Great Basin Unified Air Pollution Control District

2013 Amendment to the Owens Valley PM_{10} SIP

Board Order 130916-01

Exhibit 1: 2008 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan Board Order Number 080128-01 ("SIP Order")

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. New Managed Vegetation areas
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. All Managed Vegetation areas

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."

<u>PM_{10} CONTROL MEASURE COMPLIANCE AND ENFORCEMENT</u>

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.

<u>STORMWATER MANAGEMENT</u>

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

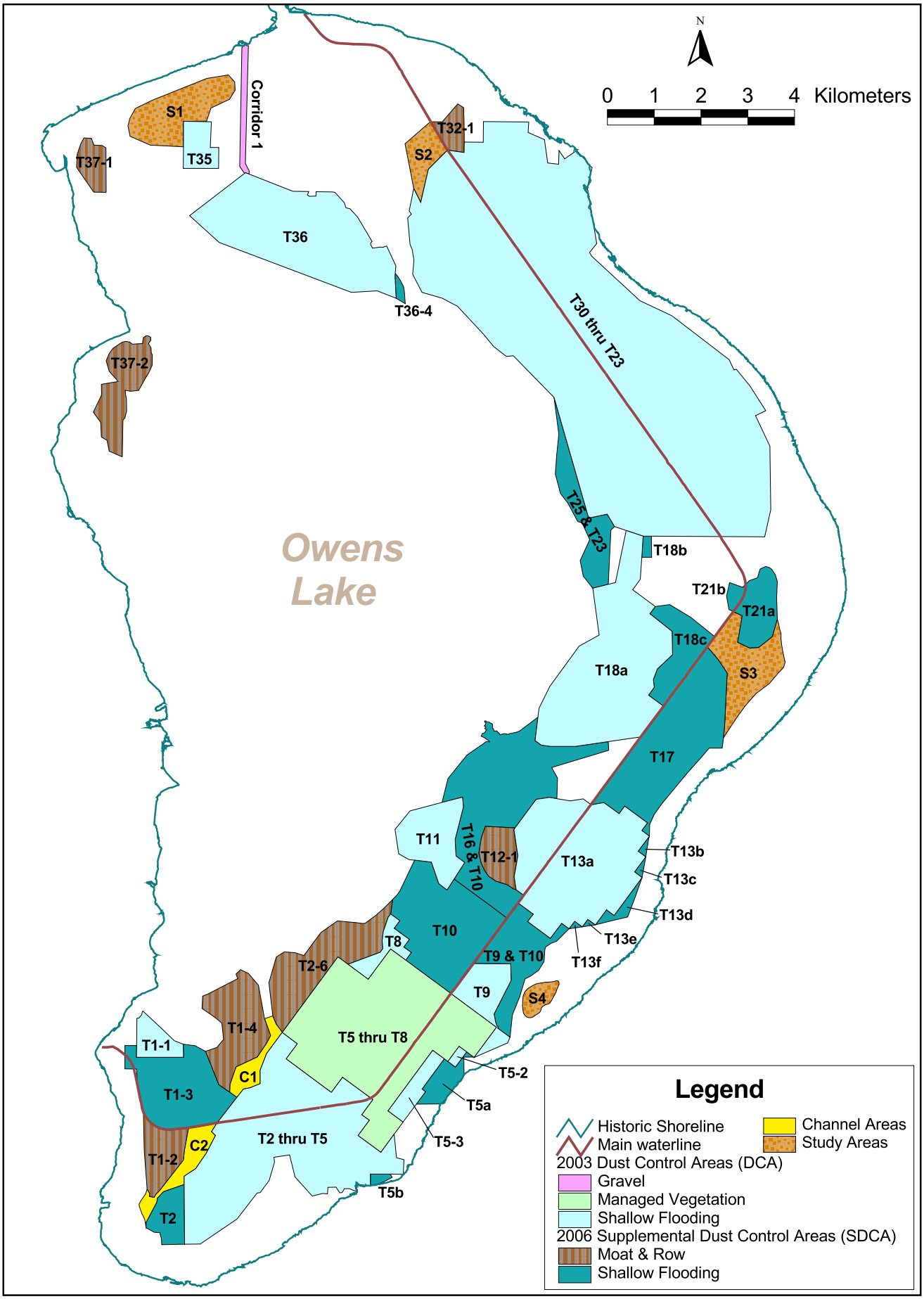

Exhibit 1 - Map and coordinates of PM_{10} control areas

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
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
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
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
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	Coordinates(UTM Zone11 meters NAD83) X-coordinates	Y-coordinates
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	Coordinates(UTM Zone11 meters NAD83) X-coordinates	Y-coordinates

