Staff Report

ARB Review of PM_{10} State Implementation Plan for Owens Valley

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EXECUTIVE SUMMARY

This report provides Air Resources Board (ARB) staff's assessment of the Great Basin Unified Air Pollution Control District's (District) PM_{10} State Implementation Plan for Owens Valley (2016 Plan). The 2016 Plan was developed to supersede previous state implementation plans (SIP), and comply with the terms of a court-approved 2014 Stipulated Judgment (2014 Judgment) resolving litigation between the District and the Los Angeles Department of Water and Power (City) over the extent and timing of dust control implementation on the Owens Lake dry lakebed. The 2016 Plan forecasts attainment of the PM_{10} national ambient air quality standard (standard) by the end of 2017, a major accomplishment to abate PM_{10} values recorded 30 years ago in excess of 12,000 $\mu g/m^3$ downwind of Owens Lake.

The history of windblown dust at Owens Lake dates back over 100 years to the diversion of the Owens River into the Los Angeles Aqueduct, an engineering marvel of its time. Upon desiccation of the terminal lake that had been fed by the Owens River, Owens Lake was transformed into a brine pool and over 70 square miles of salt-crusted dry lakebed. The lakebed has been a source of windblown PM_{10} since then with emissions rising over time to earn the Lake recognition as once being the largest dust source in North America.

A continuous program of air quality monitoring, lakebed emissivity research, control measure testing, and control application over broad expanses of lakebed surface conducted under H&SC 42316 has greatly reduced windblown PM_{10} emissions and ambient PM_{10} concentrations at Owens Lake, earning the District national recognition. In complying with attainment requirements of the Clean Air Act (Act), the District has adopted a series of SIPs certifying progress, expanding the portion of lakebed found to be emissive and designated for control, and refining and adding approved control measures for use by the City in meeting emission reduction targets.

The 2016 Plan supersedes a number of these previously submitted SIPs and incorporates for implementation many of the requirements of the 2014 Judgment. The 2016 Plan forecasts attainment of the PM_{10} standard by December 31, 2017, the maximum extension allowed by the Act. The 2016 Plan addresses the planning requirements specified under Subpart 4 of the Act that allows for two 5-year extensions of the serious PM_{10} area attainment date to 2017. In complying with these provisions, the 2016 Plan includes a demonstration that most stringent measures are in place and that all commitments included in the 1998 SIP have been fulfilled. Additional Act requirements addressed in the 2016 Plan include reasonable further progress with a corresponding milestone, transportation conformity and contingency measures.

ARB staff has evaluated the 2016 Plan and concluded that it fully satisfies applicable requirements of the Act. ARB staff furthermore has concluded that the requirements of the California Environmental Quality Act (CEQA) are satisfied by actions taken by the District Board in adopting the 2016 Plan. As a result, ARB staff therefore recommends that the Board approve the 2016 Plan as a revision to the California SIP.

I. OVERVIEW

Exposure to particulate matter less than 10 microns in aerodynamic diameter (PM_{10}) is associated with a variety of health problems. Breathing PM_{10} can increase the incidence and severity of asthma and bronchitis attacks, cause breathing difficulties in people with heart or lung disease, and increase the risk for, or complicate, existing respiratory infections. Children, the elderly and people with existing heart and lung problems are especially sensitive to elevated levels of PM_{10}. Even healthy people can be adversely affected by dust at extremely high concentrations.

The Act requires the U.S. Environmental Protection Agency (U.S. EPA) to establish standards to protect public health on a long term basis, and to regularly update these standards to reflect new health information. U.S. EPA first established PM_{10} standards in 1987 - a 24-hour PM_{10} standard of 150 micrograms per cubic meter ($\mu g/m^3$) and an annual standard of 50 $\mu g/m^3$. Based on an extensive assessment and scientific review of the health impacts of PM_{10} pollution, U.S. EPA rescinded the annual standard and retained the 24-hour standard of 150 $\mu g/m^3$ in 1997. Meeting this standard provides critical public health protection, especially in the Owens Lake area which historically has experienced the highest PM_{10} levels in the nation.

The history of windblown dust control at Owens Lake begins in 1983 with intervention by the California Legislature to balance resource protection with air quality improvement. Senate Bill 70 (1983) enacted Health & Safety Code Section 42316 which protects the City's Owens River water right activities from District regulation while simultaneously vesting the District with authority to require the City to mitigate the air quality impacts related to water export and to fund District mitigation measure development costs. Subsequent court decisions upheld this statute and deemed the City responsible for mitigation of PM_{10} emissions from the dried lakebed.

