1997 SIP was revised with the adoption of the 1998 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan and Incorporated Board Order (collectively, 1998 SIP) by the Governing Board to comply with the requirements of the state and federal air quality law; and

WHEREAS, on November 16, 1998, in conjunction with its adoption of the 1998 SIP, the Governing Board adopted a resolution certifying that Addendum Number 1 to the 1997 EIR had been completed in compliance with CEQA, that the Governing Board had reviewed and considered the information and analysis contained in Addendum Number 1 to the 1997 EIR, and that Addendum Number 1 to the 1997 EIR reflected the independent judgment of the District; and

WHEREAS, on November 13, 2003, the 1998 SIP was revised with the adoption of the 2003 revision to the Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan and Incorporated Board Order (collectively, 2003 SIP) by the Governing Board to comply with the requirements of the state and federal air quality law; and

WHEREAS, on November 13, 2003, in conjunction with its adoption of the 2003 SIP, the Governing Board adopted a resolution certifying that Final Environmental Impact Report for the 2003 SIP (2003 EIR) had been completed in compliance with CEQA, that the Governing Board had reviewed and considered the information and analysis contained in the 2003 EIR, and that the 2003 EIR reflected the independent judgment of the District; and

WHEREAS, the 2003 SIP requires the District to continue studying the sources of particulate matter air pollution from the Owens Lake bed area and to take appropriate of actions to reduce particulate emissions so that the Owens Valley PM_{10} Planning Area will attain and maintain the NAAQS for particulate matter by the statutory deadlines; and

WHEREAS, on March 23, 2007, the U.S. Environmental Protection Agency (USEPA) published a finding that the Owens Valley Planning Area did not attain the 24-hour NAAQS for particulate matter of 10 microns or less (PM_{10}) by December 31, 2006 as mandated by the U.S Clean Air Act Amendments of 1990; and

WHEREAS, as a result of the USEPA finding, the 2003 SIP must be revised to include a control strategy that will provide for attainment in the Owens Valley Planning Area as soon as practicable and that said revised SIP must be submitted to the USEPA by December 31, 2007; and

WHEREAS, to comply with the requirements of the state and federal air quality laws and to comply with the provisions of a December 4, 2006 Settlement Agreement between the District and the City of Los Angeles, the District is required to adopt a 2008 revision to the 2003 SIP; and

WHEREAS, the District determined that it is the appropriate public agency to act as Lead Agency under CEQA for the adoption of the proposed 2008 SIP; and

WHEREAS, the adoption of the proposed 2008 SIP revision to the 2003 SIP is a “project” as defined by CEQA; and

WHEREAS, for the reasons set out in the FSEIR, the preparation of a subsequent environmental impact report was determined to be appropriate for the proposed adoption of the 2008 SIP under applicable CEQA statutory law and regulations; and

WHEREAS, the District prepared the FSEIR, supported by consultants with the District remaining responsible for managing the preparation of the FEIR and subjecting the consultant's drafts to its own independent review and analysis; and

WHEREAS, the Governing Board has reviewed the FSEIR in its entirety, has considered its contents, and has determined that the FSEIR for the 2008 SIP meets all the requirements for certification under CEQA and reflects the independent judgment of the District;

NOW, THEREFORE, BE IT RESOLVED by the Governing Board of the Great Basin Unified Air Pollution Control District as follows:

1. It is hereby certified that the 2008 SIP FSEIR has been completed in compliance with CEQA;

2. It is hereby certified that this 2008 SIP FSEIR has been presented to the Governing Board of the Great Basin Unified Air Pollution Control District, which has reviewed and considered the information and analysis contained therein;

3. It is hereby certified that this 2008 SIP FSEIR reflects the independent judgment and analysis of the Great Basin Unified Air Pollution Control District;

4. This certification does not represent approval or disapproval of the 2008 SIP and does not constitute final action on the 2008 SIP by the Great Basin Unified Air Pollution Control District.