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

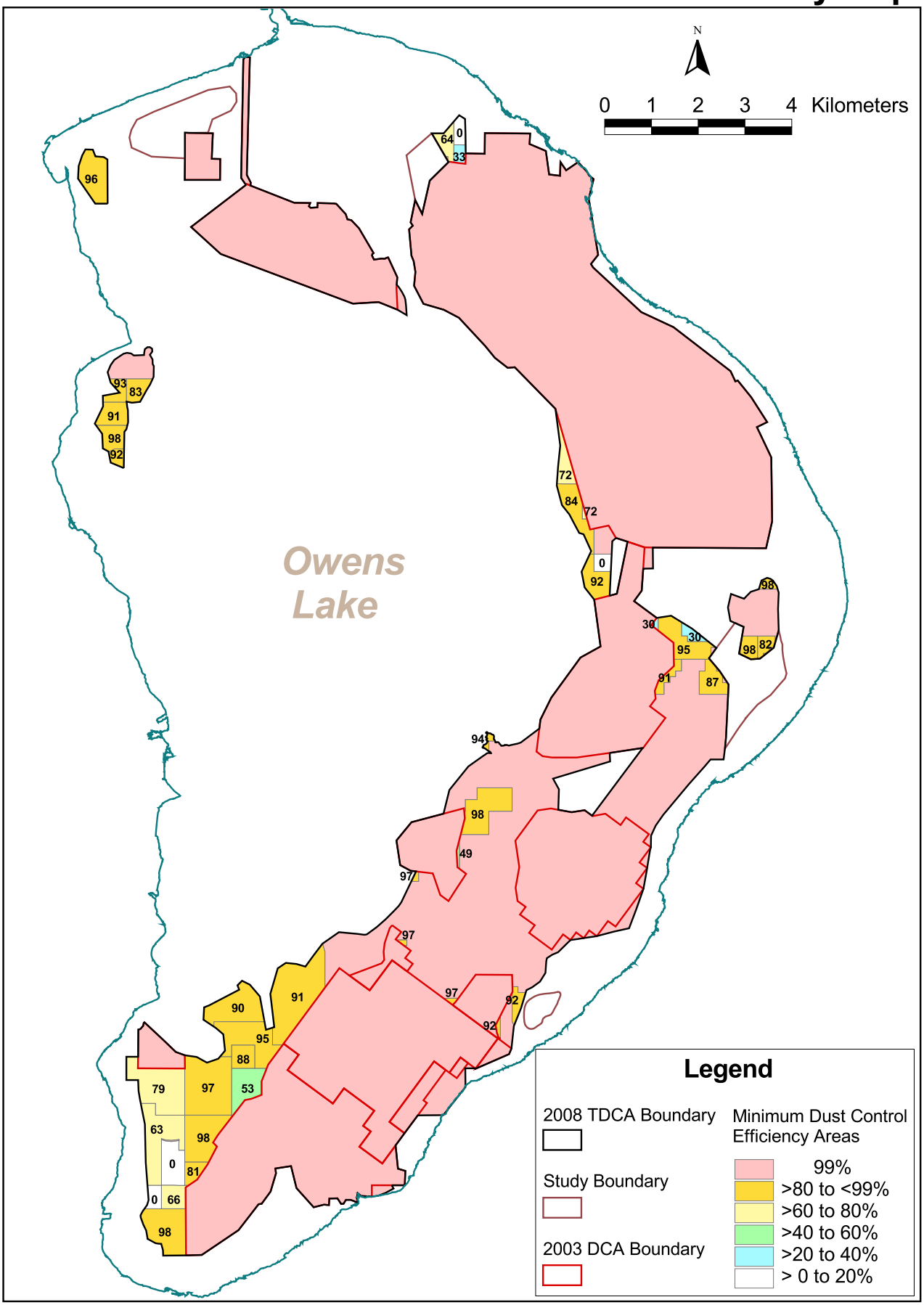

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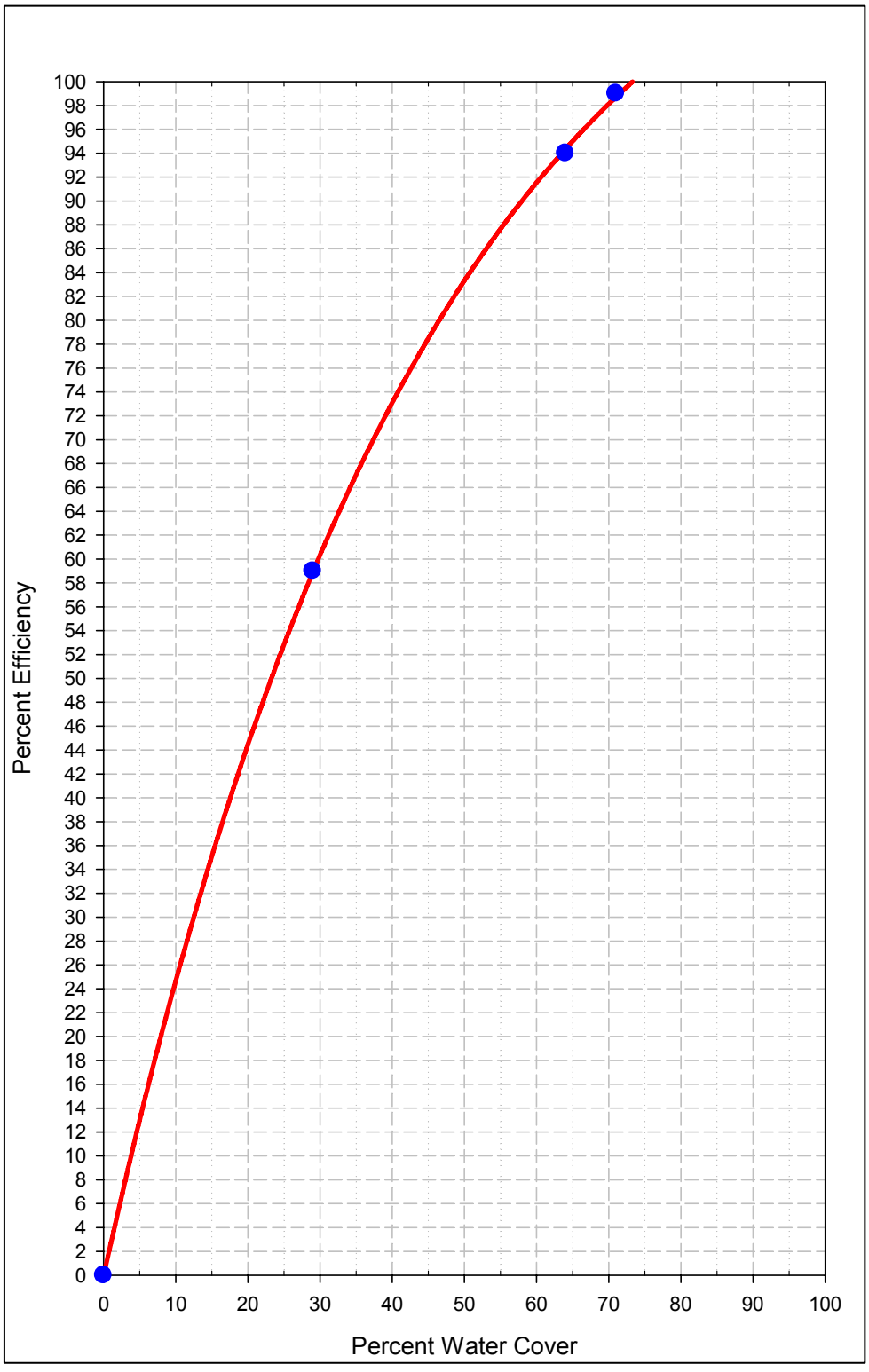
Exhibit 3 - Shallow Flood control efficiency curve



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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:

DUST CONTROL MEASURES (DCMs)

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.

FALL AND SPRING SHALLOW FLOOD DCM COMPLIANCE

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.

REVISION OF THE STATE IMPLEMENTATION PLAN (SIP)

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" Weatch
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).

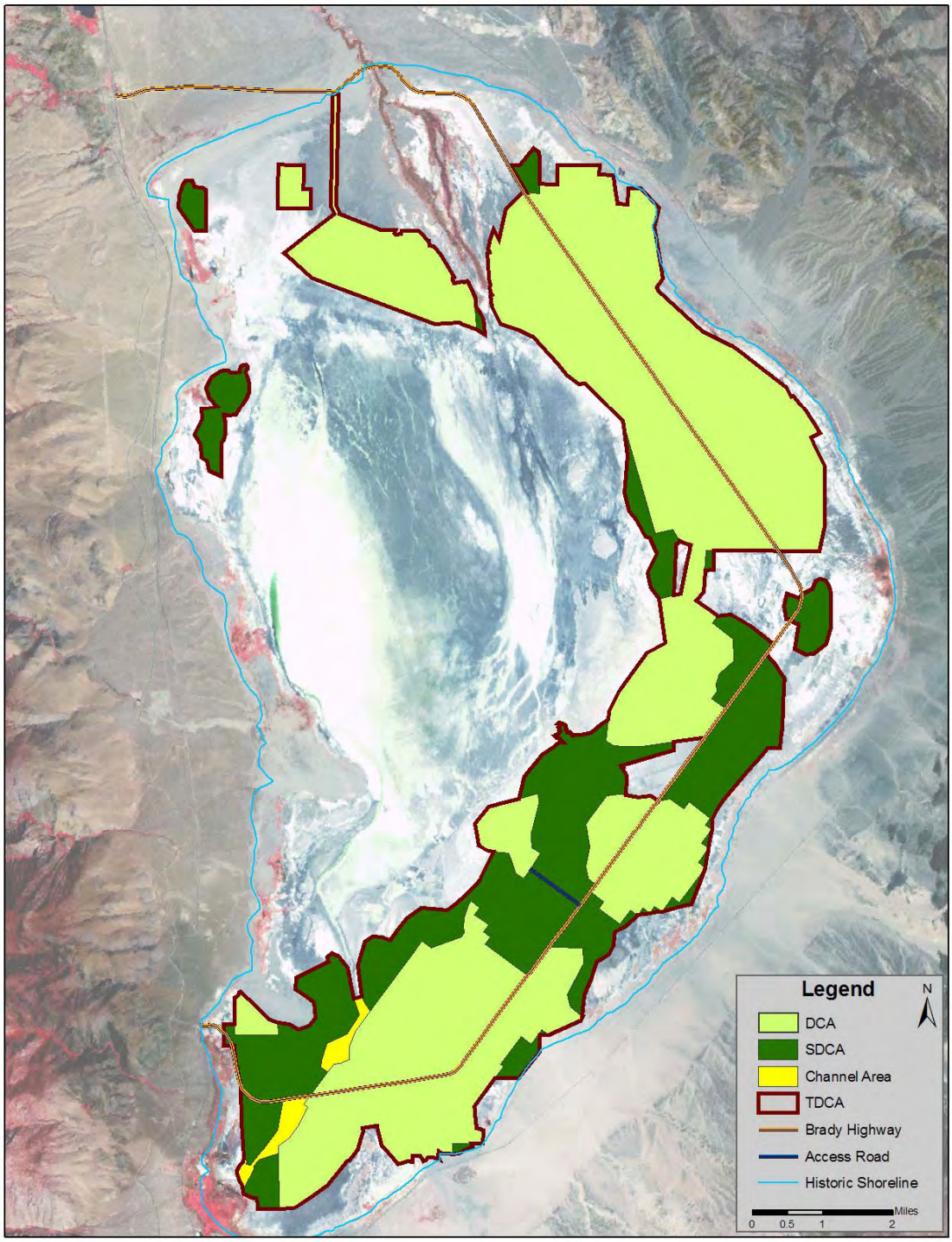

EXHIBIT 2 -- 2006 SUPPLEMENTAL DUST CONTROL AREA COORDINATE DESCRIPTIONS

KEY MAP

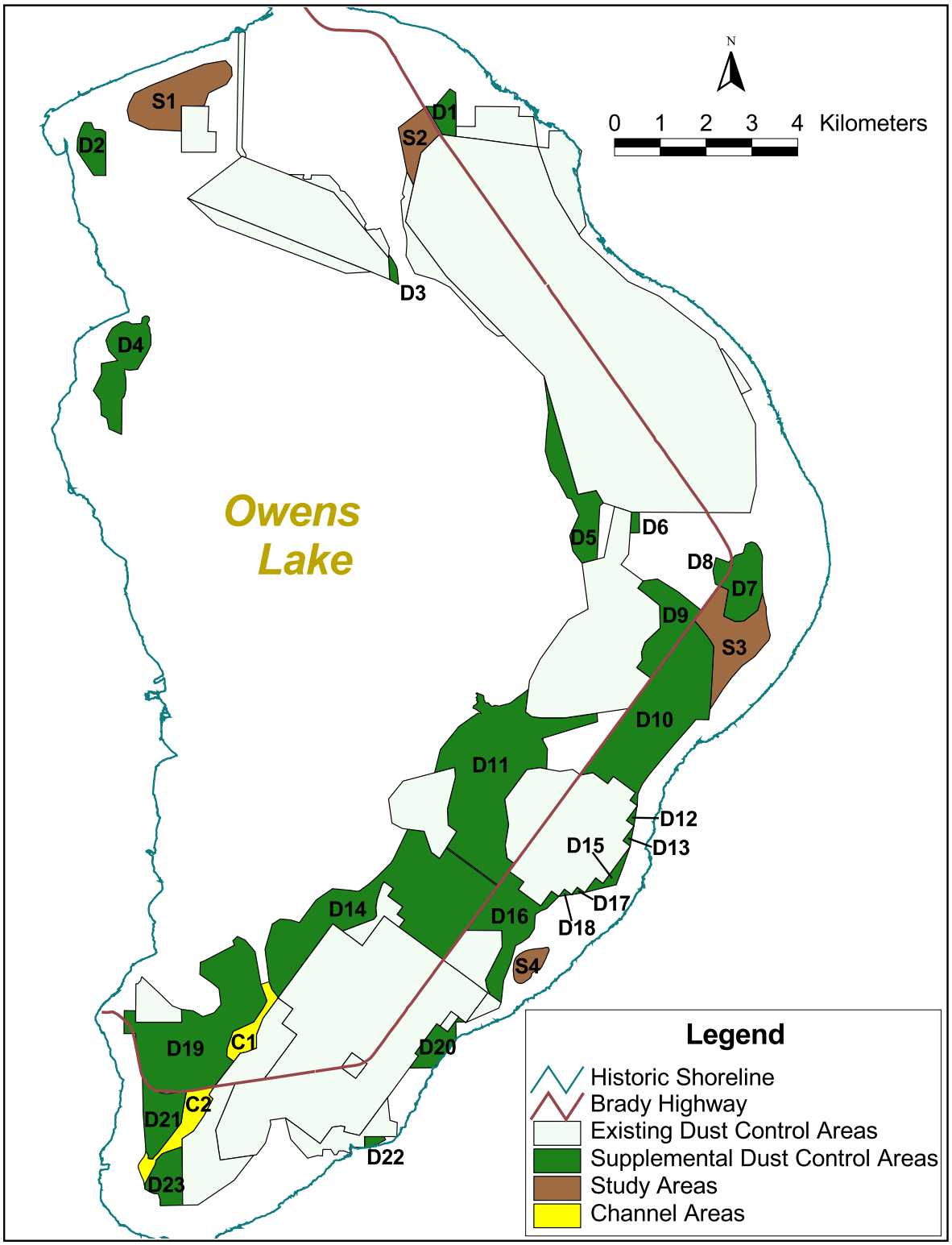

EXHIBIT 2 -- Owens Lake 2006 Supplemental Dust Control Area Coordinate Descriptions

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
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	1.88	SDCA	410,472.1880	4,023,123.1172
continued			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
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.

