AIR QUALITY

3.9 Master Response on Salton Sea Air Quality Monitoring and Mitigation Plan

3.9.1 Introduction

Commenters have requested additional discussion of measures that might be practical, available, and feasible for problem assessment and avoiding, minimizing, and mitigating potential dust and air quality impacts associated with exposed shoreline around the Salton Sea caused by the Project. This master response is intended to address those comments.

3.9.2 Difficulties Associated with Impact Assessment

Comments on the Air Quality Section of the Draft Environmental Impact Report/ Environmental Impact Statement (EIR/EIS) vary widely but tend to acknowledge that prediction of the scale or intensity of future dust impacts is not possible, given the limited available information on submerged areas and the variability of conditions that might promote or inhibit dust emissions at the Salton Sea. Notes from the Salton Sea Authority on the Salton Sea Air Quality Workshop held April 3, 2002, concluded, "At this time there is neither enough data nor enough exposed shoreline to predict with any credibility where, when, or how bad the emissions will be." As stated in the Draft EIR/EIS, several factors prevent any reasonable quantitative estimate of emissions and associated impacts from the exposed shoreline:

- Lack of data regarding sediment characteristics.
- Lack of data relating sediment characteristics to surface stability and actual emissions rates.
- Spatial variations in sediment characteristics and land surface erodibility.
- Temporal variations in wind conditions.
- Temporal variations in factors contributing to the formation of salt crusts and otherwise influencing the tendency of land surfaces to emit dust in high winds.

It is also not possible to perform modeling of potential impacts on ambient concentrations of PM10 (particulate matter with a diameter of less than 10 micrometers) in areas around the Sea without information on mass emission rates, location, or the areal extent of emissive land surfaces.

3.9.3 Similarities to and Differences from Owens Lake

Several comments pointed to similarities between exposure of sediments at Salton Sea and at Owens Lake, suggesting that similar dust emissions and air quality problems could ensue with lowering of the Salton Sea elevation. This response is based on available information and considerable experience at Owens Lake (where a large dust mitigation program is being implemented by the Los Angeles Department of Water and Power) and at the Salton Sea (where Imperial Irrigation District [IID] has operated for many decades).

At the April 3, 2002 Air Quality Workshop held by the Salton Sea Authority, it was concluded that definitive data are lacking for prediction of PM10 emissions from exposed seabed sediments. However, several general observations regarding this comparison shed light on the level of risk of major dust emissions resulting from exposure of sediments at the Salton Sea.

Driving forces for dust emissions include wind and sand. Winds at the Salton Sea have been compared with those at Owens Lake in the Master Response on *Air Quality – Wind Conditions at the Salton Sea* in Section 3.16 of this Final EIR/EIS. Those data (Table 3.9-1) show that the frequency of high winds at the Salton Sea are much less frequent than at Owens Lake.

TABLE 3.9-1
Comparison of wind-speed frequency at 10 m above the ground surface for Salton Sea and Owens Lake

Site	>8.5 m/s (19 mph)	>11.0 m/s (25 mph)
Niland (near Salton Sea)	4.4%	1.4%
Tower N3 (Owens Lake)	18.9%	7.9%

Above a threshold wind velocity, sand if it is present on the surface, saltates (skips on the surface), and with each impact may break coherent soil crust and eject finer material upward into the airstream. So pronounced is the correlation of sand motion with PM10 emissions that, at Owens Lake, one of the primary tools for mapping dust emissions for mitigation is sand motion.

The sources of sand at Owens Lake are relatively steep-gradient streams feeding the lake, with few control structures to impede flow and cause sediment removal upstream of the lakebed. This has resulted in the following sand distribution at Owens Lake:

- A relatively continuous ring of sand dunes surrounding Owens Lake at its shoreline.
- Extensive areas of mobile sand (known locally as “sand sheets”) on the lakebed surface.
- Extensive areas of lakebed with deep sand deposits mapped as the dominant soil type.

In contrast, there is very little sand to blow in the southeastern shore areas of the Salton Sea, where bathymetry suggests that sediments would be most extensively exposed. This is because of shallow gradients and extensive control on tributary rivers. Likewise, sand sources such as dunes are absent in this area. Where sand dunes do occur along the western side of the Sea, bathymetry suggests sediment exposure would be very limited. Therefore, the co-occurrence of sand sources and exposed lakebed, which is so widespread and problematic at Owens Lake, appears to be largely absent in this area of the Salton Sea.

Exposed soil surfaces are more resistant to wind erosion when they are roughened or covered with a stable crust. When saline sediments are exposed by lowered water levels, the crust that forms at the soil surface is cemented by salt, and its strength is largely dependent on the strength of this cementation. The salt chemistry at Owens Lake results in a high proportion of sodium-carbonate evaporite salts that change radically in degree of hydration and volume at temperature variations within the range commonly experienced at Owens Lake. This has the effect of softening the crust and increasing rates of breakage and emissions. Comparing the makeup of salts in the Salton Sea (Bertram Station) and at Owens Lake (subsurface drainage or aerated groundwater), the following observations can be made (see Figure 3.9-1):

- There is much more (26 percent) calcium and magnesium at the Salton Sea; cations at Owens Lake contain 97 percent sodium.
- Carbonate and bicarbonate are virtually absent at the Salton Sea; they make up about 29 percent of anions at Owens Lake.
- Sulfate levels at Salton Sea (29 percent) are more than twice Owens Lake levels (12 percent).

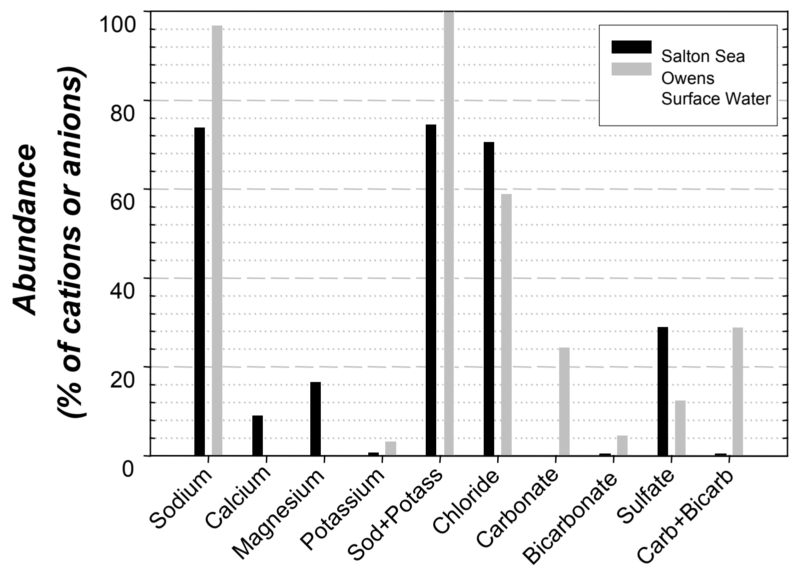

Figure 3.9-1

Relative abundance of major cations and anions at Salton Sea (Bertram Station, 1996-2001) and in subsurface drainage water at Owens Lake (Agrarian and Tree Rows sites, October 1998). Abundance for cations (sodium, calcium, magnesium, and potassium) is given as a percentage of the total cations, and for anions (chloride, carbonate, bicarbonate, and sulfate) as a percentage of total anions (milliequivalents/liter).

Further, the range of temperature variation at the Salton Sea is quite distinct from (generally warmer than) Owens Lake. The particular climatic interaction with salt minerals at Owens Lake influences dust emissions. This will also be the case at the Salton Sea. At the April 3 Air Quality Workshop, it was generally acknowledged that interactions between Salton Sea climate and minerals are undefined and constitute a pressing research need.

Sea levels have fluctuated over the period since the Sea filled during 1905 to 1907, resulting in periodic and extended exposure of significant Sea sediments. Such exposure at Owens and Mono Lakes generated unmistakable dust emissions. While there has been no systematic monitoring program at the Salton Sea, there does not appear to be any substantial anecdotal information that these areas have historically contributed observable dust emissions.