APPROVED AND ADOPTED by the Governing Board of the Great Basin Unified Air Pollution Control District this ~~**28th day of January 2008,**~~ by the following vote:
1st day of February 2008

AYES: Cervantes, Hunt, Arcularius, Hazard, McCarroll

NOES: Ø

ABSTAIN: Ø

ABSENT: Kaiser, Veatch

Richard Cervantes
Richard Cervantes, Chair of Governing Board

ATTEST:

Wendy Sugimura
Wendy Sugimura
Clerk of the Governing Board

Resolution 2008-01
January 28, 2008
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AMENDED

Notice of Determination

To: ☒ Office of Planning and Research

For U.S. Mail:
P.O. Box 3044
Sacramento, CA 95812-3044

Street Address:
1400 Tenth Street, Room 121
Sacramento, CA 95814

☒ County Clerk
County of Inyo
P.O. Drawer F
Independence, CA 93526

From: (Public Agency) Great Basin Unified Air Pollution Control District
157 Short Street
Bishop, CA 93514

Contact: Theodore Schade, APCO
Phone: (760) 872-8211

FILED
FEB - 4 2008
INYO COUNTY CLERK

Subject: Filing of Notice of Determination in compliance with Section 21108 or 21152 of the Public Resources Code.

2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan
Project Title

2007021127	Mr. Theodore Schade	(760) 872-8211
State Clearinghouse Number (If submitted to Clearinghouse)	**Lead Agency Contact Person**	**Area Code / Telephone/Extension**

Owens Lake (bounded by S.H. 136, S.H. 190, and U.S. 395), Inyo County, CA
Project Location (include county)

2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan

Land Use / Zoning / General Plan Designations:
The dry Owens Lake is primarily owned and operated in trust for the people of the State of California by the California State Lands Commission. Although it is not subject to local regulatory authority by Inyo County (County), the County's General Plan recognizes the location of state-owned and federally owned lands at Owens Lake. The Land Use element of the Inyo County General Plan designates the project area as Natural Resources and State and Federal Lands. This land use designation "is applied to land or water areas that are essentially unimproved and planned to remain open in character, [and] provides for the preservation of natural resources, the managed production of resources, and recreational uses." The Inyo County Zoning Ordinance designates the project area as predominantly OS-40: Open Space Zone, 40-acre minimum lot size.

Project Description:
The project consists of additional dust control measures (DCMs) to be constructed on the dry Owens Lake bed at the southern end of Owens Valley in Inyo County, eastern-central California. The project is located approximately 5 miles south of the community of Lone Pine and approximately 61 miles south of the City of Bishop. The primary goal of the project is to continue to reduce dust emissions from the dry Owens Lake bed by implementing all Owens Lake bed fine particulate matter (PM_{10}) control measures by April 1, 2010, pursuant to the revised 2008 State Implementation Plan (SIP) to achieve the National Ambient Air Quality Standards (NAAQS) for PM_{10}. The Great Basin Unified Air Pollution Control District (District) has identified eight objectives to achieve the goal of the project, which are described in further detail in the Subsequent

08- 00

Environmental Impact Report (EIR), including the State of California's obligation of land and resource stewardship.

The project consists of the installation of Shallow Flooding, Moat & Row, and Enhancement DCMs over up to an additional 15.1 square miles of the dry Owens Lake bed before April 1, 2010. Approximately 29.8 square miles of DCMs are already in place. These controls are required by the U.S. Environmental Protection Agency in order to attain the NAAQS for PM_{10} by 2012. The project would include the construction and operation of the following project elements: DCMs, waterline and drainline connections, subsurface drainage and pumping systems, power supply and control, corridors for construction, utilities, power cables, and access roads.

The project site is not identified on a list of hazardous materials sites compiled pursuant to California Government Code Section 65962.5 (Cortese List). No hazardous material sites are located within 1 mile of the project site.