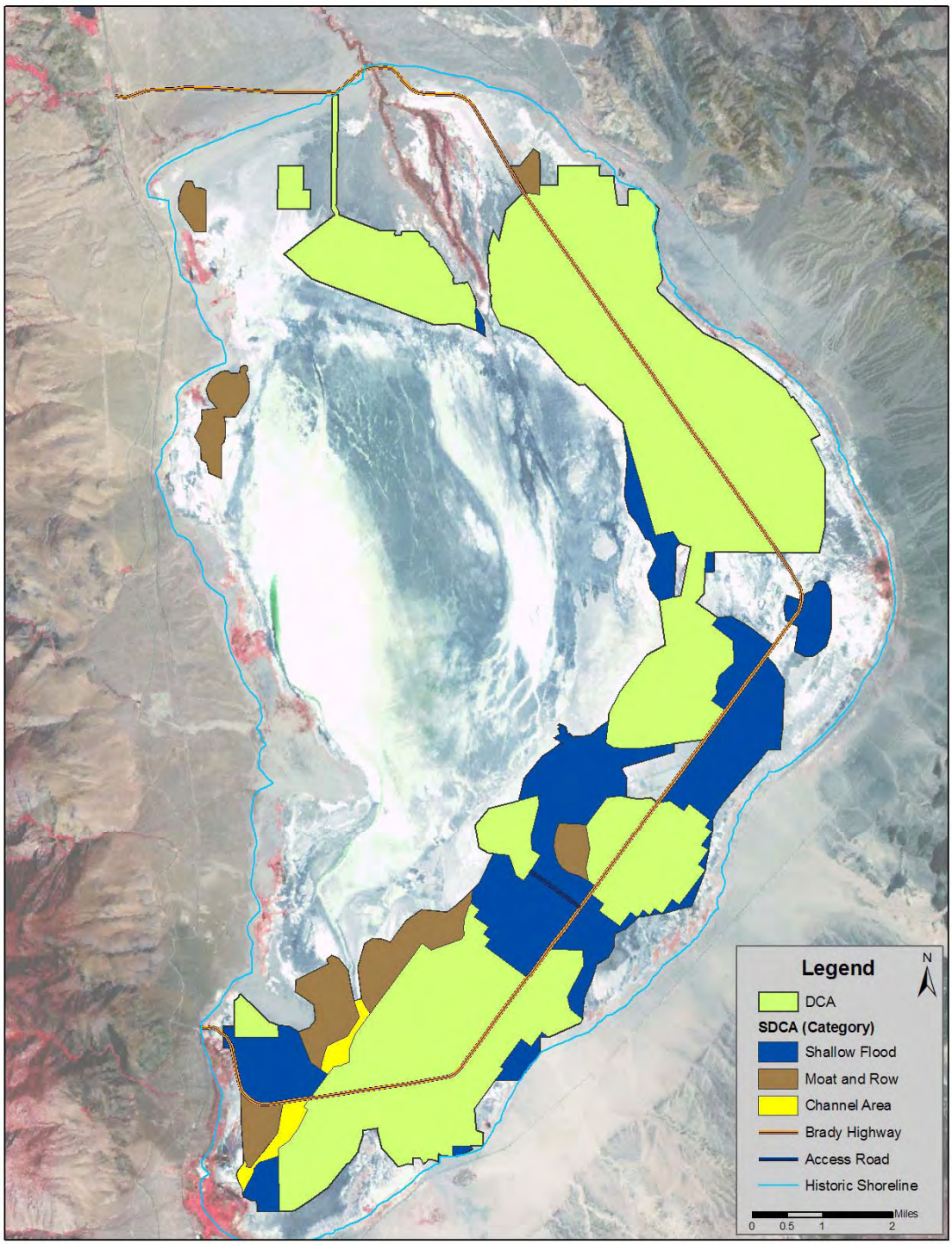

EXHIBIT 4 -- DUST CONTROL MEASURE DESCRIPTIONS

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.

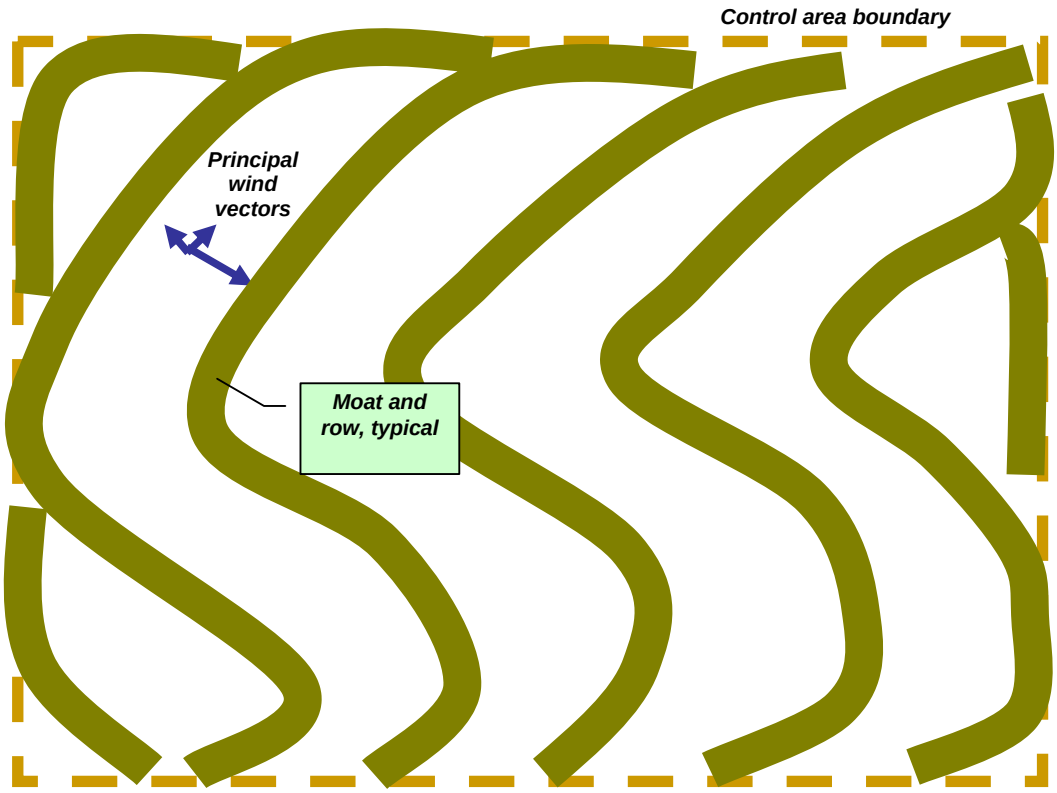

Figure E4-1. Moat and Row Array Plan View (schematic).

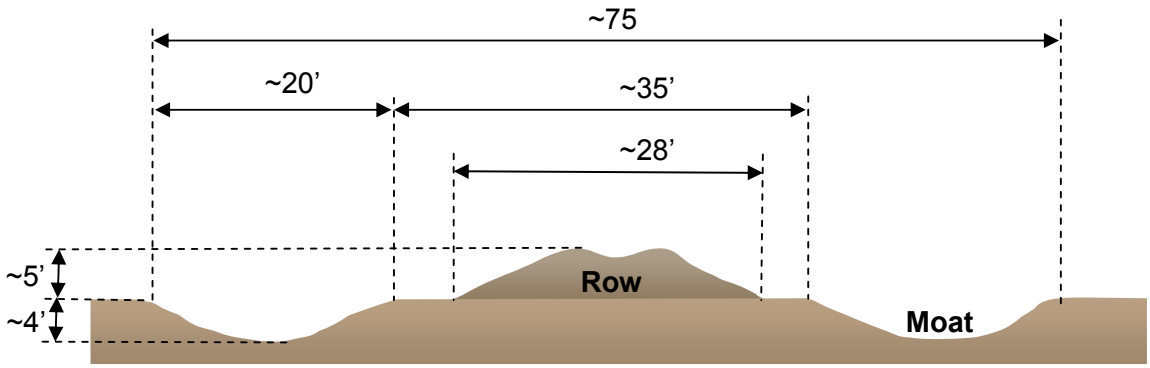

Figure E4-2. Profile of Moat and Row with Approximate Dimensions (schematic).

EXHIBIT 5 -- TDCA MINIMUM DUST CONTROL EFFICIENCY MAP

Shown are MDCEs calculated according to Sections 3 and 4 of the agreement.