This is consistent with observations of soil crusts in the Salton Sea area. Crusts re-form when rain falls on these desert lakebeds and then progressively break apart over time; the extent and rate of breakage indicate the erosive forces to which the crusts are subjected, and, to some extent, the amount of wind erosion. Year-old crusts are generally heavily damaged in emissive areas at Owens Lake. Relatively old crusts (at least 18 months) generally show little damage at the Salton Sea.

In summary, weaker driving forces at Salton Sea, especially the absence of sand in potentially exposed areas, are consistent with observations suggesting that exposed sediments are not as emissive as they have been at Owens Lake.

3.9.4 Difficulties Associated with Specific Prescription of Mitigation

Without information on the nature and extent of the potential problem to be mitigated, it is unwise and impractical to propose or commit prematurely to costly dust control mitigation measures. Further, the dust control mitigation measures studied and under implementation at other lakebeds, such as Mono and Owens, may not be feasible or practical at the Salton Sea, given limitations on financial resources and the constraints on water availability for mitigation in this desert area. Nor would it be prudent to propose use of ratepayers' money to fund dust control measures for a problem that does not currently exist and may never materialize.

Under shoreline exposure scenarios, it is currently impossible to predict the extent and intensity of potential increases in dust emissions or the associated increases in ambient concentrations of the pollutant PM10 in excess of standards. The Draft EIR/EIS describes conditions at the Salton Sea that would naturally inhibit PM10 suspension, i.e., the combination of moisture present in the unsaturated zone beneath the exposed playa, the probable formation of dried algal mats and stable salt crusts consisting of chloride and sulfate salts, and the relatively low frequency of high wind events at the Salton Sea. In the best case, no problem would occur; in the worst case, a problem would emerge at some later date, after 2035, as the Sea's shoreline becomes exposed. Shoreline exposure caused by the Project will be delayed until that date because of implementation of the Salton Sea Habitat Conservation Strategy, which would provide mitigation water to the Sea to offset reductions in inflow caused by the Project. See the Master Response on *Biology—Approach to Salton Sea Habitat Conservation Strategy* in Section 3.5. IID would be responsible for impacts associated with implementation of the Proposed Project, apart from impacts associated with shoreline exposure anticipated from Baseline conditions.

3.9.5 Monitoring and Mitigation Plan

Rather than focusing on site-specific and costly dust control mitigation for an undefined and future potential problem, a phased approach is proposed to detect, locate, assess, and resolve this potentially significant impact. The following 4-step plan would be implemented to mitigate significant PM10 emissions and incremental health effects (if any) from Salton Sea sediments exposed by the Proposed Project:

(1) **Restrict Access.** Public access, especially off-highway vehicle access, would be limited, to the extent legally and practicably feasible, to minimize disturbance of natural crusts and soils surfaces in future exposed shoreline areas. Prevention of crust and soil disturbance is viewed as the most important and cost-effective measure available to avoid future dust impacts. IID or other governmental entities own or control most of the lands adjacent to and under the Salton Sea. Fencing and posting would be installed on these lands in areas adjacent to private lands or public areas to limit access.

(2) **Research and Monitoring.** A research and monitoring program would be implemented incrementally as the Sea recedes. The research phase would focus on development of information to help define the potential for problems to occur in the future as the Sea elevation is reduced slowly over time. Research would:

   (a) Study historical information on dust emissions from exposed shoreline areas.

   (b) Determine how much land would be exposed over time and who owns it.

   (c) Conduct sampling to determine the composition of "representative" shoreline sediments and the concentrations of ions and minerals in salt mixtures at the Sea. Review results from prior sampling efforts. Identify areas of future exposed shoreline with elevated concentrations of toxic substances relative to background.

   (d) Analyze to predict response of Salton Sea salt crusts and sediments to environmental conditions, such as rainfall, humidity, temperature, and wind.

   (e) Implement a meteorological, PM10, and toxic air contaminant monitoring program to begin under existing conditions and continue as the Proposed Project is implemented. Monitoring would take place both near the sources (exposed shoreline caused by the Project) and near the receptors (populated areas) in order to assess the source-receptor relationship. The goal of the monitoring program would be to observe PM10 problems or incremental increases in toxic air contaminant concentrations associated with the Proposed Project and to provide a basis for mitigation efforts.

   (f) If incremental increases in toxic air contaminants (such as arsenic or selenium, for example) are observed at the receptors and linked to emissions from exposed shoreline caused by the Project, conduct a health risk assessment to determine whether the increases exceed acceptable thresholds established by the governing air districts and represent a significant impact.

   (g) If potential PM10 or health effects problem areas are identified through research and monitoring and the conditions leading to PM10 emissions are defined, study potential dust control measures specific to the identified problems and the conditions at the Salton Sea.

(3) **Create or Purchase Offsetting Emission Reduction Credits.** This step would require negotiations with the local air pollution control districts to develop a long-term program for creating or purchasing offsetting PM10 emission reduction credits. Credits would be

used to offset emissions caused by the Proposed Project, as determined by monitoring (see measure 2, above). IID proposes negotiation of an offset program that would allow purchase of credits available under banking programs, such as Imperial County Air Pollution Control District Rule 214 for agricultural burning. Other means of dust control and PM10 emissions reductions available for application to agricultural operations in the IID service area would also be pursued for credit banking opportunities (e.g., managing vacant lands, improving farming practices to reduce PM10, and paving roads). This step would not be used to mitigate toxic air contaminants (if any); Step 4 would be necessary if toxic air contaminants pose a significant health issue.

(4) **Direct emission reductions at the Sea.** If sufficient offsetting emission reduction credits are not available or feasible, Step 4 of this mitigation plan would be implemented. It would include either, or a combination of:

(a) Implementing feasible dust mitigation measures. This includes the potential implementation of new (and as yet unknown or unproven) dust control technologies that may be developed at any time during the term of the Proposed Project; and/or

(b) If feasible, supplying water to the Sea to re-wet emissive areas exposed by the Proposed Project, based on the research and monitoring program (Step 2 of this plan). This approach could use and extend the duration of the Salton Sea Habitat Conservation Strategy.

If, at any time during the Project term, feasible dust mitigation measures are identified, these could be implemented in lieu of other dust mitigation measures or the provision of mitigation water to the Sea. Thus, it is anticipated that the method or combination of methods could change from time to time over the Project term.

The success of the proposed plan is dependent on coordination and cooperation of the involved parties and the air quality regulatory agencies. Coordination, communication, staff commitment, and funding will be required in each phase of the proposed research, monitoring, and emissions reduction program.

3.9.6 Impact Assessment; Feasibility of Implementation

The Draft EIR/EIS concludes that windblown dust from exposed shoreline caused by the Proposed Project may result in potentially significant and unavoidable air quality impacts that could not be mitigated. This conclusion was based upon (1) uncertainty regarding the actual air quality impacts of Salton Sea shoreline exposure, because of the lack of sufficient records or research regarding emissive potential, and (2) uncertainty regarding the availability or feasibility of mitigation measures. This conclusion was intended to be conservative in view of the broad disclosure goals of the California Environmental Quality Act and the National Environmental Policy Act.

This master response is intended to propose a method for identifying the scope of actual air quality impacts caused by the Project and for identifying and implementing potentially feasible mitigation measures that could reduce those impacts. The proposed mitigation is potentially sufficient to avoid or suppress PM10 emissions to less than significant levels. However, a level of uncertainty remains regarding whether short-term and long-term impacts can be mitigated to a less-than-significant level, as described below. Therefore, the conservative conclusion that these impacts are potentially significant and cannot be mitigated has been retained in this Final EIR/EIS.

With the implementation of Salton Sea Habitat Conservation Strategy, shoreline exposure caused by the Project would not begin until some time after the year 2035. Up to an estimated 16,000 acres of shoreline would potentially be exposed between 2035 and end of the Project term as a result of full implementation of the Proposed Project. The mitigation plan described above works in concert with the Salton Sea Habitat Conservation Strategy and is expected to reduce air quality impacts and PM10-related health effects. However, problem assessment and mitigation implementation would occur subsequent to the development of potential dust emissions. Therefore, interim impacts could be significant.