This is to advise that the Great Basin Unified Air Pollution Control District has approved the above-described
☒ Lead Agency ☐ Responsible Agency

February 1, 2008

project on ~~January 28, 2008~~, and has made the following determinations regarding the above-described project:

1. The project [☒ will ☐will not] have a significant effect on the environment.
2. ☒ An Environmental Impact Report was prepared for this project pursuant to the provisions of CEQA.
   ☐ A Negative Declaration was prepared for this project pursuant to the provisions of CEQA.
3. Mitigation measures [☒ were ☐ were not] made a condition of the approval of the project.
4. A statement of Overriding Considerations [☒ was ☐was not] adopted for this project.
5. Findings [☒ were ☐ were not] made pursuant to the provisions of CEQA.

This is to certify that the Final EIR, with comments and responses and record of project approval, is available to the general public at: Great Basin Unified Air Pollution Control District, 157 Short Street, Bishop, CA 93514.

Richard C. Cavanter	February 4, 2008 ~~January 28, 2008~~	Chairman of the Governing Board
Signature (Public Agency)	*Date*	*Title*

Date received for filing at OPR: ______________________

Revised 2005

Notice of Determination SCH No. 2007021127 Page 2 of 2

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Theodore D. Schade
Air Pollution Control Officer

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

157 Short Street, Bishop, California 93514-3537
760-872-8211 Fax: 760-872-6109

B/O #080128-03

January 28, 2008 / February 1, 2008

I HEREBY CERTIFY that at a regular meeting of the Great Basin Unified Air Pollution Control District Governing Board held in the Inyo County Supervisors Chamber, Inyo County Administrative Center, 224 North Edwards Street (Highway 395), Independence, California on February 1, 2008, continued from January 28, 2008, an order was duly made and entered as follows:

Adoption of Resolution 2008-02

Resolution of the Governing Board of the Great Basin Unified Air Pollution Control District Adopting the 2008 Revision to the Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan and Incorporated Board Order 080128-01, Adopting a Mitigation Monitoring and Reporting Plan, and Making Findings of Fact

A motion was made by Hazard and seconded by McCarroll to adopt Resolution 2008-02 adopting the 2008 Revision to the Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan, including its incorporated Board Order 080128-01, Mitigation Monitoring and Reporting Plan ad Findings of Fact.

Ayes: Cervantes, Hunt, Arcularius, Hazard, McCarroll

Noes: Ø

Abstain: Ø

Absent: Kaiser, Veatch

Motion carried 5/0 and so ordered.

ATTEST:

Wendy Sugimura
Wendy Sugimura, Clerk of the Board

RESOLUTION NO. 2008-02

RESOLUTION OF THE GOVERNING BOARD OF THE GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT ADOPTING THE 2008 REVISION TO THE OWENS VALLEY PM_{10} PLANNING AREA DEMONSTRATION OF ATTAINMENT STATE IMPLEMENTATION PLAN AND INCORPORATED BOARD ORDER 080128-01, ADOPTING A MITIGATION MONITORING AND REPORTING PLAN, AND MAKING FINDINGS OF FACT

WHEREAS, pursuant to the federal Clean Air Act Amendments of 1990 (CAAA), the State of California is required to submit to the Administrator of the United States Environmental Protection Agency (U.S. EPA) a State Implementation Plan for the Owens Valley PM_{10} Planning Area, located in southern Inyo County, California, that demonstrates timely attainment of the National Ambient Air Quality Standards (NAAQS) for PM_{10}, defined as particulate matter having an aerodynamic diameter of a nominal 10 microns or less; and

WHEREAS, the Great Basin Unified Air Pollution Control District (District) is the body vested by law with the authority and responsibility to develop and adopt the Demonstration of Attainment State Implementation Plan for the Owens Valley PM_{10} Planning Area, and to submit the Demonstration of Attainment State Implementation Plan to the California Air Resources Board for its approval and submittal to the U.S. EPA Administrator on behalf of the State of California; and

WHEREAS, on March 23, 2007, the U.S. EPA published a finding that the Owens Valley Planning Area did not attain the 24-hour NAAQS for PM_{10} by December 31, 2006 as mandated by the CAAA; and

WHEREAS, as a result of the U.S. EPA finding, the State Implementation Plan for the Owens Valley Planning Area that was approved by the District in 2003 must be revised to include a control strategy that will provide for attainment in the Owens Valley Planning Area as soon as practicable and that said revised SIP must be submitted to the U.S. EPA by December 31, 2007; and