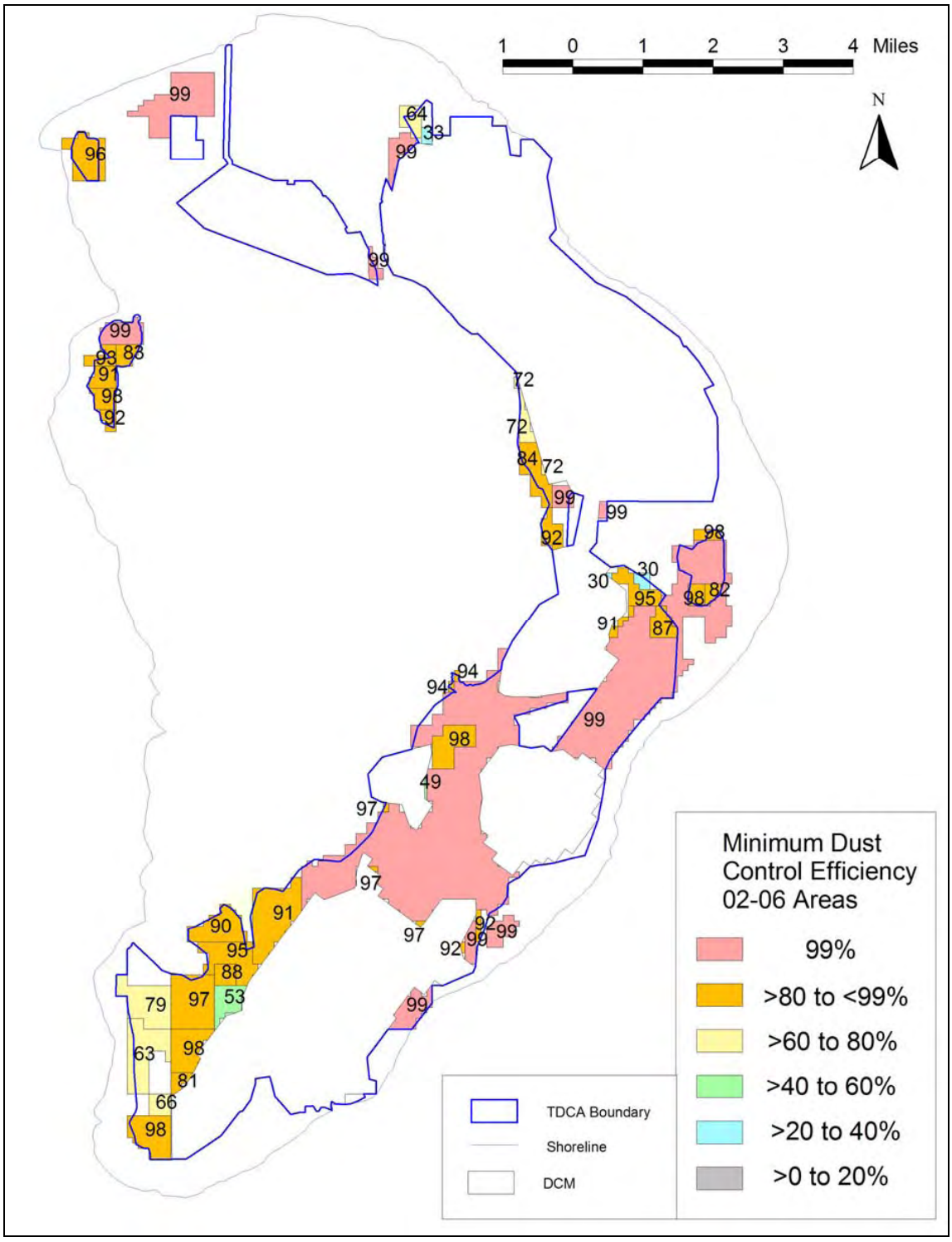

EXHIBIT 6 -- MDCE SELECTION PROCESS

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

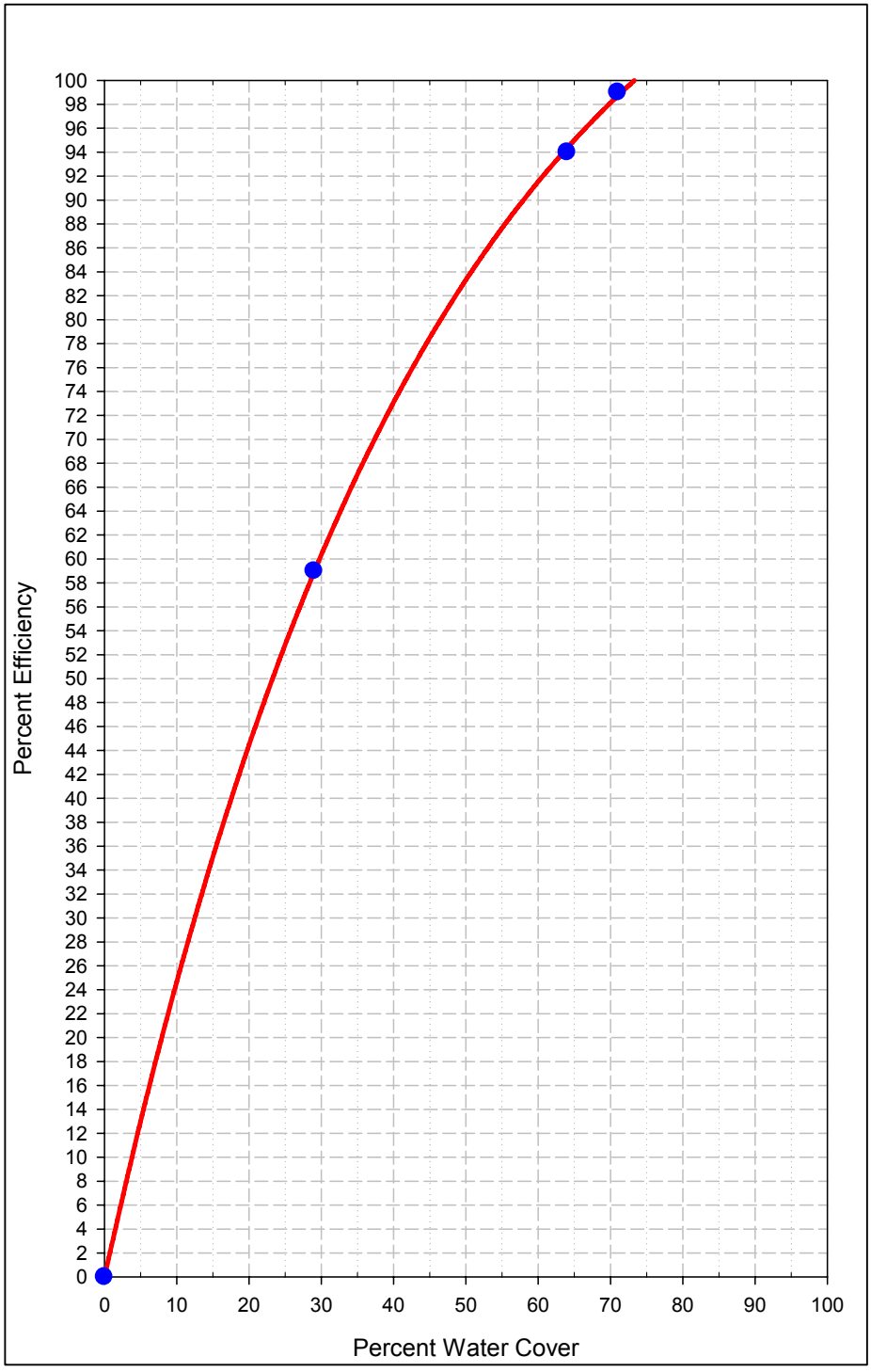

EXHIBIT 8 -- MOAT AND ROW DEMONSTRATION PROJECT LOCATION MAP

Two proposed moat and row demonstration project locations

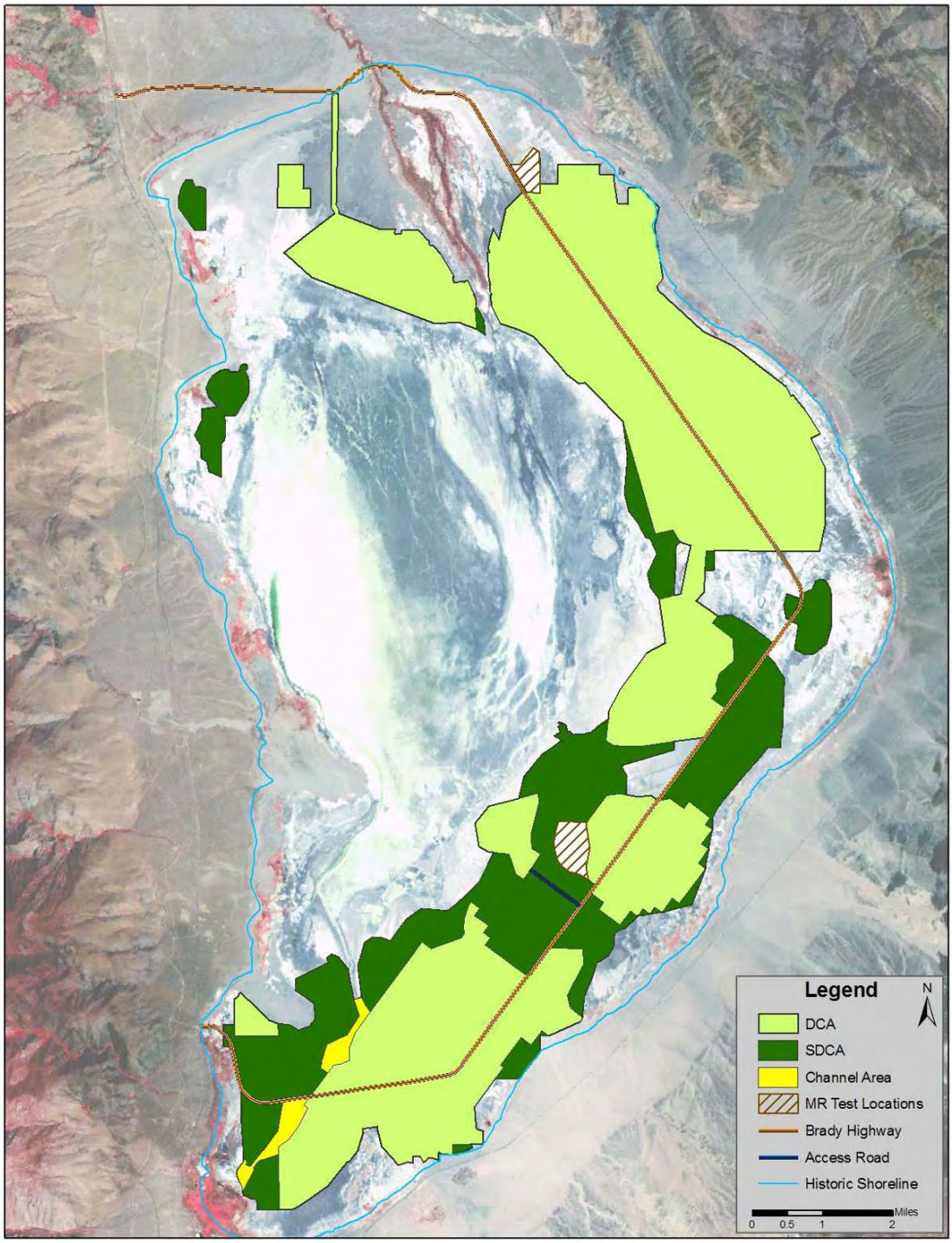

EXHIBIT 9 -- STUDY AREA MAP

Four proposed study area locations

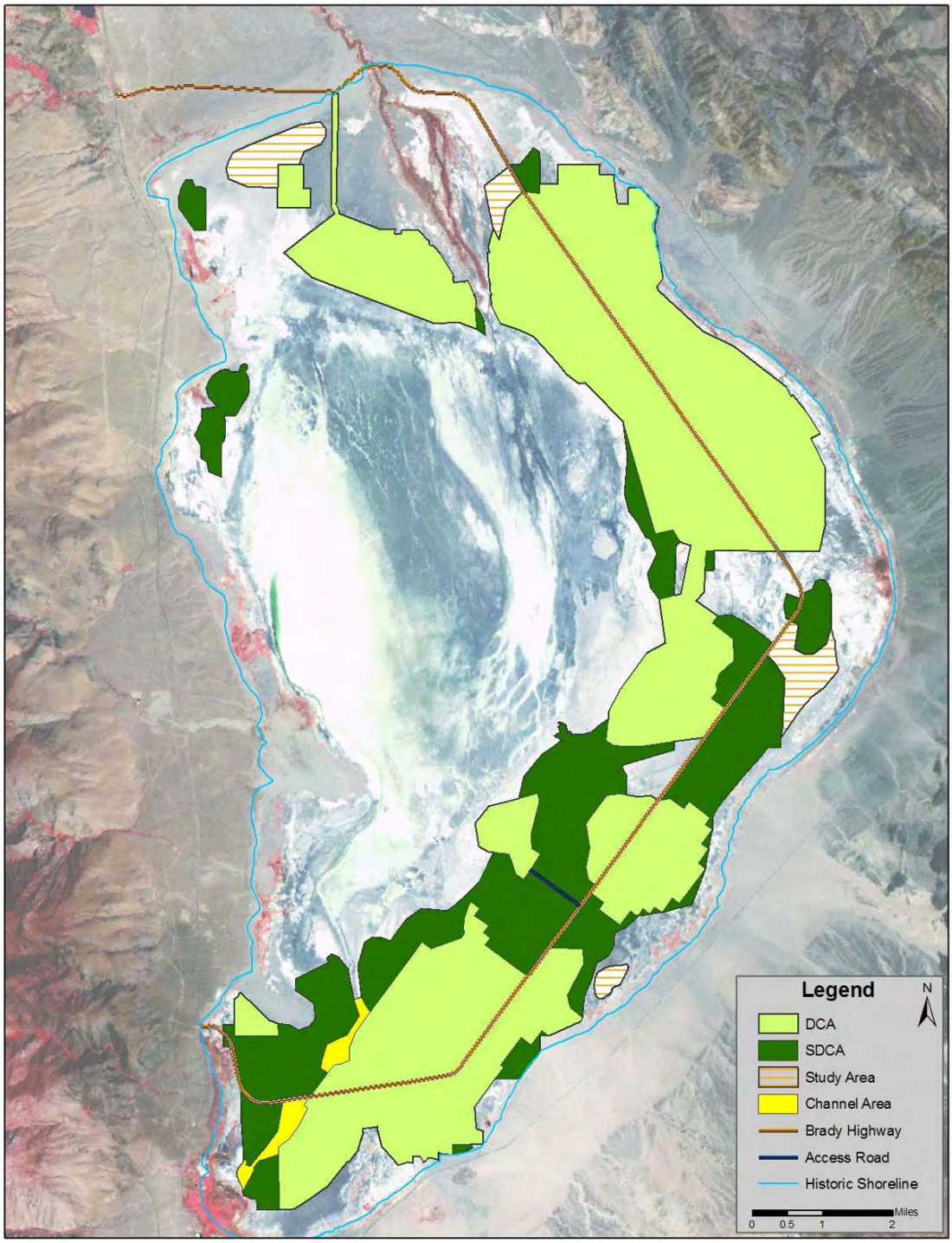

EXHIBIT 10 -- SCHEDULE OF CONTINGENCY MEASURES

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.

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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/m^3.

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.

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?