Windblown dust from the Owens Lake dry lakebed and affected areas is the single source of PM_{10} emissions responsible for causing the federal PM_{10} standard to be exceeded in the Owens Valley Planning Area (Owens Valley). Controlling windblown dust emissions on the lakebed has proven to be a very complex undertaking, requiring a multi-decade research effort with respect to the characteristics of emission generation and the effectiveness of candidate control approaches. At each significant juncture in this research effort, the District revised the SIP for the Owens Valley to incorporate new scientific findings and implement new controls when demonstrated to be effective. The PM_{10} State Implementation Plan for Owens Valley (2016 Plan) [1] represents one of these significant junctures – in this case, an expansion of the list of control measures deemed to qualify as Best Available Control Measures (BACM) to include approvable waterless controls, the addition of a process for approving "water neutral" controls, and the addition of a cap on the total expanse of dry lakebed required to be controlled by the Los Angeles Department of Water and Power (City).

[1] *2016 Owens Valley Planning Area PM10 State Implementation Plan*, Great Basin Unified Air Pollution Control District, April 13, 2016. Available at http://www.gbuapcd.org/ovpm10sip.htm

The new elements of the 2016 Plan are being added to satisfy the requirements of the 2014 Judgment that settled several judicial and administrative appeals by the City of past District control orders. For the City, the 2014 Judgment allows for reductions in the quantity of Owens River water being diverted for dust control during the current statewide drought and establishes a limit on the lakebed area to which the City may be required to apply BACM. For the District, the 2014 Judgment streamlines the process for having the City implement BACM after the District issues orders for bringing new areas under control, and assures District use of City property and electricity for monitoring station operation.

A. Owens Valley Planning Area

The Owens Valley is located in Inyo County in eastern-central California. The Valley is approximately 68 miles long and 20 miles wide, with the long axis extending along a NNW-SSE azimuth. Owens Lake lies in the southern half of the Owens Valley, approximately 8 miles south of the town of Lone Pine and 60 miles north of the city of Ridgecrest.

The Owens Lake dry lakebed is almost entirely owned by the State and the City. The State's portion of the lakebed, constituting about 65,000 acres or 89 percent, is managed by the California State Lands Commission (CLSC). The remainder of the lakebed, consisting of about 8,000 acres or 11 percent, is managed by the City's Department of Water and Power.

B. Regulatory History

On August 7, 1987, U.S. EPA identified the Owens Valley as one of the areas in the nation that violated the standards and required the State of California to prepare a State Implementation Plan (SIP) revision that demonstrated how PM10 emissions would be reduced to comply with the standards.

Subsequent to this date, the District adopted a series of SIPs as understandings of lakebed emissivity and control evolved. In summary, these SIPs:

- (November 1991) Updated technical data and work performed since 1988;
- (June 1994) Identified potential control alternatives and committed to the testing and selection of measures satisfying emission reduction targets;
- (July 1997) Approved three BACM and required the City to control 35 square miles of lakebed surface by 2002;
- (November 1998) Revised control requirements to 16 square miles by 2004 and 2 square miles per each year afterward until attainment was reached, committed to the development of a better emission and air quality models, and required revision of the SIP in 2003 to incorporate the new models;

- (November 2003) Approved the Dust ID model for emissions and air quality forecasting, required the City to control an additional 13.3 square miles by 2007, and approved the Supplemental Control Requirement Determination (SCRD) process for the annual identification and control of additional emissive lakebed areas;
- (January 2008) Required the City to control an additional 12.7 square miles by 2010, and suspended annual SCRD evaluations until 2011;
- (September 2013) Approved two additional BACM, and relieved the City of responsibility for dust control on off-lake sand dunes in exchange for payment by the City of $10 million to the District for dust control on Keeler Dunes; and
- (April 2016) Approved one additional BACM, authorized the City to convert controlled area to waterless BACM on an accelerated basis, and capped the total lakebed area to which the City could be required to control to 53.4 square miles.