It is uncertain what the conditions in the Salton Sea Air Basin will be as of 2035 when Project impacts may begin to occur. The Imperial Valley portion of the Salton Sea Air Basin is currently a moderate nonattainment area and the Riverside County/Coachella Valley portion is currently a serious nonattainment area for the National Ambient Air Quality Standard for PM10. The attainment status of the Basin in 2035 cannot be ascertained; however, the Clean Air Act requires a plan for attainment well in advance of that date.

Cost and water availability may affect the feasibility of certain dust mitigation measures and the proposed delivery of water to the Sea to re-wet emissive areas, as proposed under the mitigation plan described above. If mitigation water is generated by non-rotational fallowing within the IID water service area, this may result in significant impacts to agriculture, as described in Section 3.5 of the Draft EIR/EIS. Fallowing may also adversely affect the Imperial Valley economy, as described in Section 3.14 of the Draft EIR/EIS. Before approving the Project, the Lead Agencies must balance the benefits and impacts of the Project as well as the effects and feasibility of proposed mitigation measures.

3.10 Master Response on Air Quality Issues Associated with Fallowing

3.10.1 Introduction

Several comments received on the Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) refer to the lack of pre- and post-mitigation emission estimates for fallowing of lands under the Proposed Project and Alternatives. The current analysis considers a worst case, in which a maximum of 84,800 acres per year would be fallowed, at unspecified locations, over an area of approximately 500,000 acres. The site-specific information required for estimation of emissions (soil type, soil moisture content, vegetative cover or residue, wind speed, wind travel distance or fetch) is not available because the fallowing program would be voluntary.

Commenters referred to potential emission factors for estimation of fallowing emissions, including the California Air Resources Board (ARB) document titled "Emission Inventory Procedural Manual, Volume III, Methods for Assessing Area Source Emissions in California" (California Air Resources Board 1997). This document has been reviewed and the author at ARB has been contacted (Gaffney 2002), confirming that emission factors for agricultural land fallowing are not currently available. The document includes some general emission factors for agricultural land preparation activities and windblown dust from agricultural land but nothing sufficient to quantify pre- and post-mitigation emissions from generic fallowed lands.

3.10.2 Fugitive Dust and PM10 Emissions from Fallowing

As described in the Draft EIR/EIS, in Mitigation Measure AQ-3, implementation of Best Management Practices (BMPs) to minimize PM10 emissions would be required for lands fallowed under the Proposed Project or Alternatives. These BMPs, which are listed on page 5.7-31 of the Draft EIR/EIS, include measures specified by the U.S. Department of Agriculture Natural Resources Conservation Service that are in common use in Imperial County to protect agricultural lands from wind erosion and mitigate fugitive dust emissions. Responsible land management and dust control may require use of more than one BMP for adequate mitigation, depending on field conditions, prior crop type, and potential dust emissions. Imperial Irrigation District (IID) would require conformance with these mitigation measures in the contracts between IID and the landowners who implement fallowing as part of the conservation program.

The land fallowing activities would occur in the IID water service area, which is under the jurisdiction of the Imperial County Air Pollution Control District (ICAPCD). ICAPCD Rule 800, Fugitive Dust Requirements for Control of Fine Particulate Matter (PM10), specifically exempts agricultural operations. As in most agricultural areas, soil conservation and fugitive dust control are accomplished by use of established and proven BMPs.

In the absence of available specific emission factors for fallowed lands, the approach taken in the Draft EIR/EIS is appropriate, and the conclusion that impacts would be less than significant with implementation of BMPs is also appropriate. It should be noted that emissions attributable to fallowing under the Project consist of any increment of additional emissions resulting from the conversion of a farmed field to a fallowed field. Several factors suggest that emissions from fallowed lands would likely be lower than the emissions from fields in agricultural production, and thus a net reduction in emissions would be anticipated if fallowing is implemented. These factors include the following:

(1) Seedbed preparation generates dust on cropped land.

(2) Other agricultural operations, such as cultivation and harvest, generate dust on cropped land.

(3) More vehicle and truck trips, often on unpaved roads, are involved in crop production than fallowing.

(4) Burning crop residue several times a year for multiple cropped fields generates dust.

Additionally, application of mitigation measures described in the Draft EIR/EIS and discussed above would further reduce emissions from fallowed fields. Dust and PM10 impacts from fallowing would therefore be reduced to less than significant.

3.10.3 Costs of Mitigation for Fallowed Fields

Costs of BMPs vary but are generally found practicable by agricultural land managers. Fallowing BMPs may be similar to those for a cropped field or may replace other BMPs practiced when land is in continuous crop production. The major cost issue is the loss of production from fallowed fields, because production normally offsets BMP costs. IID's program would involve contracts with the landowners participating in the fallowing program as part of the conservation and transfer project; those contracts would address the financial aspects of participation in the program, including any required mitigation.

3.10.4 Water Requirements and Impacts on the Transfer Project

BMPs vary with respect to water requirements. Methods such as leaving a field in a cloddy condition, which reduces emissions by roughening the land surface, and leaving crop residue (such as wheat stubble) from a previous crop, require no water. It is acknowledged that establishment of a new vegetative cover would require water. However, the cover crop would only need to be irrigated until adequate soil protection is established, and cover crops would require much less water than production crops. Once established, the cover crop could be effective for several seasons, so annual irrigation would not be required for maintenance. Delivery of water to meet these minimal requirements is facilitated by existing irrigation systems. Note that where fallow periods are sufficiently brief, crop residue and other measures may adequately protect soil, eliminating any irrigation requirement during the fallow. In calculating the amount conserved by fallowing a field, it is anticipated that IID's conservation program would take into account the water used for required mitigation for the fallowed field.

3.10.5 Adequacy of BMPs to Mitigate Impacts to Less than Significant

Soil conservation BMP development and specifications are based on a substantial body of land management research and practical experience. These BMPs are applied throughout U.S. agriculture, required as part of federal farmland conservation programs, and have been absorbed as a standard for soil conservation throughout much of the world. Adherence to these standard, proven practices assures that air quality will not be significantly degraded by an increase in emissions from agricultural lands.

3.10.6 Potential for Increased Pesticide and Herbicide Use to Control Weeds on Fallowed Lands

Weed growth will be discouraged without pesticides by the employment of vigorous and competitive cover crops when water is being applied and by the lack of water at other times. Normal cultural and chemical weed control will be used during the cropping phases of the rotation. Most chemical weed control on fallowed land is expected to take place during the cropping, not the fallow phases, of the rotation. Also note that chemical weed control is a significant land management cost that is accepted as a normal cost of agricultural production and offset in the producer's budget by income from the crop. When a field is fallowed, costly chemical weed control will be avoided simply because of its cost and the absence of offsetting revenue benefit.

3.10.7 Loss of Carbon Dioxide Sequestering Capacity if Fallowed Lands are Not Left With a Green Cover Crop

The capacity of soils to produce crops, sequester carbon, and provide other benefits is determined by their potential to store organic carbon and to support (living or dead) biomass. Standard soil conservation, practiced on cropped or fallow land, adequately protects this capacity.

3.11 Master Response on Emissions from Construction of Conservation Measures

3.11.1 Introduction

Many commenters suggested that potential dust emission from construction of conservation measures should be quantified.

3.11.2 Fugitive Dust (PM10) Emissions from Construction

Construction of on-farm and delivery-system conservation measures under the Proposed Project and Alternatives would take place in the Imperial Irrigation District (IID) water service area, which is under the jurisdiction of the Imperial County Air Pollution Control District (ICAPCD). For its construction activities, IID has and will continue to meet the requirements of ICAPCD Rule 800, Fugitive Dust Requirements for Control of Fine Particulate Matter (PM10). This includes requirements for mitigation of fugitive dust at all construction sites. If required by the ICAPCD, IID will submit and comply with site-specific dust control plans for construction projects associated with the water conservation and transfer program. For construction activities on area farms, IID would require conformance with these mitigation requirements in the contracts between IID and the landowners taking part in the conservation program.

