4.1 Air Quality

4.1.1 Introduction

This air quality analysis examines potential air quality emissions that could result from construction associated with the proposed Project. The proposed Project would not cause any long-term changes to operations; departures and arrivals runway utilization, as well as arrival and departure thresholds, on Runway 24R would remain the same as existing conditions. The proposed Project would include implementation of declared distances on Runway 6L, which would shorten the available distance for aircraft landing on Runway 6L by 359 feet. This would have no significant impact on air quality associated with operations on this runway because arrivals on Runway 6L represent less than 1 percent of the total arrivals at LAX on an annual basis and the shortening of landing distance available would result in aircraft exiting the runway sooner (before reaching the end of the runway). Similarly, the proposed Project also includes the implementation of declared distances for Runway 6R-24L, which would reduce the Runway 6R ASDA and LDA by 115 feet. This would have no significant impact on operations on this runway because Runway 6R-24L is primarily used for departures on the north side of the airport (less than 2 percent of total arrivals at LAX on an annual basis occur on Runway 6R) and the shortening of landing distance available would result in aircraft exiting the runway sooner (before reaching the end of the runway). Therefore, no significant change in air quality as a result of operations is anticipated to occur under the proposed Project, and thus, is not further analyzed in this EIR.

Greenhouse gas emissions are discussed separately in Section 4.3, *Greenhouse Gas Emissions*, of this EIR. Potential impacts related to human health risks from inhalation of toxic air contaminant emissions are addressed in Section 4.4, *Human Health Risk Assessment*, of this EIR.

The air quality impact analysis presented below includes development of emission inventories for the proposed Project (i.e., the quantities of specific pollutants, typically expressed in pounds per day or tons per year) based on emissions modeling. The analysis also includes an assessment of localized concentrations for the proposed Project (i.e., the concentrations of specific pollutants within ambient air, typically expressed in terms of micrograms per cubic meter) based on screening criteria and dispersion modeling. The criteria pollutant emissions inventories and localized concentrations were developed using standard industry software/models and federal, state, and locally approved methodologies. Results of the emission inventories were compared to daily emissions thresholds established by the South Coast Air Quality Management District (SCAQMD) for the South Coast Air Basin (Basin).[1] This section is based in part on the detailed information contained in **Appendix B**, *Air Quality and Greenhouse Gas Emissions,* of this EIR.

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[1] South Coast Air Quality Management District, CEQA Air Quality Handbook, 1993; as updated by SCAQMD Air Quality Significance Thresholds, March 2011, Available: http://www.aqmd.gov/CEQA/handbook/signthres.pdf.

4.1.1.1 Pollutants of Interest

Six criteria pollutants were evaluated for the proposed Project: ozone (O_3) using as surrogates volatile organic compounds (VOCs)[2] and oxides of nitrogen (NO_X), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), respirable particulate matter or particulate matter with an aerodynamic diameter less than or equal to 10 micrometers (PM_{10}), and fine particulate matter or particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers ($PM_{2.5}$). These pollutants were analyzed because they were shown to have potentially significant impacts in the air quality analysis documented in Chapter 4.6, *Air Quality*, of the Los Angeles International Airport (LAX) Master Plan Final EIR.[3] In addition, these six criteria pollutants are considered to be pollutants of concern based on the type of emission sources associated with construction of the proposed Project, and are thus included in this assessment.

Although lead (Pb) is a criteria pollutant, it was not evaluated in this EIR because the proposed Project would have negligible impacts on Pb levels in the Basin. The only source of lead emissions from LAX is from aviation gasoline (AvGas) associated with piston-engine general aviation aircraft; however, due to the low number of piston-engine general aviation aircraft operations at LAX, AvGas quantities are low and emissions from these sources would not be affected by the proposed Project. Sulfate compounds (e.g., ammonium sulfate) are generally not emitted directly into the air but are formed through various chemical reactions in the atmosphere; thus, sulfate is considered a secondary pollutant. All sulfur emitted by airport-related sources included in this analysis was assumed to be released and to remain in the atmosphere as SO_2. Therefore, no sulfate inventories or concentrations were estimated.