C. Nature of PM_{10} Air Quality in the Owens Valley

Owens Lake has historically been referred to as the dustiest location in North America. This distinction results from a combination of topographic features and the historic diversion of the Owens River into the Los Angeles Aqueduct. The Aqueduct commenced operation in 1913, eliminating the primary inflow to Owens Lake. By 1927, the 110 square mile lake surface had shrunk to a 35 square mile brine pool, leaving more than 70 square miles of dry lakebed composed of fine grained sediment, salt and sand.

The dry lakebed is exposed to high wind events several times each year that historically scoured the surface and entrained fine particulate matter from the lakebed into the air. Wind speeds at Owens Lake are enhanced by the eastern walls of the Sierra Nevada, reaching elevations of nearly 11,000 feet above the lakebed surface. The steepness and height of the Sierra Nevada slope to the west, in combination with the Inyo Mountains in close proximity and immediately to the east of Owens Lake, produce strong descending eddies as prevailing winds pass eastward over the Sierra Nevada. The juxtaposition of the two mountain ranges creates the long, narrow Owens Valley, which channelizes and increases the velocities of wind flows moving north and south along the valley floor. The strength of these winds and the fine granularity of lakebed surface soils generated thick clouds of fine particles that, in the past, contained PM_{10} concentrations of up to 40,000 $\mu g/m^3$ – almost 300 times the federal 24-hour PM_{10} standard of 150 $\mu g/m^3$.

Research conducted in the late 1980s and early 1990s found two mechanisms were responsible for the bulk of windblown dust emissions: the formation of efflorescent salts on the lakebed surface after precipitation episodes and the movement of sand particles across the lakebed surface during high wind events. The understandings gained through the extensive source characterization research conducted at Owens Lake framed the initial goals of dust control measures: to maintain surface moisture during the wet season to prevent efflorescent salt formation or shield these formations from

wind shear, and to stabilize sand particles on the lakebed surface to eliminate saltation during high wind events.

II. ATTAINMENT DEMONSTRATION

District staff has prepared an attainment demonstration that provides for expeditious attainment of the standards accounting for primary emissions from the lakebed and secondary emissions resulting from re-entrainment of deposited lakebed dust on nearby downwind areas. The attainment demonstration uses the Dust ID model that the District has relied upon since 2003 to identify emissive lakebed areas and to quantify windblown emissions and shoreline impacts. The controls that have been constructed and maintained on lakebed areas identified through use of the Dust ID model have reduced annual lakebed PM_{10} emissions by 97 percent between 2001 and 2015, supporting the adequacy and effectiveness of the Dust ID model's use.

A. Modeling Methodology

The Dust ID model is used to both estimate emissions from discrete lakebed areas and forecast the air quality impacts of these emissions at the lakebed shoreline and beyond. The emission estimation component uses sand movement data collected by a network of monitors scattered across the lakebed surface to calculate zone-specific PM_{10} emission rates using seasonally-adjusted conversion factors. The input file is used by a CALPUFF model, a U.S. EPA-approved dispersion model designed to handle complex wind fields and highly variable emission sources, to forecast PM_{10} concentrations at each of the seven shoreline PM_{10} monitors and at closely spaced shoreline points in between.

The baseline period used for emission tracking in the 2016 Plan's attainment demonstration extended from June 2009 through June 2014, the most recent five years of Dust ID model input and output analyzed by the District. During this baseline period, the number of exceedances of the 24-hour PM_{10} standard recorded at each of ten monitors operated near the lakebed ranged from 1 (Lone Pine) to 42 (Lizard Tail), with maximum 24-hour PM_{10} concentrations at each monitor ranging from 169 to 4,571 $\mu g/m^3$. Design day concentrations calculated for each station ranged from 180 to 1,654 $\mu g/m^3$. The attainment demonstration focused on these design days, but modeled the entire 5 years of baseline meteorological data for weight-of-evidence purposes.

Analysis of PM_{10} concentrations measured at shoreline monitors when winds blow to the lakebed from off-shore areas show declining trends as lakebed emissions decline. This result suggests that dust entrained from these off-shore lands most likely was transported from the lakebed during high wind events and settled out of the air within two kilometers downwind of the shoreline. Although a small number of 24-hour PM_{10} exceedances are presently caused by emissions from these non-lakebed lands (2-km buffer), this frequency is forecast to decline to attainment levels by the current deadline as less and less dust is transported from the lakebed to these off-shore lands.