Construction emission estimates prepared for this air quality analysis did not quantify fugitive dust emissions associated with soil disturbance for two reasons:

(1) Normal operations at farms involve a substantial amount of soil disturbance and installation of the conservation measures is assumed to be within the range of typical activities.

(2) The project- and site-specific information needed to do this quantification is not available because participation in the conservation program is voluntary in the case of the on-farm measures or as yet unplanned in the case of the system-based measures. The distribution and type of conservation measures that would be constructed, the amount of soil that would be disturbed, the schedule for construction, and the areas affected by the construction projects are not possible to predict and is expected to change over the 75-year Project term.

Although emissions cannot be quantified because of uncertainties regarding intensity and location of construction, BMPs to minimize PM10 emissions during construction, site restoration, and operation of the conservation measures are recommended as mitigation measures in the Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS). These Best Management Practices (BMPs) are in common practice in the IID water service area. They would include, but are not limited to the following:

- Equip diesel-powered construction equipment with particulate-matter emission-control systems, where required.
- Use paved roads to access the construction sites when possible.

- Minimize the amount of disturbed area, and apply water or soil-stabilization chemicals periodically to areas undergoing ground-disturbing activities. Limit vehicular access to disturbed areas, and minimize vehicle speeds.
- Reduce ground-disturbing activities as wind speeds increase. Suspend grading and excavation activities during windy periods (i.e., surface winds in excess of 20 miles per hour).
- Limit vehicle speeds on construction sites to 10 mph on unpaved roads.
- Cover trucks that haul soils or fine aggregate materials.
- Enclose, cover, or water excavated soil twice daily.
- Cover stockpiles of excavated soil at all times when the stockpile is not in use. Secure the covers.
- Replant vegetation in disturbed areas where water is available, following the completion of grading and/or construction activities.
- Designate personnel to monitor dust control measures to ensure effectiveness in minimizing fugitive dust emissions.

3.11.3 Exhaust Emissions from Construction Equipment

Commenters suggested that the construction equipment exhaust emissions for on-farm or water-delivery-system measures should be summed. Equipment exhaust emissions estimated for construction of the measures (Tables 3.7-12 and 3.7-13 of the Draft EIR/EIS) should not be summed, because the emissions estimates for each individual measure represent the maximum construction level (and associated emissions) anticipated for that measure for any given year over the life of the Proposed Project. This means that if more than one type of measure is constructed at the same time, each type would be constructed at less than 100 percent, so the combined emissions would never exceed the highest emissions estimated for any one type of measure. These estimates are provided to allow comparison of the measures available to meet the maximum estimated annual amount for conservation of 20 thousand acre-feet per year (KAFY).

Likewise, it is not appropriate to convert the annual estimates to daily emission rates. The significance criteria used in the Draft EIR/EIS are based on annual, rather than daily, emission rates. In addition, the location and timing of the proposed construction activities necessary to calculate a daily emission rate are unknown at this time.

ICAPCD does not have daily or annual significance thresholds for construction emissions. If required by ICAPCD, IID will submit site-specific construction emission estimates for its construction activities at the time specific projects are planned, including estimates of fugitive dust from soil disturbance, and evaluate these emissions in conjunction with other project-related emissions for level of significance and need for additional mitigation. The current analysis is for hypothetical conservation projects, and the project-specific information required for estimation of project-specific construction emissions or mitigation benefits is not available.

Several commenters expressed concern regarding emissions of ozone precursors (nitrogen oxides and volatile organic compounds) from construction equipment. As indicated in the Draft EIR/EIS, these emissions do not represent a significant impact, and mitigation is not required. However, for its construction activities, IID is committed to use of construction equipment that is maintained, properly tuned, and operated in a manner so as to reduce peak emission levels of ozone precursors. For construction activities on area farms, IID would require proper equipment maintenance and operation in the contracts between IID and the landowners taking part in the conservation program.

3.11.4 Emissions from Construction Employee Commute Vehicles

The analysis of construction impacts is for hypothetical conservation projects, and the project- and site-specific information required for estimation of emissions from construction employee commute vehicle travel (e.g., vehicle miles traveled, road conditions, project year) is not available. If required by ICAPCD, IID will submit site-specific employee commute vehicle exhaust emission estimates for its construction activities at the time specific projects are planned and will evaluate these emissions in conjunction with other project-related emissions for level of significance and need for mitigation. As stated in the Draft EIR/EIS, normal operations at farms involve employee and owner commute vehicle activities not substantially different than those proposed for the construction and operation of the conservation measures. As a result, construction of the conservation measures is not expected to substantially increase overall commute vehicle activities in the IID water service area. Any construction-related increases in emissions of exhaust from employee commute vehicles would be temporary and localized.

3.12 Master Response on Aggregate Emissions from the Salton Sea, Fallowing, and Construction

3.12.1 Introduction

Commenters requested additional evaluation of the air quality impacts associated with the aggregate emissions from the Proposed Project and Alternatives. Commenters emphasized ozone and PM10 (particulate matter with a diameter of less than 10 micrometers) because the locations of the Proposed Project and Alternatives in Imperial and Riverside Counties are designated as federal and state nonattainment areas for these two air pollutants. Commenters contended that the Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) inappropriately evaluated the Project's impacts on air quality by separately evaluating the emissions from different types of activities and not totaling the emissions.

This response discusses PM10 and ozone separately, to clarify both the types of emissions and timing of emissions from the various potential emissions sources associated with the Proposed Project and Alternatives. The emissions sources are construction emissions for conservation/transfer (both on-farm and water-delivery-system measures), construction emissions for the Habitat Conservation Plan (HCP) fallowing, and emissions from the exposed areas of the Salton Sea shoreline caused by the Proposed Project and Alternatives.

3.12.2 PM10 Emissions

It is acknowledged that increases in airborne dust would result in related increases in dust constituents such as PM10. As discussed in Section 3.10, Master Response on *Air Quality – Air Quality Issues Associated with Fallowing*, it is not possible to quantitatively estimate dust/PM10 emissions associated with fallowing. However, if fallowing is implemented as a method of generating conserved water, the Project effect is the conversion of a farmed field to a fallowed field, and several factors suggest that PM10 emissions from fallowed fields would be lower than emissions from fields in agricultural production. In addition, if Best Management Practices (BMPs) are implemented in connection with fallowing, as recommended in the Master Response on *Air Quality – Air Quality Issues Associated with Fallowing*, PM10 emissions from fallowing would be reduced to less than significant.

PM10 emissions from construction of on-farm measures to conserve the estimated maximum annual ramp-up amount of 20 thousand acre-feet per year (KAFY) of water were estimated in Table 3.7-12 of the Draft EIR/EIS at between 0.3 and 4.6 tons per year, depending on which on-farm measures were used. PM10 emissions for construction of water-delivery-system measures to conserve 20 KAFY annually were estimated in Table 3.7-13 of the Draft EIR/EIS and the accompanying text at 5.2 tons per year, at the highest. These emissions estimates cannot be added together for the purposes of assessing the impacts of construction measures for conservation because each reflects the conservation of the entire estimated maximum annual amount of 20 KAFY. As noted in the Draft EIR/EIS, there is no applicable significance criterion in the Imperial Valley (where all of the construction measures would take place); however, we applied the general conformity *de minimus* threshold of 100 tons per year for PM10. Construction of the on-farm measures, the water-delivery-system measures, or any mix of these measures for purposes of conserving the estimated maximum annual amount of 20 KAFY would result in PM10 emissions far below the PM10 significance threshold. As discussed in the Draft EIR/EIS, construction–related exhaust emissions of PM10 from employee commute vehicles would be within the context of normal farm and water system activities and would be minor, temporary, and localized. Operation and maintenance of the on-farm and/or water-delivery-system measures would be intermittent and within the range of normal activities for the area and would not result in any significant PM10 emissions.