Following standard industry practice, the evaluation of O_3 was conducted by evaluating emissions of VOCs and NO_X, which are precursors in the formation of O_3. Ozone (O_3) is a regional pollutant and ambient concentrations can only be predicted using regional photochemical models that account for all sources of precursors, which is beyond the scope of this analysis. Therefore, no photochemical O_3 modeling was conducted. Additional information regarding the six criteria pollutants that were evaluated in the air quality analysis is presented below.

<u>Ozone (O_3)</u>

O_3, a component of smog, is formed in the atmosphere rather than being directly emitted from pollutant sources. O_3 forms as a result of VOCs and NO_X reacting in the presence of sunlight in the atmosphere. O_3 levels are highest in warm-weather months. VOCs and NO_X are termed "O_3 precursors" and their emissions are regulated in order to control the creation of O_3.

O_3 damages lung tissue and reduces lung function. Scientific evidence indicates that ambient levels of O_3 not only affect people with impaired respiratory systems (e.g., asthmatics), but also healthy children and adults. O_3 can cause health effects such as chest discomfort, coughing, nausea, respiratory tract and eye irritation, and decreased pulmonary functions.

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[2] The emissions of volatile organic compounds (VOC) and reactive organic gases (ROG) are essentially the same for the combustion emission sources that are considered in this EIR. This EIR will typically refer to organic emissions as VOC.

[3] City of Los Angeles, <u>Final Environmental Impact Report for Los Angeles International Airport (LAX) Proposed Master Plan Improvements</u>, April 2004..

Nitrogen Dioxide (NO_2)

NO_2 is a reddish-brown to dark brown gas with an irritating odor. NO_2 forms when nitric oxide reacts with atmospheric oxygen. Most sources of NO_2 are man-made; the primary source of NO_2 is high-temperature combustion. Significant sources of NO_2 at airports are boilers, aircraft operations, and vehicle movements. NO_2 emissions from these sources are highest during high-temperature combustion, such as aircraft takeoff mode.

NO_2 may produce adverse health effects such as nose and throat irritation, coughing, choking, headaches, nausea, stomach or chest pains, and lung inflammation (e.g., bronchitis, pneumonia).

Carbon Monoxide (CO)

CO is an odorless, colorless gas that is toxic. It is formed by the incomplete combustion of fuels. The primary sources of this pollutant in Los Angeles County are automobiles and other mobile sources. The health effects associated with exposure to CO are related to its interaction with hemoglobin once it enters the bloodstream. At high concentrations, CO reduces the amount of oxygen in the blood, causing heart difficulties in people with chronic diseases, reduced lung capacity, and impaired mental abilities.

Particulate Matter (PM_{10}) and Fine Particulate Matter ($PM_{2.5}$)

Particulate matter consists of solid and liquid particles of dust, soot, aerosols, and other matter small enough to remain suspended in the air for a long period of time. PM_{10} refers to particulate matter with an aerodynamic diameter less than or equal to 10 micrometers (microns, um, or µm) and $PM_{2.5}$ refers to particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers. Particles smaller than 10 micrometers (i.e., PM_{10} and $PM_{2.5}$) represent that portion of particulate matter thought to represent the greatest hazard to public health.[4] PM_{10} and $PM_{2.5}$ can accumulate in the respiratory system and are associated with a variety of negative health effects. Exposure to particulate matter can aggravate existing respiratory conditions, increase respiratory symptoms and disease, decrease long-term lung function, and possibly cause premature death. The segments of the population that are most sensitive to the negative effects of particulate matter in the air are the elderly, individuals with cardiopulmonary disease, and children. Aside from adverse health effects, particulate matter in the air causes a reduction of visibility and damage to paints and building materials.