B. Baseline and Attainment Emission Levels

Table 1 lists the emissions levels used in the attainment demonstration. Baseline emission levels – represented by 2008 emissions - reflect the benefits of lakebed controls in place as of the start of the 2009 to 2014 baseline period. Attainment emission levels are represented by 2017 emissions forecasts and incorporate the benefits of scheduled controls.

Table 1. Annual Baseline and Attainment Year PM_{10} Emissions (tons per year)

Emission Inventory	Annual PM_{10} Emissions (tpy)	
	2008	2017
Lakebed Windblown Emissions	22,754	355
Off-Lake Windblown Emissions		
Keeler Dunes	2,130	41
Olancha Dunes	4,487	1,093
2-km Buffer	2,736	1,180
Remaining Nonattainment Area,	20,033	20,033
Non-Windblown Emissions	854	747
TOTAL	53,994	23,450

C. Results

The attainment demonstration results are shown in Table 2. This table presents two sets of comparisons: the measured baseline design day PM_{10} concentration at each monitor in conjunction with the concentration forecast by the Dust ID model, and the attainment year design day PM_{10} concentration. The baseline period extends from July 2009 through June 2014. By the results of attainment demonstration modeling, all former and current monitoring sites near the lakebed are forecast to attain the 24-hour PM_{10} standard of 150 $\mu g/m^3$. These results range from 39 to 142 $\mu g/m^3$.

Table 2. PM_{10} Design Day Concentration Predictions (24-hour average micrograms per cubic meters)

Monitoring Site	Design Day 24-Hour Average PM_{10} ($\mu g/m^3$)		
	Observed	Modeled Concentration Predictions	
	7/2009 – 6/2014	7/2009 – 6/2014	2017
Dirty Socks	998	1,235	93
Flat Rock	233	228	94
Keeler	524	592	67
Lizard Tail	1,654	1,993	142
Mill Site	712	642	125
North Beach	385	448	67
Olancha	310	294	41
Shell Cut	395	586	105
Stanley	180	115	39

III. CONTROL STRATEGY

The control strategy proposed in the 2016 Plan is an extension of those adopted in the 1998, 2003, 2008, and 2013 Plans that has proved to be effective when applied to emissive lakebed areas. The District protocols for identifying emissive areas, constructing and maintaining BACM controls, and enforcing the long term effectiveness of these controls, are based on an comprehensive research and testing program that underpin a windblown dust control program that is recognized nationally for its success.

The BACM controls adopted in the 1998 Plan – shallow flooding, managed vegetation, and gravel blanket – have been applied to 76 percent of the lakebed surface to which windblown dust controls are currently being applied. Newer, less water-dependent BACM controls approved by the District since 2013 are in place on the remaining 24 percent of currently controlled areas. Table 3 shows the cumulative areas at present and by the attainment deadline of December 31, 2017, per BACM type.

Table 3. BACM Area Totals (square miles of lakebed surface)

BACM Type	Controlled Area (square miles)	
	Present	2017
Shallow Flooding	27.9	28.4
Managed Vegetation	3.5	3.8
Gravel Blanket	3.2	6.0
Hybrid BACM	4.7	4.7
Tillage with BACM Backup	4.5	4.5
Experimental	0.9	0.9
Brine Test	0.8	0.8
TOTAL	45.4	49.0

The 2016 Plan authorizes the City to convert areas currently controlled by Shallow Flooding to less water-dependent BACM, such as Tillage with BACM Backup, provided that the construction activities occur only during those months of the year when water applications are not required by Shallow Flooding BACM. As a result, the control area totals by BACM type shown in Table 3 for the attainment deadline (2017 Year-End) may well be redistributed after attainment as the City converts from Shallow Flooding to other BACM to reduce overall water consumption by the dust control program.

The current implementation schedule requires completion of construction of controls on all areas designated for control by December 31, 2017. The attainment year emission forecast is based on this assumption for lakebed areas, and an extrapolation of the declining emissions estimates is used to forecast emissions from the off-shore areas.