Emissions associated with construction of marshes for the HCP are described in the Master Response on *Air Quality – Applicability of General Conformity Requirements to the Proposed Project or Alternatives* in Section 3.4. From this response, the PM10 emissions from construction equipment are estimated to not exceed 1 ton/year, and fugitive dust emissions would be negligible because the area where the HCP marshes would be constructed is very wet. No operations emissions of PM10 are expected.

With the implementation of the Salton Sea Habitat Conservation Strategy, Salton Sea shoreline exposure caused by the Proposed Project would not begin until some time after the year 2035. As discussed in detail in the Master Response on *Air Quality – Salton Sea Air Quality Monitoring and Mitigation Plan* in Section 3.9, no reasonable quantitative estimate of PM10 emissions from exposed shoreline can be made. However, the Monitoring and Mitigation Plan described in the Master Response is designed to mitigate PM10 emissions from the exposed seabed.

Table 3.12-1 shows the timing of the various PM10 emission sources in relation to each other.

TABLE 3.12-1
Timing of PM10 Emission Source

PM10 Source	Before 2035	After 2035
Salton Sea Exposed Shoreline	No	Yes
HCP Managed Marsh Construction	Yes	No
Fallowing	Yes	Yes
Construction for Conservation Measures	Yes	Yes

As discussed above, PM10 emissions associated with construction of conservation measures and marshes for the HCP are much lower than the *de minimus* threshold of 100 tons/year. PM10 emissions from fallowing with implementation of BMPs would be expected to be less than the emissions from fields in active agriculture. Before 2035, PM10 emissions impacts would therefore be less than significant.

After 2035, as Salton Sea shoreline begins to be exposed as a result of the Proposed Project, the Monitoring and Mitigation Plan would be implemented. The *Air Quality – Salton Sea Air Quality Monitoring and Mitigation Plan* states that the proposed mitigation is potentially sufficient to avoid or suppress PM10 emissions to less than significant levels. However, because of uncertainty in the magnitude of the emissions and the effectiveness of the mitigation, the conservative conclusion that PM10 impacts resulting from exposed Salton Sea shoreline are potentially significant and unmitigable has been retained in this Final EIR/EIS. Therefore, using the same rationale, the aggregate emissions of shoreline exposure, plus construction for conservation, plus fallowing would also be potentially significant and unmitigable. However, because the impacts from construction for conservation and fallowing are relatively small, the aggregate impacts including shoreline exposure are not expected to be substantially different from shoreline exposure alone.

3.12.3 Ozone

Ozone impacts associated with the Proposed Project would result from emissions of ozone precursors (reactive organic compounds [ROC] and nitrogen oxides [No_x]) by equipment used for construction of conservation measures and marshes for the HCP. No increase in ozone precursor emissions would be associated with fallowing or with the exposed Salton Sea shoreline.

Ozone precursor emissions for construction of on-farm measures to conserve the estimated maximum annual amount of 20 KAFY of water were estimated in Table 3.7-12 of the Draft EIR/EIS at between 1.1 and 9.7 tons per year of ROC and between 3.9 and 76.8 tons per year of NO_x, depending on which on-farm measures were used. Ozone precursor emissions for construction of water-delivery-system measures to conserve 20 KAFY annually were estimated in Table 3.7-13 of the Draft EIR/EIS and the accompanying text at 6.4 tons per year of ROC and 77.6 tons per year of NO_x, at the highest. These emissions estimates cannot be added together for the purposes of assessing the impacts of construction measures for conservation because each reflects the conservation of the entire estimated maximum annual ramp-up amount of 20 KAFY. As noted in the Draft EIR/EIS, there is no applicable significance criterion in the Imperial Valley (where all of the construction measures would take place); however, we applied the general conformity *de minimus* thresholds of 100 tons per year each of ROC and NO_x. Construction of the on-farm measures alone, the water-delivery-system measures alone, or any mix of these measures for purposes of conserving the estimated maximum annual amount of 20 KAFY would result in ozone precursor emissions no higher than the highest-emitting individual measure (9.7 tons per year ROC and 77.6 tons per year NO_x), which are below the significance thresholds for ROC and NO_x. As discussed in the Draft EIR/EIS, construction–related exhaust emissions from employee commute vehicles would be within the context of normal farm and water-system activities and would be temporary and localized. Operation and maintenance of the on-farm and/or water-delivery-system measures would be intermittent and within the range of normal activities for the area and would not result in any significant additional ozone precursor emissions.

3.13 Master Response on Health Effects Associated with Dust Emissions

3.13.1 Introduction

Commenters requested additional evaluation of the potential health effects associated with air quality impacts, in particular dust and PM10 emissions, from the Proposed Project and Alternatives.

It is acknowledged that increases in airborne dust would result in related increases in dust constituents such as PM10 (particulate matter with a diameter of less than 10 micrometers) and would also have the potential to increase associated health effects.

This master response discusses the potential for incremental health effects from PM10 exposure associated with the Proposed Project from two different perspectives. First, health effects are assessed that are related to the *size* of PM10 – that is, the ability of particles to penetrate the respiratory system and cause adverse health effects because of their small size. And second, health effects are assessed that are related to the *composition* of PM10 – that is, the possibility that compounds known to be toxic to humans or other living organisms could be present in the dust particles and could be absorbed into the body through inhalation, dermal contact, or ingestion.

3.13.2 Health Effects from PM10 Particle Size

According to the U.S. Environmental Protection Agency (US EPA), PM10-sized particles can originate from sources such as windblown dust and can accumulate in the respiratory system and aggravate respiratory conditions, including asthma. Children, the elderly, and persons with pre-existing cardiopulmonary disease are considered to be the most sensitive to PM10 exposure (US EPA 2002). Therefore, ambient air quality standards have been developed for PM10 by the US EPA. These standards are established to protect human health and welfare.

As mentioned in the Draft EIR/EIS, the US EPA recently promulgated new national ambient air quality standards for fine particles (PM2.5) because of their ability to deeply penetrate the respiratory system and cause acute health effects. The US EPA describes PM2.5 as originating from sources such as fuel combustion from motor vehicles, power generation, industrial facilities, and residential fireplaces and wood stoves (US EPA 1997). By contrast, coarse particles (PM10) are generally emitted from sources such as vehicles traveling on unpaved roads, materials handling, crushing and grinding operations, and windblown dust (US EPA 1997). Therefore, given the nature of the dust sources associated with the Proposed Project, PM2.5 is expected to make up only a relatively small fraction of the Project-generated particulate matter. As a result, the impacts described for PM10 in this Draft EIR/EIS would also apply for PM2.5 but to a much lesser extent.

The construction and fallowing associated with the Proposed Project and Alternatives would occur in the Imperial Irrigation District (IID) water service area, which is under the jurisdiction of the Imperial County Air Pollution Control District (ICAPCD). IID has and will continue to meet the requirements of ICAPCD Rule 800, Fugitive Dust Requirements for Control of Fine Particulate Matter (PM10). IID is committed to mitigation of dust impacts through implementation of Best Management Practices (BMPs) for fallowing and for construction of on-farm and system-based conservation measures. The EIR/EIS also prescribes a 4-Step monitoring and mitigation plan to minimize PM10 impacts associated with shoreline exposure (see the Master Response on *Air Quality – Salton Sea Air Monitoring and Mitigation Plan* in Section 3.9).

In addition, as noted in the Draft EIR/EIS, the ICAPCD has published a *State Implementation Plan for PM10 in the Imperial Valley* as a result of the area's designation as a federal moderate nonattainment area for PM10 (ICAPCD 1993). According to ICAPCD staff, this document is currently being updated. IID will coordinate with ICAPCD as it prepares the updated State Implementation Plan (SIP) to provide information on Project-related impacts and mitigation. The SIP will demonstrate ICAPCD's proposed control measures, methods, and schedule for attainment of the applicable ambient air quality standards for PM10.