Source Delineation.

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.

Modeling.

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 µg/m³ for a 24-hour average, go to B.7. If not, go to B.2.

B.2 – Is the modeled concentration less than 100 µg/m³?

This refers to the modeled concentration calculated in B.1 and includes the background PM_{10} level of 20 µg/m³. 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.

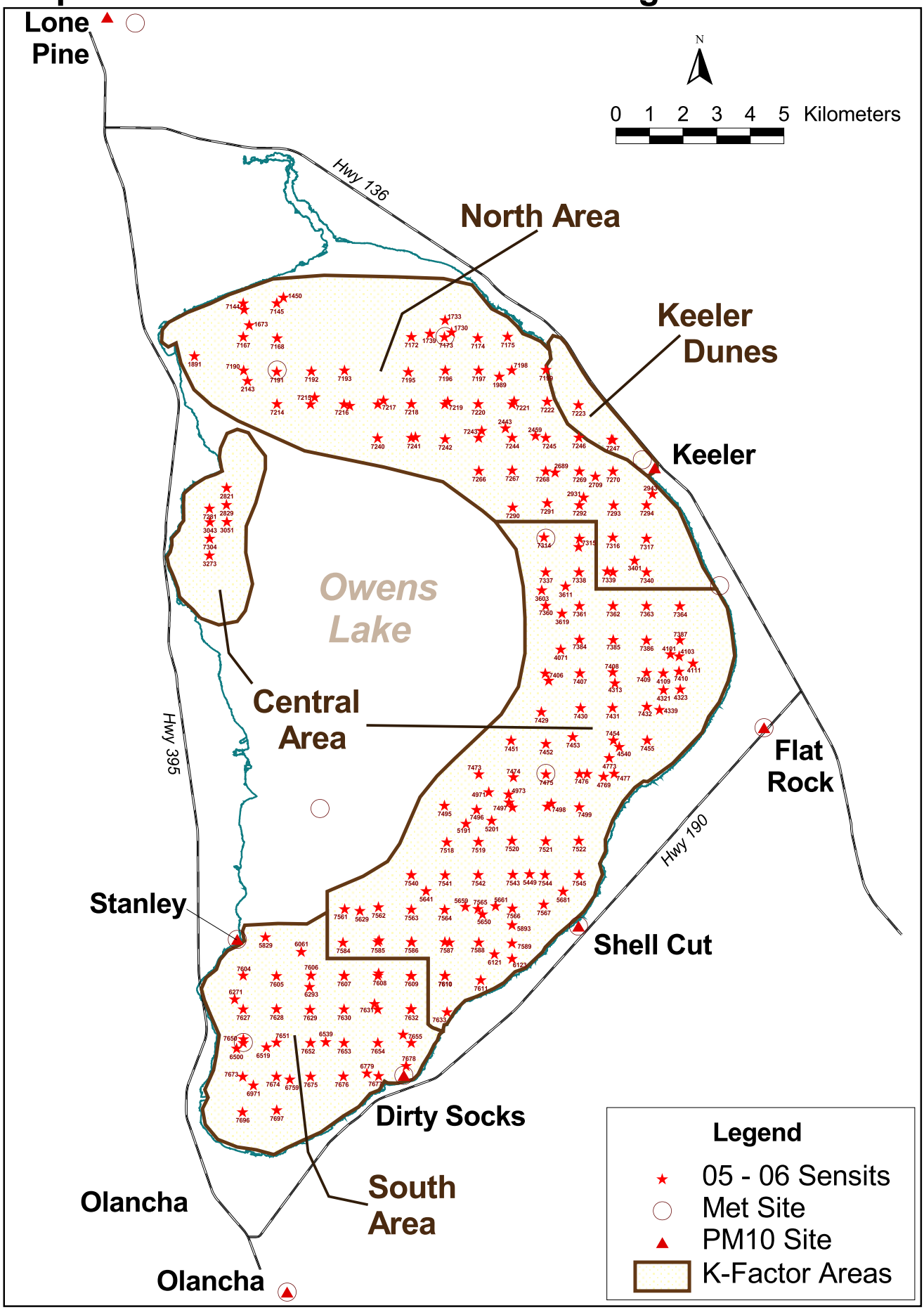
DCMs for new areas will be operational within the times set forth in the DCM Operation Schedule incorporated as Attachment B, Exhibit 3. The City is solely responsible for all environmental impact analyses required by the California Environmental Quality Act and for all required permits and leases.