WHEREAS, the District has prepared a proposed 2008 Revision to the Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan and Incorporated Board Order (collectively, 2008 SIP) and circulated the proposed 2008 SIP for public and governmental agency comment; and

WHEREAS, in Resolution 2008-01, which is incorporated by reference herein, the Governing Board of the Great Basin Unified Air Pollution Control District (Governing Board) certified that the 2008 Final Subsequent Environmental Impact Report (FSEIR) prepared for the 2008 SIP has been completed in compliance with the California Environmental Quality Act (CEQA); that the

Governing Board has reviewed and considered the information and analysis contained in the FSEIR; and that the FSEIR reflects the independent judgment and analysis of the District; and

WHEREAS, prior to the Governing Board's action certifying the FSEIR, the District and its consultants analyzed the environmental impacts of the proposed revisions contained in the 2008 SIP; and

WHEREAS, the FSEIR identified certain significant effects on the environment that would be caused by the City of Los Angeles' compliance with the 2008 SIP, absent the adoption of mitigation measures; and

WHEREAS, the District is required, pursuant to the California Environmental Quality Act (Public Resources Code §21000 *et seq.*), to adopt all feasible mitigation measures or feasible project alternatives that can substantially lessen or avoid any significant impacts on the environment associated with a project to be approved, such as the 2008 SIP; and

WHEREAS, the Findings of Fact and Statement of Overriding Considerations adopted as Exhibit A to this Resolution 2008-02 demonstrate that, except for impacts to air quality related to greenhouse gas emissions, all of the significant impacts on the environment associated with the 2008 SIP can be avoided through the adoption of feasible mitigation measures; and

WHEREAS, with respect to the impacts of the proposed project to air quality related to greenhouse gas emissions, the District has included mitigation measures to reduce those impacts to the extent feasible; and

WHEREAS, the Governing Board has determined, for reasons set forth in Exhibit A hereto and described in the FSEIR, that the 2008 SIP is superior to all feasible project alternatives, that feasible project alternatives would not reduce any potentially significant and unavoidable impact of the 2008 SIP to less-than-significant levels; and that the No Project Alternative, which would avoid these impacts, would fail to achieve most of the objectives and benefits of the 2008 SIP; and

WHEREAS, the Governing Board is required by Public Resources Code §21081.6, to adopt a mitigation monitoring and reporting program to ensure that the mitigation measures adopted by the District are actually carried out; and

WHEREAS, the final Mitigation Monitoring and Reporting Program for the 2008 SIP has been prepared, and is adopted as Exhibit B to this resolution.

NOW, THEREFORE, BE IT RESOLVED by the Governing Board of the Great Basin Unified Air Pollution Control District as follows:

1. Through this Resolution, the Governing Board hereby approves and adopts the 2008 Revision to the Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan and Incorporated Board Order 080128-01, which approval and adoption are effective immediately.

2. Through this Resolution, the Governing Board hereby adopts and issues to the City of Los Angeles, Great Basin Unified Air Pollution Control District Order No. 080128-01 set forth in Chapter 8 of the 2008 Revision to the Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan and Incorporated Board Order, which adoption and issuance are effective immediately.

3. Through this Resolution, the Governing Board hereby reaffirms each of its findings and resolutions made in Resolution 2008-01, which is incorporated herein by reference.

4. Through this Resolution, the Governing Board makes all the findings set forth in the Findings of Fact and adopts the Statement of Overriding Considerations, which are incorporated herein by reference and included as Exhibit A to this Resolution.

5. Through this Resolution, the Governing Board, in order to satisfy its obligations pursuant to Public Resources Code §21081.6, hereby adopts and incorporates by reference the Mitigation Monitoring and Reporting Program, which is included as Exhibit B to this Resolution.