The northern portion of the Salton Sea is within the South Coast Air Basin, and projects affecting that portion of the Sea would be subject to the SIP for this area (the Coachella Valley). With the implementation of the Salton Sea Habitat Conservation Strategy, shoreline at the Salton Sea would not begin to be exposed as a result of the Project until the year 2035. Consistency with the current SIP is not an issue, because no Project impacts are anticipated in this area for quite some time. The attainment status of the air basin in 2035 cannot be ascertained; however, if a SIP is required, IID will coordinate with South Coast Air Quality Management District to provide information on Project-related impacts and mitigation.

The combination of (a) BMPs for construction and fallowing, (b) dust mitigation for shoreline exposure, and (c) SIPs for region-wide emission reduction is potentially sufficient to avoid or suppress air quality impacts and PM10 emissions to less than significant levels. However, a level of uncertainty remains regarding whether air quality impacts associated with exposed shoreline can be mitigated to a less-than-significant level. Therefore, the conservative conclusion that air quality impacts, which include possible health effects as described above, are potentially significant and unmitigable has been retained in this Final EIR/EIS.

3.13.3 Health Effects from PM10 Particle Composition

Although the recommended mitigation would minimize Project-generated impacts on ambient PM10 levels, it is possible that newly exposed seabed could contain levels of toxic compounds that are higher than the natural background levels found in soils of the western U.S. These compounds would be present in windblown dust (or PM10) generated from the exposed seabed. Exposure could occur through inhalation, dermal contact, or ingestion. Health effects could occur if the Project creates an incremental increase in airborne toxic contaminants relative to Baseline conditions.

In 1999, Levine-Fricke conducted a comprehensive study to evaluate sediments underlying the Salton Sea, collecting sediment samples at 73 locations in the Salton Sea and its three main tributaries (Levine-Fricke 1999). The study found concentrations of the following substances in the seabed sediment at levels that exceeded maximum baseline concentrations for soils in the western United States:

- Cadmium
- Copper
- Molybdenum
- Nickel
- Zinc
- Selenium

A separate study by the U.S. Geological Survey and Bureau of Reclamation (Salton Sea Symposium III 2000) found that the highest selenium concentrations in sediment are in the deepest parts of the Sea, which would remain submerged under the Proposed Project.

The Levine-Fricke study also found that organic chemicals commonly used in agriculture in previous years were *not* detected at elevated concentrations in the sediment. These chemicals include DDT, many semivolatile organic compounds, chlorinated pesticides and PCBs, organophosphate and nitrogen pesticides, and chlorinated herbicides.

Another potential chemical of concern is arsenic because the background level of arsenic in some western U.S. soils already exceeds US EPA's Preliminary Remediation Goal (PRG) for arsenic in residential soil. (The PRGs combine current US EPA toxicity values with "standard" exposure factors to estimate contaminant concentrations in environmental media; these factors are considered protective of humans, including sensitive groups, over a lifetime). However, the Levine-Fricke study did not find elevated levels of arsenic in the Salton Sea sediment relative to the maximum baseline concentration for soils in the western U.S.

Other more limited studies have collected and analyzed Salton Sea sediment samples. These sampling efforts were mostly targeted at specific locations where localized problems were expected to exist. Specific examples include offshore of the U.S. Navy's Salton Sea Test Base, where non-explosive test ordnance has been dropped into the Sea, and the outlets of major tributaries such as the Alamo and New Rivers. At these locations, elevated concentrations of specific organic and inorganic constituents associated with specific activities or land uses in these areas have been found.

Under the Proposed Project, up to 16,000 acres of shoreline would be gradually exposed beginning in the year 2035. At this time, sufficient data do not exist to predict the amount of PM10 emissions from the exposed shoreline, nor do enough data exist to pinpoint the locations and extent of elevated metals concentrations in the exposed shoreline sediment. Therefore, a meaningful health risk assessment is not possible at this time. However, because the potential does exist for incremental health risks under the Proposed Project, the monitoring and mitigation plan for the Proposed Project includes the following steps to minimize the potential for health risks:

- Collect additional sediment samples
- Monitor emissions from exposed shoreline

- Monitor airborne concentrations
- Assess potential health risks if necessary
- Apply mitigation if necessary

These five steps are potentially sufficient to suppress the potential for Project-generated health effects from toxic compounds in PM10 to less-than-significant levels. However, a level of uncertainty remains regarding whether air quality impacts and related health effects associated with exposed shoreline can be mitigated to a less-than-significant level. Therefore, the conservative conclusion that air quality impacts, which include possible health effects as described above, are potentially significant and unmitigable has been retained in this Final EIR/EIS.

This sampling, monitoring, and mitigation plan is discussed in greater detail in the Master Response on *Air Quality – Salton Sea Air Quality Monitoring and Mitigation Plan* in Section 3.9 of this Final EIR/EIS. The results of the Levine-Fricke study are discussed in greater detail in the response to Comment F6-24 in Section 5 of this document.

3.14 Master Response on Applicability of General Conformity Requirements to the Proposed Project or Alternatives

3.14.1 Introduction

Several comments ask for clarification of the applicability of general conformity requirements to the Proposed Project and alternatives. In lieu of other quantitative air quality criteria (no air quality permit is required and Imperial County Air Pollution Control District does not have California Environmental Quality Act (CEQA) criteria or guidelines), general conformity *de minimis* levels were adopted by the lead agency as significance criteria to determine the potential for significance of project impacts in the Imperial Irrigation District (IID) water service area. However, as described below, the requirements of the General Conformity Rule were determined to be not applicable to the Proposed Project or alternatives, with one exception. The exception is the Habitat Conservation Plan (HCP), which involves the federal action of issuance of a permit by the U.S. Fish and Wildlife Service.

3.14.2 General Conformity Applicability Determination

The Clean Air Act at 42 USC 7506(c) prohibits federal agencies from approving or supporting any activity that does not conform to the applicable State Implementation Plan for attainment of national ambient air quality standards. This provision is implemented through regulations promulgated by U.S. Environmental Protection Agency, which are found at 40 CFR 51.850 et seq., also known as the General Conformity Rule.

The following discussion documents the finding that the requirements of the General Conformity Rule do not apply to the remainder of the Proposed Project or Alternatives (other than the HCP).

40 CFR 51.853(b) provides: "A conformity determination is required for each pollutant where the total of direct and indirect emissions in a nonattainment or maintenance area caused by a Federal action would equal or exceed any of the rates" provided in a chart in that subparagraph. The emission thresholds that trigger requirements of the conformity rule for federal actions emitting nonattainment or maintenance pollutants, or their precursors, are called *de minimis* levels. For example, the *de minimis* threshold for PM10 (particulate matter with a diameter of less than 10 micrometers) in a serious nonattainment area is 70 tons per year, and in a moderate nonattainment area is 100 tons per year.

"Direct Emissions means those emissions of a criteria pollutant or its precursors that are caused or initiated by the Federal action and occur at the same time and place as the action" (40 CFR 51.852).

"Indirect Emissions means those emissions of a criteria pollutant or its precursors that: (1) are caused by the Federal action, but may occur later in time and/or may be further removed in distance from the action itself but are still reasonably foreseeable; and (2) the Federal agency can practicably control and will maintain control over due to a continuing program responsibility of the Federal agency" (40 CFR 51.582).

On the basis of these definitions, the General Conformity Rule is not applicable to the Proposed Project or Alternatives, with the exception of the HCP, and a conformity determination is not required. IID, not a federal agency, is the responsible agency for selection of the conservation measures to support the Project. As a result:

- No federal agency action causes or initiates the direct or indirect emissions from the Proposed Project or Alternatives.
- No federal agency can practicably control the Project emissions.
- No federal agency will maintain control over the Project emissions because of a continuing responsibility of the agency.

3.14.3 Applicability of General Conformity Requirements to the HCP

The HCP will involve the federal action of issuance of a permit by the U.S. Fish and Wildlife Service, and as a result is subject to General Conformity requirements. The General Conformity Rule requires quantification of construction and operation emissions for the federal action, comparison of these emission levels to baseline emission levels, and if the difference exceeds the General Conformity *de minimis* levels for the peak year or any milestone year for attainment of standards, additional General Conformity determination is required.