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.

Attachment B Enclosures

Map 1: Owens Lake Dust ID Monitoring Map
Table 1: From-the-lake and Non-lake Wind Directions for PM_{10} Monitor Sites
Table 2: Default Spatial and Temporal K-factors for the Dust ID Model
Exhibit 1: Schedule of Contingency Measures
Exhibit 2: Moat & Row Transition Schedule
Exhibit 3: DCM Operation Schedule

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}	From-the-Lake	Non-lake	
Monitor Site	Wind Dir. (Deg.)	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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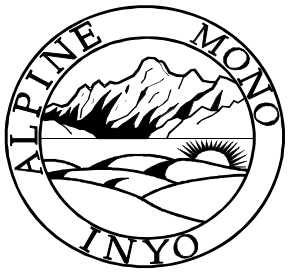
Board Order 080128-01
Attachment C

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

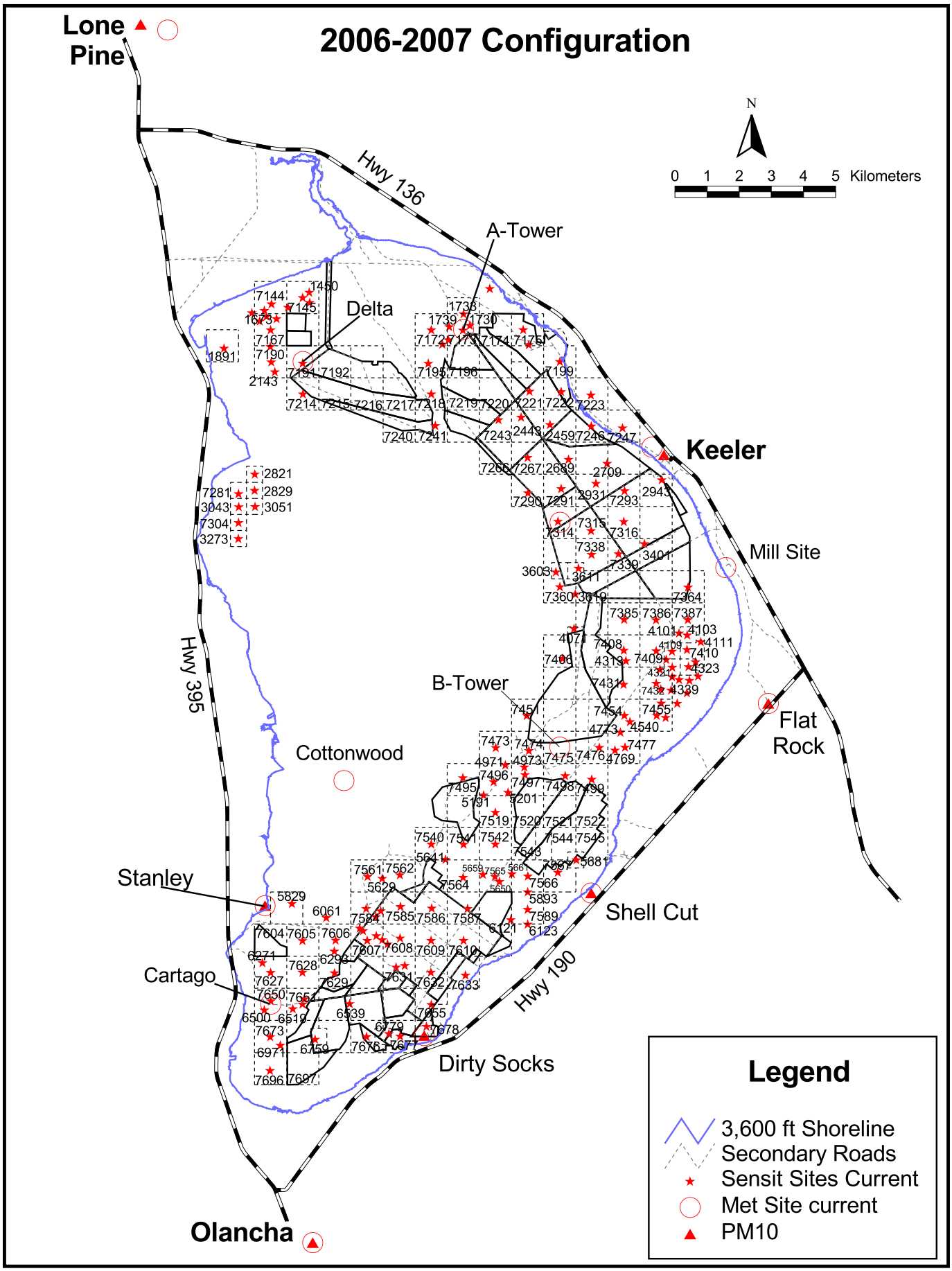

Figure 1.1 - Owens Lake Dust ID monitoring network

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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

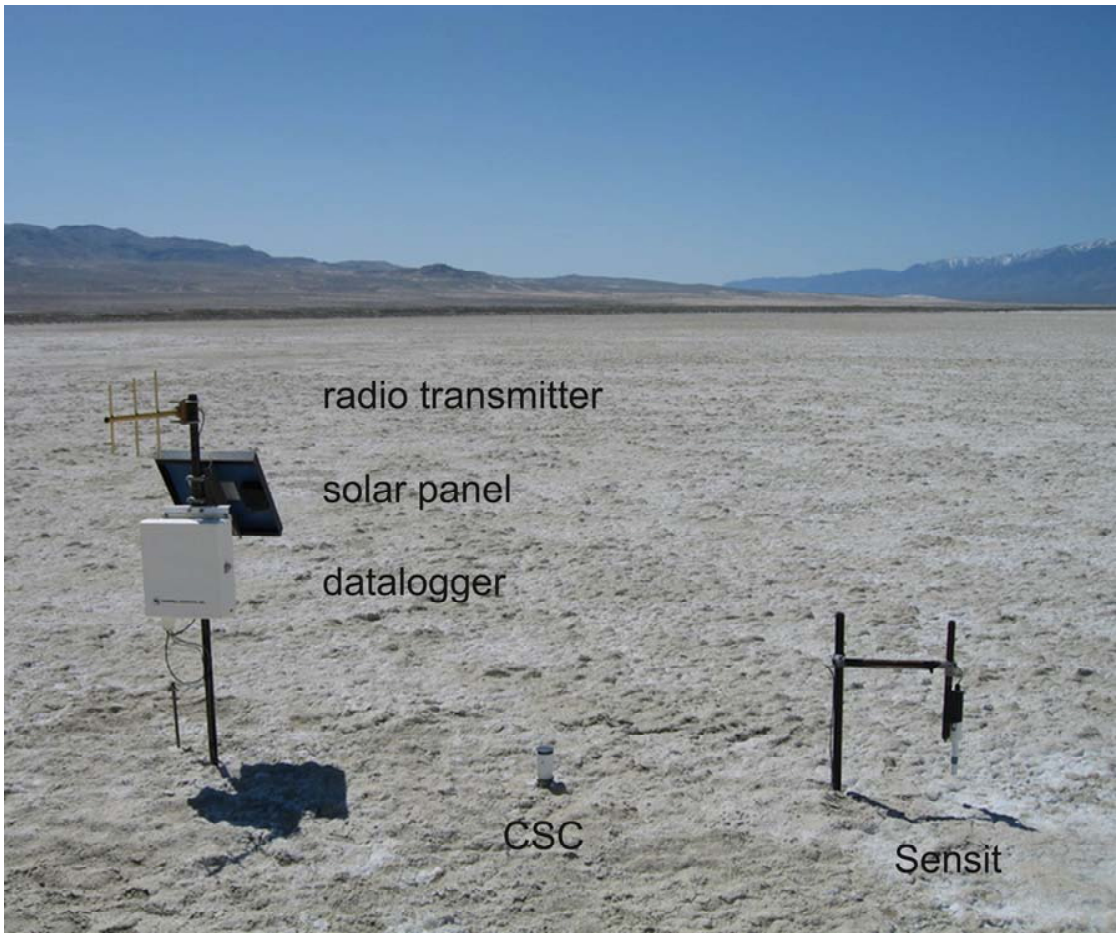

Figure 2.1 - Dust ID sand flux monitor sites measure wind erosion activity using CSCs to collect sand-sized particles and Sensits that electronically detect moving particles. Sensit data are recorded on dataloggers and transmitted by radio from each site to the District's office in Keeler.

Figure 2.2 - Diagram of the Cox Sand Catcher (CSC) used to measure sand flux at Owens Lake.

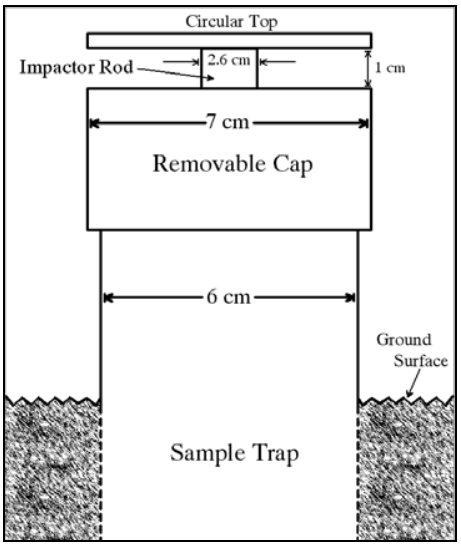

Figure 2.3 - Example of a Cox Sand Catcher (CSC) with the inner sampling collection tube removed.