6. By adopting this Resolution, including the exhibits incorporated herein and attached hereto, the Governing Board has satisfied its obligations pursuant to Pubic Resources Code §21081 and California Code of Regulations, Title 14, §15091, in that the Governing Board has made one or more of the following findings with respect to the significant or potentially significant effects of the 2008 SIP: (1) Changes or alterations have been required in, or incorporated into the 2008 SIP which mitigate or avoid many of the significant environmental effects thereof as identified in the FSEIR; (2) Some changes or alterations are within the responsibility and jurisdiction of another public agency and such changes have been, or can and should be, adopted by that other agency; (3) Specific economic, legal, social, technological, or other considerations make infeasible additional mitigation measures or alternatives identified in the FSEIR; and (4) The Governing Board finds that specific overriding economic, legal, social, technological and other benefits of the project outweigh the significant effects on the environment as set forth in the incorporated Statement of Overriding Considerations.

7. The Clerk of the Governing Board is hereby authorized to compile and publish the complete 2008 Revision to the Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan and Incorporated Board Order, adopted on January 28, 2008 and shall certify on behalf of the District that said compilation is the authoritative version of the Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan and Incorporated Board Order.

APPROVED, ADOPTED and ORDERED by the Governing Board of the Great Basin Unified Air Pollution Control District this ~~**28th day of January 2008**~~, by the following vote:
1st day of February 2008

AYES: Cervantes, Hunt, Arcularius, Hazard, McCarroll

NOES: Ø

ABSTAIN: Ø

ABSENT: Kaiser, Veatch

Richard Cervantes, Chair of the Governing Board

ATTEST:

Wendy Sugimura
Clerk of the Governing Board

Incorporated attachments:

Exhibit A - Findings of Fact and Statement of Overriding Considerations
Exhibit B - Mitigation Monitoring and Reporting Program

Governing Board of the Great Basin Unified Air Pollution Control District
January 28, 2008/February 1, 2008

RESOLUTION NO. 2008-02

EXHIBIT A - FINDINGS OF FACT

2008 Revision to the
Owens Valley PM_{10} Demonstration of Attainment
State Implementation Plan and Incorporated Board Order

Findings of Fact Under the Provisions of California Health & Safety Code §42316(a);
Findings of Fact on Significant Environmental Impacts of the Proposed Project (2008 SIP);
Findings of Fact on Project Alternatives; and Other Findings of Fact

Related Documentation:

Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plans as adopted on: February 1, 2008, November 13, 2003, November 16, 1998, and July 2, 1997

Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Environmental Impact Reports (EIRs) as follows:

February 1, 2008:	Final Subsequent EIR (SCH No. 2007021127)
November 13, 2003:	Final EIR (SCH No. 2002111020)
November 16, 1998:	Addendum No. 1 to the EIR (SCH No. 96122077)
July 2, 1997:	Final EIR (SCH No. 96122077)

Staff report on the subject of the 2008 SIP and EIR dated January 28, 2008 prepared for the Great Basin Unified Air Pollution Control District Governing Board

Project Files May Be Reviewed at:
Great Basin Unified Air Pollution Control District
157 Short Street, Bishop, California 93514
(760) 872-8211

RESOLUTION NO. 2008-02

Exhibit A - Findings of Fact Relating to:

2008 Revision to the
Owens Valley PM_{10} Demonstration of Attainment
State Implementation Plan and Incorporated Board Order

Contents

A. Findings of fact under the provisions of California Health & Safety Code §42316(a)

Section 42316(a) of the California Health and Safety Code provides the authority for the Great Basin Air Pollution Control District to "require the City of Los Angeles to undertake reasonable measures, including studies, to mitigate the air quality impacts of its activities in the production, diversion, storage, or conveyance of water and may require the City to pay, on an annual basis, reasonable fees, based on an estimate of the actual costs to the district of its activities associated with the development of the mitigation measures and related air quality analysis with respect to those activities of the City. The mitigation measures shall not affect the right of the City to produce, divert, store, or convey water and, except for studies and monitoring activities, the mitigation measures may only be required or amended on the basis of substantial evidence establishing that water production, diversion, storage, or conveyance by the City causes or contributes to violations of state or federal ambient air quality standards."