IV. CLEAN AIR ACT REQUIREMENTS

In addition to the elements related to the attainment demonstration, the Act also requires SIPs for serious PM_{10} nonattainment areas requesting an attainment date extension to address the following requirements:

- Demonstration that the State complied with all requirements and commitments pertaining to the area in the SIP;

- Provisions to assure that the best available control measures/best available control technology (BACM/BACT) for the control of PM_{10} and PM_{10} precursors be implemented no later than four years after area reclassification to serious;

- Inclusion of the most stringent measures (MSM) that are included in the implementation plan of any state or are achieved in practice in any state, and can feasibly be implemented in the area;

- Inclusion of base year emission inventories and future year forecasts for manmade sources of PM_{10} and PM_{10} precursors;

- Annual reductions of emissions equal to or in excess of five percent of baseline levels until attainment is reached;

- Plan provisions that require reasonable further progress (RFP) and quantitative milestones;

- Provisions for sufficient contingency measures for RFP and attainment; and

- Transportation conformity emission budgets to ensure transportation plans and projects are consistent with the SIP.

A. Demonstration of Compliance with Prior SIP Commitments

The 1998 Plan contained an implementation program designed to dynamically adjust BACM design and lakebed coverage requirements, and attain the PM_{10} standards by December 31, 2006. The commitments made in the 1998 Plan to achieve these goals were:

- Completion of the first increment of BACM implementation on 16.5 square miles of lakebed surface by December 31, 2003, unless the District found that attainment would be achieved by controlling a smaller area;
- Completion of the second increment of BACM implementation, if required, on sufficient lakebed surface to reach attainment by December 31, 2006;

- Revision of the 1998 Plan by December 31, 2003, to incorporate new information on emissions and controls, and require implementation of appropriate BACM to reach attainment by December 31, 2006 if standards were not attained by December 31, 2003; and
- Assure RFP by completing BACM implementation on 10 square miles by December 31, 2001; an additional 3.5 square miles by December 31, 2002; an additional 3.0 square miles by December 31, 2003; and an additional 2.0 square miles in each succeeding year until December 31, 2006, unless attainment was achieved earlier.

The 2016 Plan documents that all prior commitments have been met.

B. Significant Source Categories

The Act requires areas designated as serious nonattainment for PM_{10} to implement BACM and BACT for all significant sources of PM_{10} or PM_{10} precursors, such as oxides of nitrogen, reactive organic gases, and ammonia. The District concludes in the 2016 Plan, and the research studies in Plan appendices confirm, that PM10 precursors do not contribute significantly to PM10 concentrations measured during high wind events, the sole meteorological condition under which the PM_{10} standard is exceeded in the Owens Valley. The emission inventory in the 2016 Plan also confirms that only windblown PM_{10} sources are significant in the nonattainment area and subject to BACM controls.

The methodology used to determine the emission threshold for source significance in the 2016 Plan is the application of an air quality scaling factor to the emission inventory for the Owens Lake Subarea. The Owens Lake Subarea is designated in the Plan as the lakebed surface area plus the area within the 2-km buffer zone surrounding the lakebed. From District analysis, this is the area from which windblown PM_{10} emissions cause exceedances of the PM_{10} standard at near-lakebed monitors. PM_{10} monitors outside this area did not report violations of the standard in the baseline period of 2012 through 2014.

Following U.S. EPA guidance setting an air quality impact of 5 $\mu g/m^3$ as a significant contribution in relation to the 24-hour standard of 150 $\mu g/m^3$, the District divided this 5 $\mu g/m^3$ benchmark by the level of the standard to create an air quality scaling factor for calculating an emission level of significance. When the scaling factor was applied to the emission inventory of a design day that minimally exceeded the 24-hour standard, only two source categories were found to exceed the resulting significance threshold: windblown dust from lakebed surfaces, and windblown dust from near-lakebed sand dunes. On this basis, the 2016 Plan focused the analysis of BACM exclusively on these two sources.

C. Best Available Control Measures and Most Stringent Measures

Since 1989, the District has pursued a comprehensive research and testing program to develop windblown PM_{10} control measures that are effective in the unusual Owens Lake

playa and sand dune environment. The three original BACM measures contained in the 1998 Plan - that are carried forward with little change into the 2016 Plan - were approved by U.S. EPA on September 3, 1999. The 2016 Plan also includes two BACM controls approved in the 2013 Plan and includes two being approved as BACM for the first time in an Owens Valley plan. An analysis contained in the 2016 Plan demonstrates that no other PM_{10} SIP or PM_{10} control regulation adopted by another California district or other state is more stringent with respect to control efficiency than the BACM controls approved in the 2016 Plan.