To estimate emissions for construction of the HCP, lists of the types of equipment required and estimates of the length of time the equipment would need to operate were developed based on experience with construction of similar facilities at other locations. Emission factors from the South Coast Air Quality Management District (SCAQMD) CEQA *Air Quality Handbook* were used to estimate exhaust emissions associated with operation of the construction equipment (SCAQMD 1993).

Creation of the managed marsh habitat will be phased over 15 years, with at least one-third of the total amount created within 5 years, two-thirds within 10 years, and the total amount created within 15 years. One pond per year will be constructed with pond size between 40 acres and 160 acres. For construction of a 160-acre pond with a 2-foot high berm, emission estimates do not exceed 1 ton/pond, or 1 ton/year, for any nonattainment criteria pollutant or precursor, assuming a 2- to 4-week construction period. Negligible fugitive dust emissions are expected, as the soils in the area where the ponds will be constructed are very wet. No operation emissions are anticipated. Baseline emissions would be zero, so the emissions estimated for construction and operation of the HCP (the federal action) were directly compared to *de minimis* levels.

Emissions associated with the federal action are far below General Conformity *de minimis* levels, and are not regionally significant (that is, they do not represent 10 percent of the area emission inventory). On this basis, the federal action associated with the HCP is presumed to conform, and no further conformity determination is required.

3.15 Master Response on Consistency with the State Implementation Plan for PM10

Commenters requested additional discussion of the consistency of the Proposed Project and alternatives with the applicable State Implementation Plans (SIPs) for PM10 (particulate matter with a diameter of less than 10 micrometers).

The construction and fallowing associated with the Proposed Project and Alternatives would occur in the Imperial Irrigation District (IID) water service area, which is under the jurisdiction of the Imperial County Air Pollution Control District (ICAPCD). As noted in the Draft Environmental Impact Report/Environmental Impact Statement, as a result of the area's designation as a federal moderate nonattainment area for PM10, the ICAPCD has published a *State Implementation Plan for PM10 in the Imperial Valley* (ICAPCD 1993). According to ICAPCD staff, this document is currently being updated (Romero 2001). IID will coordinate with ICAPCD as it prepares the updated SIP and the related ICAPCD Rules and Regulations, to provide information on Project-related impacts and mitigation. The SIP will demonstrate ICAPCD's proposed control measures, methods, and schedule for attainment of the applicable ambient air quality standards, and the ICAPCD Rules and Regulations will be revised to implement the required control measures. IID will comply with applicable requirements.

The northern portion of the Salton Sea is in the South Coast Air Basin and projects affecting this portion of the Sea would be subject to the SIP for this area (the Coachella Valley). With the implementation of the Salton Sea Habitat Conservation Strategy, shoreline at the Salton Sea would not begin to be exposed until some time after the year 2035. Consistency with the current SIP is not an issue, as no Project impacts are anticipated in this area until the shoreline recedes. The attainment status of the air basin in 2035 cannot be ascertained; however, if a SIP is required, IID will coordinate with South Coast Air Quality Management District to provide information on project-related impacts and mitigation. Again, IID will comply with applicable requirements.

3.16 Master Response on Wind Conditions at the Salton Sea

3.16.1 Introduction

The Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) describes the wind patterns representative of the Salton Sea on pages 3.7-14-15. Wind roses are presented for two representative meteorological stations—California Irrigation Management Information System (CIMIS) Station 154 (located near the city of North Shore, on the northeast side of the Sea in Riverside County) and CIMIS Station 127 (in Salton City, near the middle portion of the western shoreline of the Salton Sea in Imperial County). The wind data are then used later in the Draft EIR/EIS to help assess the potential air quality impacts associated with the proposed project.

Several comments were received regarding the wind data in the Draft EIR/EIS; they are summarized as follows:

- Site descriptions of the meteorological stations should be incorporated into the document.
- The frequency of high wind speeds capable of generating dust emissions seems too low.
- The different anemometer heights of the meteorological stations make comparisons invalid.
- Niland is the most representative meteorological site for the area of concern.
- Wind gusts should be considered when predicting the potential for windblown dust.
- Wind speeds as low as 17 mph would potentially cause windblown dust, based on research at Owens Lake.

3.16.2 Discussion

The Salton Sea wind data are used for two primary purposes in the Draft EIR/EIS: first, to help determine whether the winds are strong enough to generate windblown dust emissions under the Proposed Project; and second, to help gain a perspective on the potential severity of windblown dust impacts. Based on this wind data, the Draft EIR/EIS concludes that (1) wind speeds occasionally reach levels that could generate windblown dust, thereby supporting our finding of a significant impact; and (2) high wind speeds occur much more frequently at Owens Lake than at the Salton Sea, thereby supporting our statement that the potential for frequent or severe dust events is much greater at Owens Lake than at the Salton Sea.

As pointed out in the comments, there are errors in the wind data presented in the Draft EIR/EIS. However, the two primary conclusions of the Draft EIR/EIS that are based on the wind data (which are summarized in the preceding paragraph) remain unchanged. These conclusions along with the corrected wind data are presented in the following discussion. The discussion focuses on responding to comments that would have a direct effect on the conclusions of the Draft EIR/EIS.

Potential for Windblown Dust Generation

Impact AQ-7 on pages 3.7-34 through 3.7-36 of the Draft EIR/EIS discusses the potential for windblown dust from exposed shoreline at the Salton Sea. Under the Proposed Project, about 16,000 acres of currently submerged bottom sediments or playa would become exposed by the year 2077.

The wind data presented in the Draft EIR/EIS for Stations 154 and 127 are incorrect. Therefore, additional meteorological data from Niland, California (east of the Salton Sea in Imperial County) were obtained from the Imperial County Air Pollution Control District (ICAPCD) for the years 2000 and 2001 (ICAPCD, 2002). As suggested by a commenter, Niland data are considered representative of the winds that could generate dust on the exposed shoreline of the Salton Sea.

Figures 3.16-1 and 3.16-2 on the following pages present annual wind roses for Niland for the years 2000 and 2001, respectively, at an anemometer height of 10 meters above ground. Tables 3.16-1 and 3.16-2 present the corresponding wind frequency tables for Niland. Although the meteorological data used to compile these figures and tables are missing a significant number of observations (26 percent missing in 2000 and 11 percent missing in 2001), they nevertheless give a good approximation of wind conditions at the Salton Sea.

Table 3.16-a summarizes high wind frequency data for the Salton Sea and Owens Lake. The wind frequency tables for Niland show that the average hourly wind speed exceeded 8.5 m/s (19 mph) about 4.4 percent of the time in 2000 and 3.2 percent of the time in 2001. The wind speed exceeded 11.0 m/s (25 mph) about 1.4 percent of the time in 2000 and 0.7 percent of the time in 2001. Although the precise wind speed needed to generate windblown dust at the Salton Sea is not known, research from Owens Lake suggests that wind speeds exceeding 17 mph may be sufficient to generate dust. Using this speed as a guide indicates that the potential does exist for windblown dust generation on the Salton Sea shoreline. Wind gusts could further increase the potential for short term bursts of dust emissions even when the average wind speeds are lower.

TABLE 3.16-a
Comparison of wind speed frequency at 10 m above the ground surface for Salton Sea and Owens Lake, Year 2000

Site	>8.5 m/s (19 mph) percentage	>11.0 m/s (25 mph) percentage
Niland (near Salton Sea)	4.4	1.4
Tower N3 (Owens Lake)	18.9	7.9

Severity of Dust Impacts

To gain a perspective on the potential severity of the impact of windblown dust, the Draft EIR/EIS compares conditions at Owens Lake, where extreme dust events have occurred, to conditions at the Salton Sea. The Draft EIR/EIS concludes that the potential for frequent or severe dust events is much greater at Owens Lake than at the Salton Sea, in part because of differences in wind conditions between the two areas.