On the basis of substantial evidence in the record, and for the reasons set forth in the staff report prepared for the Governing Board's January 28, 2008/February 1, 2008 meeting regarding the adoption of the 2008 Revision to the Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan and Incorporated Board Order Number 080128-01 (collectively, 2008 SIP),which is hereby incorporated herein by reference, the Governing Board of the Great Basin Unified Air Pollution Control District (Governing Board) makes the following findings:

1. The Governing Board finds that there are violations of the state and federal ambient air quality standards for PM_{10} in the Owens Valley PM_{10} Planning Area.

2. The Governing Board finds that the dried bed of the Owens Lake causes and is the primary contributor to the violations of the state and federal ambient air quality standards for PM_{10} in the Owens Valley PM_{10} Planning Area.

3. The Governing Board finds that the City of Los Angeles' water diversions in the Owens Valley have uncovered essentially all of the dust source areas on the dried bed of Owens Lake, thus causing and contributing to violations of the state and federal ambient air quality standards for PM_{10} in the Owens Valley PM_{10} Planning Area.

4. The Governing Board finds that the dust control measures (DCMs) known as Shallow Flooding, Managed Vegetation, and Gravel Blanket, as required and permitted by the 2008 SIP, have been approved by the U.S. Environmental Protection Agency as Best Available Control Measures (BACM) for the control of PM_{10} emissions from the dried bed of Owens Lake.

5. The Governing Board finds that the DCMs known as Shallow Flooding, Managed Vegetation, and Gravel Blanket, as required and permitted by the 2008 SIP, are reasonable and proven control measures for controlling PM_{10} emissions from the dried bed of Owens Lake.

6. The Governing Board finds that the DCMs known as Shallow Flooding, Managed Vegetation, and Gravel Blanket, as required and permitted by the 2008 SIP, will be effective in mitigating the air quality impacts caused by the City of Los Angeles' water diversions.

7. The Governing Board finds that the alternative DCM known as Moat & Row has not been approved by the District, the state or the U.S. EPA as BACM and, although the 2008 SIP provides for the City to construct this alternative DCM, the District takes no position on its effectiveness or reasonableness, at this time.

8. The Governing Board finds that the DCMs and all their associated requirements contained in the 2008 SIP do not affect the right of the City to produce, divert, store or convey water.

9. The Governing Board finds the DCMs required and provided for by the 2008 SIP can be completed by the milestones and deadlines set forth in the 2008 SIP.

10. The Governing Board finds that the time period for implementation contained in the 2008 SIP is a reasonable period to complete the implementation of the DCMs.

11. The Governing Board finds that the contingency measures contained in the 2008 SIP are reasonable and adequate to ensure the Owens Valley PM_{10} Planning Area attains the federal PM_{10} ambient air quality standard as expeditiously as practicable.

12. The Governing Board finds that there are reasonable and valid mechanisms in place that allow the District to enforce compliance with the requirements contained in the 2008 SIP.

13. The Governing Board finds that California Health & Safety Code Section 42316(a) provides the District with the authority and resources necessary to insure compliance with the requirements set forth in the 2008 SIP.

14. The Governing Board makes each and every of the above findings on the basis of substantial evidence in the record. The District is the custodian of the materials that constitute the record of proceedings upon which the decision to approved the Proposed Project is based. These materials are located at the District's offices at 157 Short Street, Bishop, California 93514.

B. Findings of fact regarding the adoption of the 2008 SIP

15. Based upon the fact that the Owens Valley PM_{10} Planning Area (Owens Valley) has been designated a serious non-attainment area by the USEPA, and that the Owens Valley is required by the Clean Air Act Amendments of 1990 to attain the PM_{10} 24-hour standard as expeditiously and practicable, the GBUAPCD Governing Board finds that the adoption of the 2008 SIP is necessary.

16. Based upon the fact that California Health and Safety Code Section 42316(a) allows the District to require the City of Los Angeles to undertake reasonable measures to mitigate the air quality impacts of the City's water-gathering activities, the Governing Board finds that

the District has the authority to adopt the 2008 SIP, including the adoption and issuance of District Order No. 080128-01.