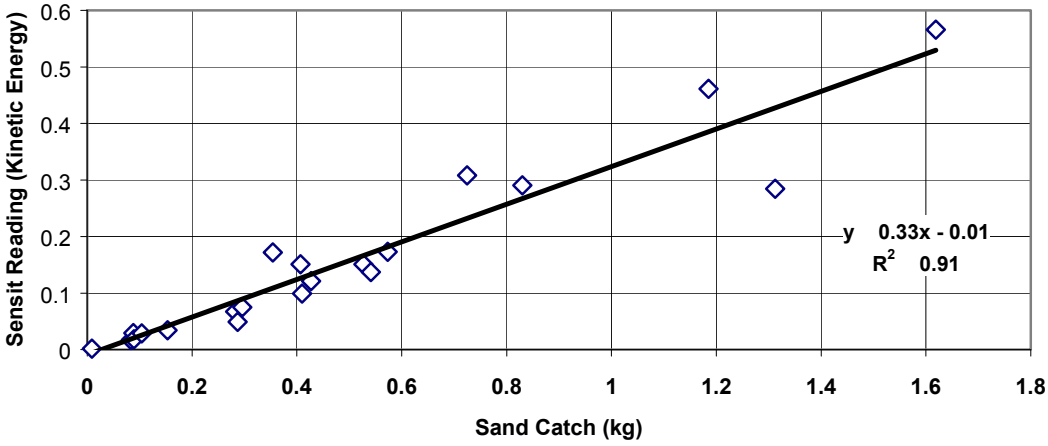

Figure 2.4 - Example of the linearity between CSC mass and a Sensit reading using kinetic energy reading (Sensit No. 7291).

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 ($\pm$ 1 cm), tube tare weight prior to sand catch ($\pm$ 0.001 kg), total sand catch weight ($\pm$ 0.001 kg), and post-catch tube weight ($\pm$ 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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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

$$q_{n,t} = \left(S_{n,t} - S_{n,bg}\right) \times \frac{CSC_{n,p}}{\sum_{t=1}^{N}\left(S_{n,t} - S_{n,bg}\right)} \times \frac{1}{1.2} \quad [g/cm^2/hr]$$

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

$$q_{n,t} = S'_{n,t} \times \frac{CSC_{n,p}}{\sum_{t=1}^{N} S'_{n,t}} \times \frac{1}{1.2} \ [g/cm^2/hr]$$

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

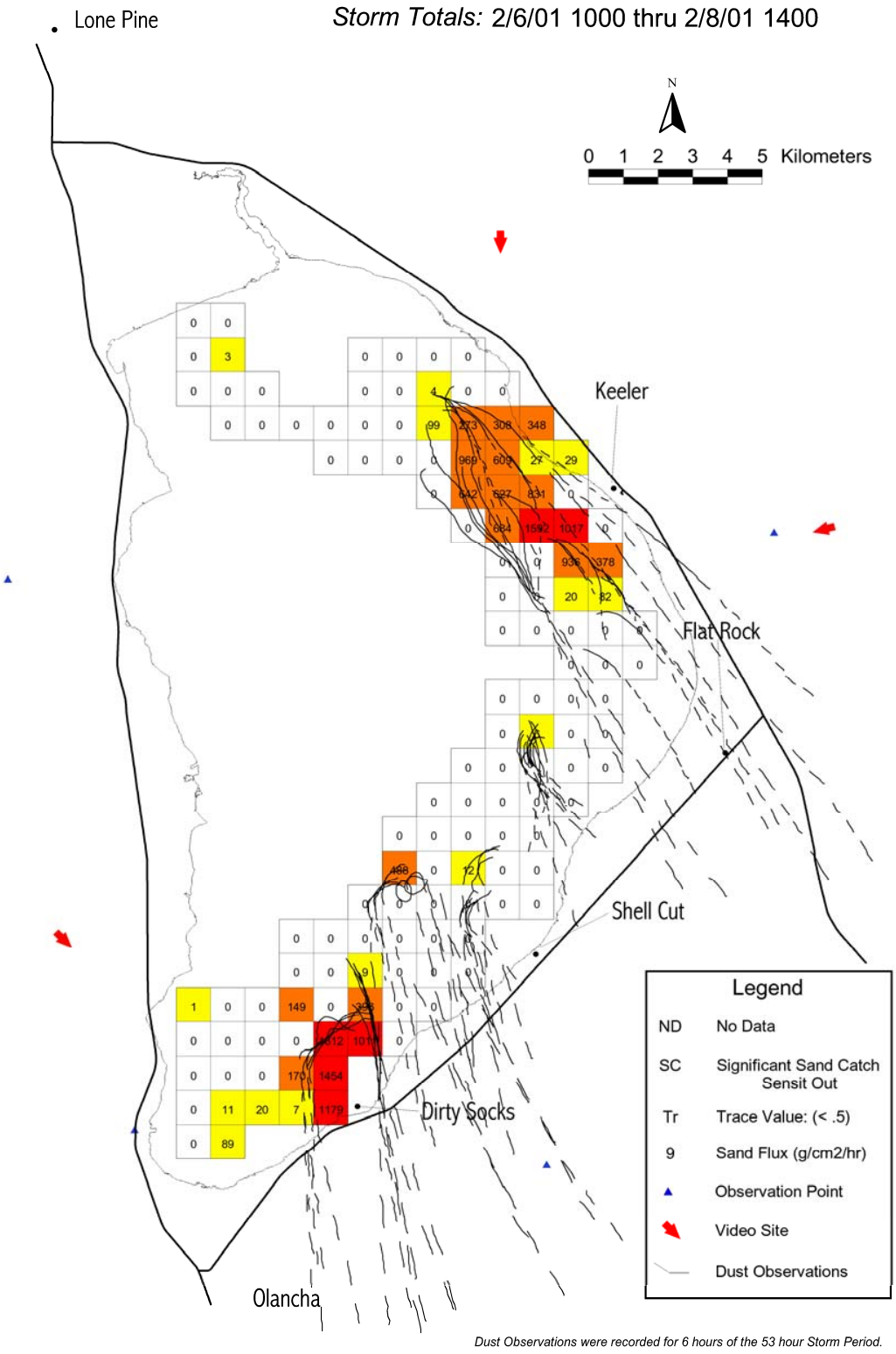

Figure 4.1 - Example of dust plume maps drawn by observers during daylight hours and total sand flux for a dust event on February 6-8, 2001.

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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.

Equation 5.2

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

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:

Initial K-factor Screen

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.

Final K-factor Screen

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.

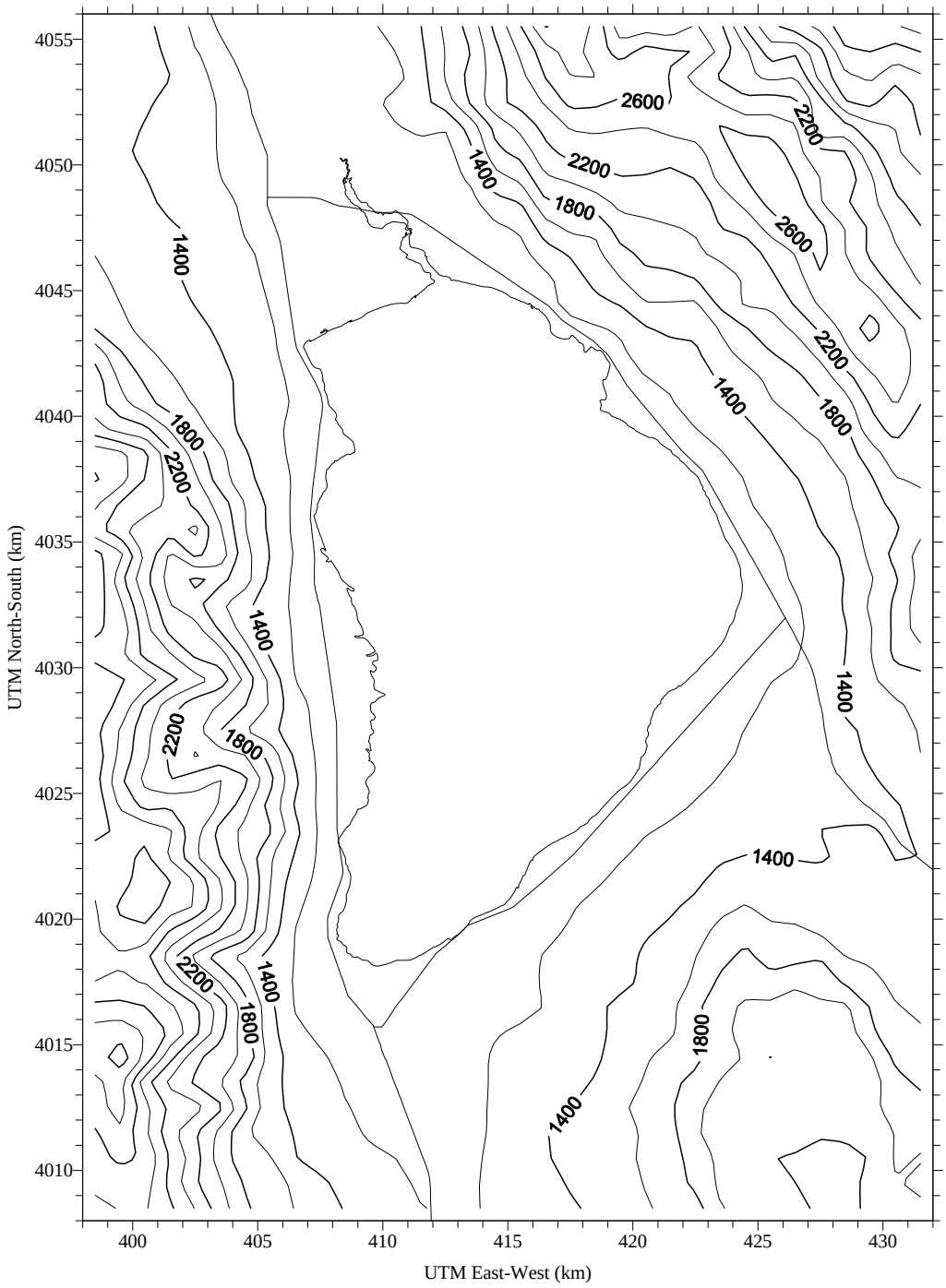

Figure 6.1 - Model Domain, elevation contours and UTM coordinates for the Dust ID Model

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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 µg/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 µg/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 µg/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.