Serious PM_{10} nonattainment areas that cannot achieve the standard by the serious area attainment date are allowed to request a five-year attainment date extension if BACM has been implemented on all significant sources and the plan is amended to demonstrate the identification and implementation of MSM for significant sources. The Act specifies that MSM is the maximum degree of emission reduction that has been required or achieved from a source or source category in other SIPs or in practice in other states and is feasible for implementation on significant sources in the subject nonattainment area. An analysis contained in the 2016 Plan demonstrates that the BACM controls approved in the Plan provide the maximum degree of emission reduction of any control included in a state PM_{10} SIP or achieved in practice on the areal scale of Owens Lake emission lakebed surfaces.

D. Emissions Inventory

SIPs must contain base-year inventories for PM_{10} and significant PM_{10} precursor emissions as well as future year forecasts for these emissions. An emission inventory consists of a systematic listing of the sources of air pollutants with estimates of the quantities of pollutant emissions from each source or source category over specified time periods.

District staff and contractors jointly prepared annual PM_{10} emission inventories and design day 24-hour inventories to demonstrate RFP and attainment in the 2016 Plan. These inventories include a category-by-category review and update using the most recent information available on emissions-generating activities in the nonattainment area.

E. Reasonable Further Progress and Quantitative Milestones

The Act requires SIPs to commit to the steady reduction of emissions between the base year required of the plan and the forecast attainment year. This requirement is referred to in the Act as RFP. As part of this requirement, a SIP must include quantitative milestones to be achieved every three years until the area is redesignated to attainment and which demonstrates RFP. The 2016 Plan identifies the attainment year of 2017 as the only milestone year for SIP RFP planning purposes and quantitative milestone requirements. The District commits in the 2016 Plan to submit to U.S. EPA within 90 days after this milestone date a demonstration that the forecast emissions reductions have been achieved.

F. Contingency Measures

SIPs are required by the Act to contain contingency measures that provide additional emission reductions in the event a nonattainment area fails to achieve RFP targets or attain the PM_{10} standard by the attainment date. These contingency measures are to take effect without further ARB or District action and consist of reductions that are not required as part of the attainment demonstration. The 2016 Plan includes by reference the SCRD program that was adopted as the contingency measure in the 2008 Plan. The SCRD program requires the District APCO to annually evaluate PM_{10} monitoring data and area-specific emissions estimates provided by the Dust ID model and to determine whether any controlled or uncontrolled lakebed area generated sufficient windblown dust emissions to cause an exceedance of the PM_{10} 24-hour standard at a shoreline location. On the basis of SCRD analysis, the District APCO can unilaterally order the implementation of BACM controls on uncontrolled lakebed areas to assure maintenance of the standard.

G. Transportation Conformity

Under section 176(c) of the Act, transportation activities that receive federal funding or approval must be fully consistent with the SIP. U.S. EPA's transportation conformity rule exempts nonattainment areas from the requirement to provide a regional emissions analysis if the SIP demonstrates that regional motor vehicle emissions are an insignificant contributor to the air quality problem addressed in the SIP. The 2016 Plan, through analysis of emission inventory source categories, concludes that motor vehicle emissions are an insignificant portion of the design day emission inventories for the nonattainment area.

V. ENVIRONMENTAL IMPACT

The 2014 Judgment upon which the control strategy of the 2016 Plan is based requires the City to prepare all environmental documentation for actions required by the Judgment. In 2015, the City approved the Final Environmental Impact Report for the Owens Lake Dust Mitigation Program – Phase 9/10 Project (Phase 9/10 EIR) which analyzes the environmental impacts of BACM implementation on lakebed areas designated for control by December 31, 2017 by the 2014 Judgment. These areas and the BACM considered are the same as those contained in the 2016 Plan. The District Board, prior to approving the 2016 Plan, approved the Phase 9/10 EIR as the document satisfying CEQA requirements for the 2016 Plan.

VI. SUMMARY AND RECOMMENDATION

The 2016 Plan builds upon the foundation of a continuous program of monitoring, research, testing, and implementation of windblown dust controls covering more than 30

years at Owens Lake. The progress achieved in emissions reductions and air quality improvement serves as a testament to the success of this program. After evaluation of the 2016 Plan, ARB staff has determined that the 2016 Plan satisfies the requirements of the Act and therefore recommends that the Board approve the 2016 Plan as a revision to the California SIP.