17. Based upon public comment on the Plan, the Governing Board finds that the 2008 SIP and Order are written clearly so that they can be easily understood by the persons affected.

18. Based upon an examination of the legal and regulatory history of the Owens Valley PM_{10} Planning Area, and the above findings on the compatibility of the Plan and Order with Health and Safety Code Section 42316, the Governing Board finds that the 2008 SIP is consistent with existing statutes, court decisions, and state and federal regulations.

19. Based upon the fact that state law delegates to the District the responsibility for control of stationary sources of air pollution, the Governing Board finds that the 2008 SIP does not duplicate existing state or federal regulations.

20. The Governing Board references the Clean Air Act Amendments of 1990 and State of California Health and Safety Code Section 42316 as the laws that the District implements through the 2008 SIP.

21. The Governing Board finds that reasonable notice of the Governing Board's intention to hold a public hearing to adopt the 2008 SIP was given in compliance with the provisions of Title 40 of the Code of Federal Regulations, Section 51.102.

22. The Governing Board finds that notice of the public hearing to adopt the 2008 SIP was published in the following newspapers more than 30 days in advance of the hearing: the *Inyo Register* (Inyo County), the *Review Herald* (Mono County) and the *Tahoe Daily Tribune* (for Alpine County).

23. The Governing Board finds that the 2008 SIP was available for public inspection at the District's office in Bishop, California at least 30 days in advance of the public hearing to adopt the Plan.

24. The Governing Board finds that the Executive Officer of the California Air Resources Board was given notice of the public hearing and a copy of the 2008 SIP at least 30 days in advance of the hearing.

25. The Governing Board finds that the Administrator of the U.S. Environmental Protection Agency (through the Regional Administrator) was given notice of the public hearing and a copy of the 2008 SIP at least 30 days in advance of the hearing.

26. The Governing Board finds that the adjacent Kern County Air Pollution Control District was given notice of the public hearing and a copy of the 2008 SIP at least 30 days in advance of the hearing.

27. The Governing Board finds that the City of Los Angeles was given notice of the public hearing and a copy of the 2008 SIP at least 30 days in advance of the hearing.

28. The Governing Board finds that for the reasons and based on the facts set forth in the 2008 Final Subsequent Environmental Impact Report (2008 FSEIR) for the 2008 SIP, that a subsequent environmental impact report was the necessary and sufficient environmental review document required to be prepared under the California Environmental Quality Act (CEQA) for adoption of the 2008 SIP, and the District's decision to prepare a subsequent environmental impact report is both correct and adequately explained in the text of the 2008 FSEIR. The Governing Board finds as true the facts cited in the 2008 FSEIR to support the District's decision to prepare a subsequent environmental impact report.

29. The Governing Board makes each and every of the findings in this Exhibit on the basis of substantial evidence in the record. The District is the custodian of the materials that constitute the record of proceedings upon which the decision to approve the Proposed Project is based. These materials are located at the District's offices at 157 Short Street, Bishop, California 93514.

C. Finding of fact regarding the Final Subsequent Environmental Impact Report prepared for the 2008 SIP (State Clearinghouse No. 2007021127)

The revisions contained in the proposed 2008 Revision to the Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan and Incorporated Board Order (collectively, 2008 SIP) is a "project" as defined by the California Environmental Quality Act (CEQA) (Public Resources Code §21000 *et. seq.)*. The Great Basin Unified Air Pollution Control District (District) is the lead agency for the project.

On July 2, 1997, the Governing Board of the Great Basin Unified Air Pollution Control District (Governing Board) adopted and certified the Final Environmental Impact Report (1997 EIR) for the 1997 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan and Incorporated Board Order (1997 SIP) concurrently with the adoption of that 1997 SIP. The 1997 SIP was revised when the Governing Board adopted the 1998 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan and Incorporated Board Order on November 16, 1998 (1998 SIP). The Governing Board, concurrently with the 1998 SIP adoption, certified an addendum to the 1997 EIR entitled Addendum No. 1 to the Final Environmental Impact Report for the 1998 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan and Incorporated Board Order (1998 EIR). The 1998 SIP was revised when the Governing Board adopted the 2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan and Incorporated Board Order on November 13, 2003 (2003 SIP). The Governing Board, concurrently with the 2003 SIP adoption, certified the 2003 EIR entitled Final Environmental Impact Report for the 2003 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan and Incorporated Board Order (2003 EIR).