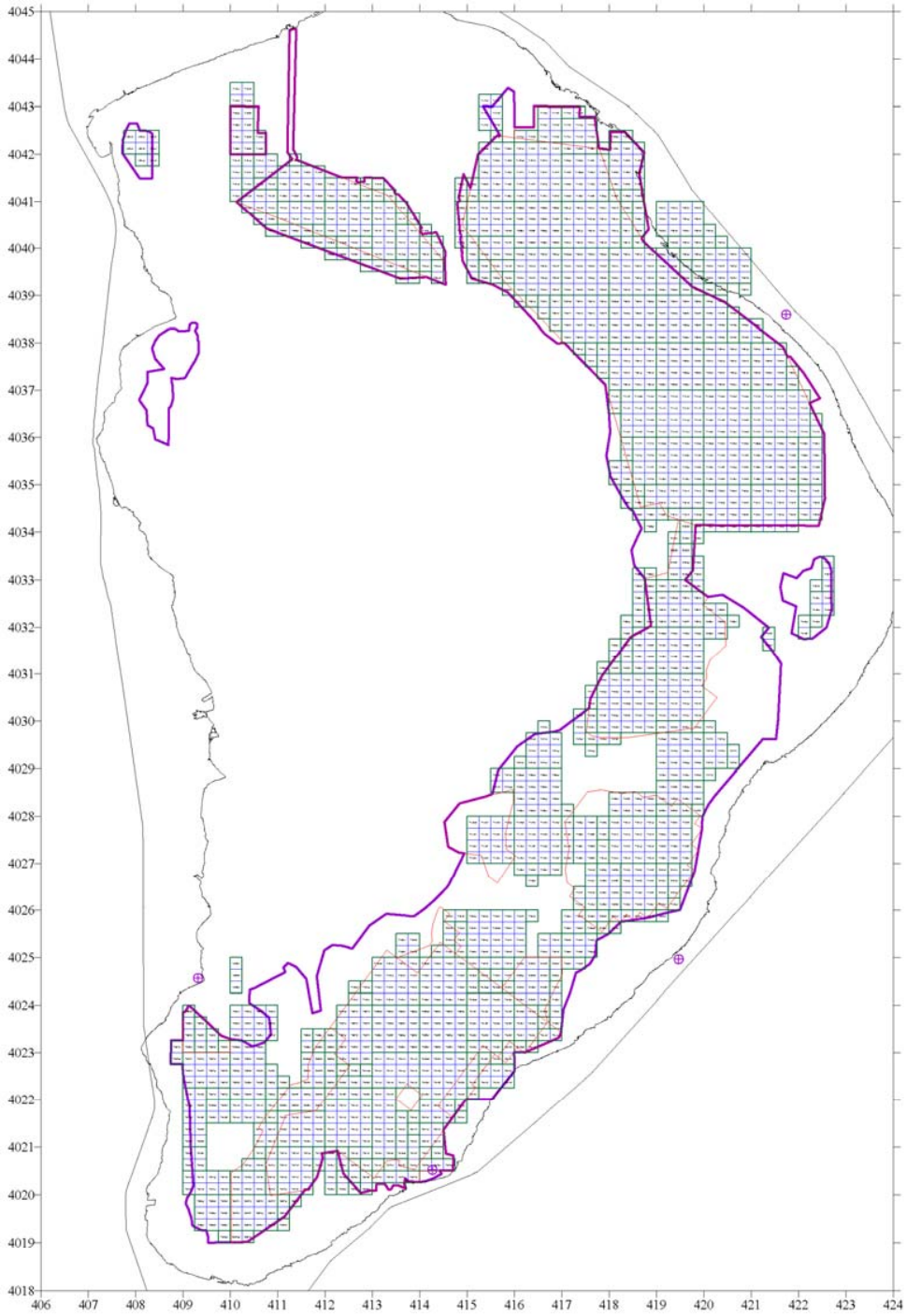

Figure 6.2 - Area source configuration using 250 m x 250 m cells for July 2002 through June 2003 Dust ID model run. Purple lines represent the control area boundary used with the Settlement Agreement.

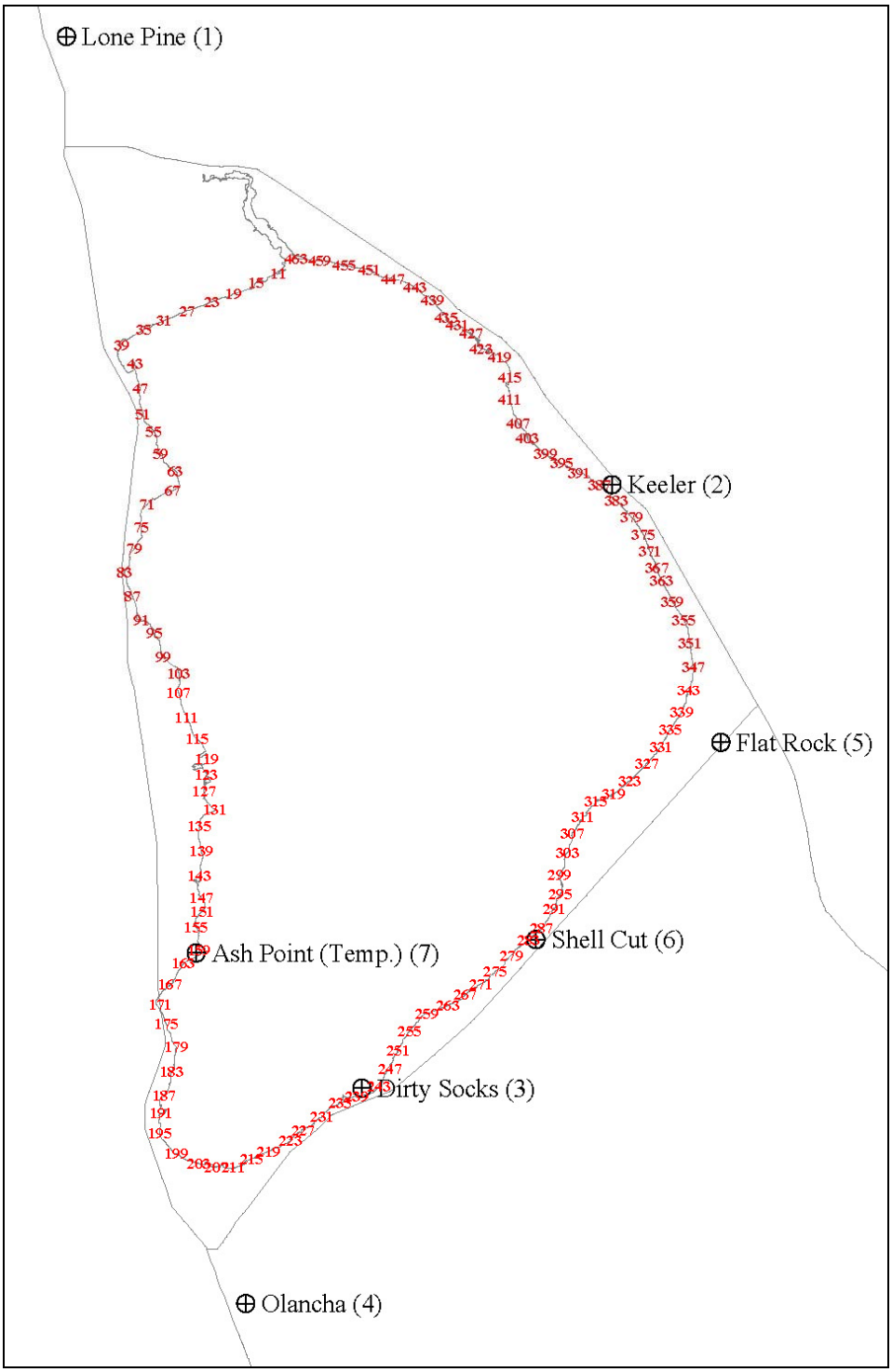

Figure 6.3 -The Dust ID model evaluates PM_{10} impacts at over 460 receptor locations around Owens Lake.

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.

Emergency Assistance Reporting Contacts and Phone Numbers (Area Code 760):

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

Requirements to Begin the Process

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 $\mu g/m^3$) or monitored emissions are increasing above trigger levels set by the APCO based upon a 140 $\mu g/m^3$ 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 $\mu g/m^3$), during the test period is less than 120 $\mu g/m^3$, and

2) no concentrations greater than 120 $\mu g/m^3$ 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 140μg/m^3 modeled (including background of 20μg/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.