Figure 3.16-3, and corresponding Table 3.16-3, show wind data from Owens Lake for the year 2000 (CH2M HILL, 2000a, 2000b, 2000c, and 2001). The data were measured from Tower N3, which was located in the southern portion of the dry lakebed in an area of frequent large dust storms. The anemometer height was 10 meters, equal to that at the Niland station.

The wind frequency table for Owens Lake shows that the average hourly wind speed exceeded 8.5 m/s (19 mph) about 18.9 percent of the time in 2000 (Table 3.16-a). The wind speed exceeded 11.0 m/s (25 mph) about 7.9 percent of the time in 2000. A comparison of these results for the Owens Lake station to those for the Niland station show that the Owens Lake station has a substantially greater frequency of higher wind speeds. Therefore, based on these data, the wind conditions at Owens Lake provide a much greater potential for frequent or severe dust events than at the Salton Sea.

Insert Figure 3.16-1. Wind Rose for Niland, California – Year 2000

Table 3-16.1. Wind Frequency Distribution for Niland, California – Year 2000

Station ID: 99999 RUN ID: Niland, Year 2000
Year: 2000
Date Range: Jan 1 - Dec 31
Time Range: Midnight - 11 PM
Anemometer Height: 10 meters

Frequency Distribution
(Normalized)

Speed (M / s)

Dir. (Deg)	0.50 - 2.00	2.00 - 3.50	3.50 - 5.50	5.50 - 8.50	8.50 - 11.00	> 11.00	Total
0.0	0.008025	0.006327	0.004784	0.002932	0.000309	0.000926	0.023302
22.5	0.006327	0.006173	0.001389	0.001698	0.000000	0.000000	0.015586
45.0	0.009877	0.011574	0.002778	0.000463	0.000000	0.000000	0.024691
67.5	0.010340	0.013272	0.003086	0.000154	0.000000	0.000000	0.026852
90.0	0.015278	0.031636	0.010957	0.000154	0.000000	0.000000	0.058025
112.5	0.018364	0.064660	0.045833	0.002006	0.000154	0.000000	0.131019
135.0	0.022994	0.056327	0.050000	0.009568	0.001080	0.000309	0.140278
157.5	0.023765	0.050463	0.029938	0.003858	0.000154	0.000000	0.108179
180.0	0.019599	0.036883	0.008488	0.000617	0.000000	0.000000	0.065586
202.5	0.012037	0.017747	0.003549	0.000463	0.000000	0.000000	0.033796
225.0	0.016975	0.012346	0.002623	0.002778	0.000772	0.000000	0.035494
247.5	0.012346	0.031173	0.016667	0.016358	0.006790	0.002315	0.085648
270.0	0.007870	0.031481	0.037963	0.036883	0.017593	0.010648	0.142438
292.5	0.007716	0.020525	0.015741	0.006944	0.001080	0.000000	0.052006
315.0	0.007253	0.016975	0.006019	0.001389	0.000154	0.000000	0.031790
337.5	0.008642	0.004475	0.002623	0.003241	0.001698	0.000309	0.020988
ALL	0.207407	0.412037	0.242438	0.089506	0.029784	0.014506	

Frequency Calm Winds : 0.43%
Average Wind Speed : 3.36 m/s
No. of Observations : 6,480 hours (74%)
Source Imperial County APCD, 2002.

Insert Figure 3.16-2. Wind Rose for Niland, California – Year 2001

Table 3.16-2. Wind Frequency Distribution for Niland, California – Year 2001

Station ID: 99999 RUN ID: Niland, Year 2001
Year: 2001
Date Range: Jan 1 - Dec 31
Time Range: Midnight - 11 PM
Anemometer Height: 10 meters

Frequency Distribution
(Normalized)

Speed (M / s)

Dir. (Deg)	0.50 - 2.00	2.00 - 3.50	3.50 - 5.50	5.50 - 8.50	8.50 - 11.00	> 11.00	Total
0.0	0.007692	0.006410	0.002564	0.002308	0.000897	0.000000	0.019872
22.5	0.007179	0.008205	0.001538	0.000769	0.000128	0.000000	0.017821
45.0	0.011410	0.016538	0.000385	0.000256	0.000000	0.000000	0.028590
67.5	0.012692	0.023205	0.001667	0.000128	0.000000	0.000000	0.037692
90.0	0.020897	0.054231	0.010128	0.000385	0.000000	0.000000	0.085641
112.5	0.024872	0.076538	0.047949	0.002564	0.000000	0.000128	0.152051
135.0	0.034487	0.089615	0.034872	0.006410	0.000769	0.000128	0.166282
157.5	0.021795	0.044103	0.019487	0.002821	0.000513	0.000000	0.088718
180.0	0.013846	0.018718	0.004359	0.000769	0.000000	0.000000	0.037692
202.5	0.011410	0.012179	0.003846	0.000641	0.000000	0.000000	0.028077
225.0	0.010897	0.012821	0.004744	0.001667	0.000000	0.000385	0.030513
247.5	0.011026	0.023590	0.015000	0.016667	0.012692	0.003077	0.082051
270.0	0.014359	0.041410	0.035385	0.026026	0.009615	0.002949	0.129744
292.5	0.010000	0.019231	0.011026	0.002308	0.000000	0.000000	0.042564
315.0	0.009487	0.013590	0.004231	0.000769	0.000000	0.000000	0.028077
337.5	0.007821	0.007308	0.002949	0.002949	0.000385	0.000000	0.021410
ALL	0.229872	0.467692	0.200128	0.067436	0.025000	0.006667	

Frequency Calm Winds : 0.32%
Average Wind Speed : 3.05 m/s
No. of Observations : 7,800 hours (89%)
Source Imperial County APCD, 2002.

Insert Figure 3.16-3. Wind Rose for Owens Lake, California – Year 2000

Table 3-16.3. Wind Frequency Distribution for Owens Lake, California – Year 2000

Station ID: 99999 RUN ID: Owens Lake, Year 2000
Year: 2000
Date Range: Jan 1 - Dec 31
Time Range: Midnight - 11 PM
Anemometer Height: 10 meters

Frequency Distribution
(Normalized)

Speed (M / s)

Dir. (Deg)	**0.50 - 2.00**	**2.00 - 3.50**	**3.50 - 5.50**	**5.50 - 8.50**	**8.50 - 11.00**	**> 11.00**	**Total**
0.0	0.025588	0.018554	0.006670	0.008732	0.012491	0.017948	0.089983
22.5	0.025346	0.015401	0.005457	0.006912	0.008368	0.004730	0.066214
45.0	0.023041	0.015401	0.006549	0.003153	0.001455	0.000364	0.049964
67.5	0.018676	0.012248	0.007155	0.001091	0.000000	0.000000	0.039171
90.0	0.012976	0.008368	0.002547	0.000121	0.000000	0.000000	0.024012
112.5	0.012006	0.006427	0.001213	0.000364	0.000243	0.000000	0.020252
135.0	0.014310	0.007155	0.003517	0.001577	0.000121	0.000121	0.026801
157.5	0.013461	0.012127	0.009823	0.018554	0.014310	0.014795	0.083071
180.0	0.025467	0.028256	0.032622	0.053844	0.040262	0.027286	0.207737
202.5	0.030075	0.040990	0.031530	0.039049	0.018191	0.004608	0.164443
225.0	0.021707	0.022920	0.013461	0.009459	0.004366	0.001213	0.073126
247.5	0.012491	0.011399	0.003032	0.005093	0.004851	0.001334	0.038200
270.0	0.009580	0.006912	0.002183	0.002425	0.001334	0.000121	0.022556
292.5	0.010308	0.003881	0.001577	0.000970	0.000364	0.000243	0.017342
315.0	0.012370	0.008853	0.002668	0.000728	0.000243	0.000121	0.024982
337.5	0.018554	0.012855	0.007034	0.003759	0.002668	0.006427	0.051298
ALL	0.285957	0.231749	0.137036	0.155833	0.109265	0.079311	

Frequency Calm Winds : 0.08%
Average Wind Speed : 4.82 m/s
No. of Observations : 8,239 hours (94%)
Source: CH2M HILL, 2000a, 2000b, 2000c, 2001.