For consideration of the revisions contained in the 2008 SIP, the District has prepared a 2008 Final Subsequent Environmental Impact Report for the 2008 SIP. Drafts of the proposed 2008 SIP and 2008 FSEIR were circulated to public agencies and the public for a 45-day review and comment period. Pursuant to the requirements of CEQA, the 2008 FSEIR describes the 2008 SIP (also referred to herein as the 'Proposed Project') and affected environment; it identifies, analyzes and evaluates the potential significant environmental impacts that may result from the Proposed Project; it identifies measures to mitigate adverse environmental impacts; and it identifies and compares the merits of project alternatives.

CEQA Guidelines require the District Governing Board to consider the information in the 2008 FSEIR along with other information that may be presented to the District when deciding whether to approve the Proposed Project. The 2008 FSEIR sets forth the information to be considered in the Governing Board's evaluation of benefits and potential impacts to the environment resulting from the implementation of the 2008 SIP.

The 2008 FSEIR for the proposed 2008 SIP identifies potential adverse environmental impacts in the following environmental issue areas: air quality, biological resources, cultural resources, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, transportation and traffic, and utilities and service systems. The 2008 FSEIR determined that there was no potential for adverse environmental impacts in the following environmental issue areas: aesthetics, agricultural resources, geology and soils, noise, population and housing, public services and recreation. It was concluded in the 2008 FSEIR that no significant adverse impacts will remain after implementation of feasible mitigation measures for any issue area other than air quality. However, it was concluded in the 2008 FSEIR that significant adverse impacts will remain after implementation of feasible mitigation measures for air quality.

The final 2008 FSEIR summarizes the significant environmental impacts of the Proposed Project and project alternatives and describes how these impacts are to be mitigated. An MMRP will be adopted concurrently with these findings (Exhibit B). The MMRP sets forth a program to ensure that required environmental impact mitigation measures are properly implemented.

Based on the findings and the information contained in the record, the Great Basin Unified Air Pollution Control District (District) has made the following findings with respect to the significant impacts on the environment resulting from the 2008 SIP pursuant to Section 15091 of the State of California Environmental Quality Act (CEQA) Guidelines.

- Changes or alterations have been required in, or incorporated into, the project that avoid or substantially lessen the significant environmental effects as identified in the Final Subsequent Environmental Impact Report (EIR).

- The changes and alterations are within the responsibility and jurisdiction of the District. The District may designate an official representative, agent, or authorized party to implement certain measures as part of preconstruction, construction, and postconstruction activities. Pursuant to Section 15091(c) of the State CEQA Guidelines, the Mitigation Monitoring Program identifies responsible agencies for the mitigation measures.

- The mitigation measures identified in the Final Subsequent EIR are feasible and will be required as conditions of approval.

Based on the foregoing findings and the substantial evidence contained in the record, and as conditioned by the foregoing findings:

- All significant effects on the environment due to the project have been eliminated or substantially lessened where feasible.

- Any remaining significant effects on the environment found to be unavoidable are acceptable due to the overriding concerns set forth in the foregoing Statement of Overriding Considerations.

The details regarding the findings of fact regarding the 2008 FSEIR contain ten sections, are bound separately in the 2008 FSEIR and are hereby made part of this Exhibit.

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APPENDICES

Appendix A*	PM_{10} Monitoring Data – All Sites 1987 through 2006 (690 pages)
Appendix B*	Air Quality Modeling Report (216 pages)
Appendix C	Public Comments on the Draft SIP and District Responses (118 pages)
Appendix D*	Environmental Findings of Fact and Mitigation Monitoring Program

Hardcopies of these appendices are available upon request.

2008 SIP Contributors and Support Staff:
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