A portion of the particulate matter in the air comes from natural sources such as windblown dust and pollen. Man-made sources of particulate matter include fuel combustion, automobile exhaust, field burning, cooking, tobacco smoking, factories, and vehicle movement on, or other man-made disturbances of, unpaved areas. Secondary formation of particulate matter may occur in some cases where gases like sulfur oxides (SO_X)[5] and NO_X interact with other compounds in the air to form particulate matter. In the Basin, both VOCs and ammonia are also

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[4] U.S. Environmental Protection Agency, Particle Pollution and Your Health, September 2003.

[5] The term SO_X accounts for distinct but related compounds, primarily SO_2 and, to a far lesser degree, sulfur trioxide. As a conservative assumption for this analysis, it was assumed that all SO_X is emitted as SO_2, therefore SO_X and SO_2 are considered equivalent in this document and only the latter term is used henceforth.

considered precursors to $PM_{2.5}$. Fugitive dust generated by construction activities is a major source of suspended particulate matter.

The secondary creators of particulate matter, SO_X and NO_X, are also major precursors to acidic deposition (acid rain). While SO_X is a major precursor to particulate matter formation, NO_X has other environmental effects. NO_X reacts with ammonia, moisture, and other compounds to form nitric acid and related particles. Human health concerns include effects on breathing and the respiratory system, damage to lung tissue, and premature death. Small particles penetrate into sensitive parts of the lungs and can cause or worsen respiratory disease. NO_X has the potential to change the composition of some species of vegetation in wetland and terrestrial systems, to create the acidification of freshwater bodies, impair aquatic visibility, create eutrophication of estuarine and coastal waters, and increase the levels of toxins harmful to aquatic life.

Sulfur Dioxide (SO_2)

Sulfur oxides are formed when fuel containing sulfur (typically, coal and oil) is burned, and during other industrial processes. The term "sulfur oxides" accounts for distinct but related compounds, primarily SO_2 and sulfur trioxide. As a conservative assumption for this analysis, it was assumed that all SO_X are emitted as SO_2; therefore, SO_X and SO_2 are considered equivalent in this document. Higher SO_2 concentrations are usually found in the vicinity of large industrial facilities.

The physical effects of SO_2 include temporary breathing impairment, respiratory illness, and aggravation of existing cardiovascular disease. Children and the elderly are most susceptible to the negative effects of exposure to SO_2.

4.1.1.2 Scope of Analysis

The air quality analysis conducted for the proposed Project addresses construction-related emissions in 2015. The scope of the evaluation of construction emissions was conducted to:

- Identify construction-related emissions sources for the identified sources.
- Develop peak daily construction emissions inventories.
- Compare emissions inventories with appropriate California Environmental Quality Act (CEQA) thresholds for construction.
- Conduct dispersion modeling for Project construction emissions.
- Obtain background concentration data from SCAQMD and estimate future concentrations resulting from construction of the proposed Project.
- Identify potential construction-related mitigation measures if warranted beyond what is already required through LAX Master Plan commitments and mitigation measures.

4.1.2 Methodology

4.1.2.1 Emission Source Types

Construction Activities

Construction-related emissions were quantified for CO, VOC, NO_X, SO_2, PM_{10}, and $PM_{2.5}$ for the proposed Project's construction activities (Project components). Sources of construction emissions evaluated in the analysis include off-road and on-road construction equipment, as well as fugitive emissions of particulate matter (PM_{10} and $PM_{2.5}$) and VOCs.

The basis for the construction emissions analysis are construction schedules that were developed for each individual Project component that together constitute the proposed Project. Construction activity estimates were developed for each Project component, from which monthly emissions were quantified. Daily emissions were calculated by dividing monthly emissions by the number of work days in the given month, based on a 6-day-per-week workweek, from which maximum daily emissions were derived. Annual and quarterly emissions, as applicable, were based on the monthly emissions estimates.

Emissions estimates for the proposed Project's construction activities included the application of emission reduction measures required by the LAX Master Plan Mitigation Monitoring and Reporting Program (MMRP), the LAX Master Plan-Mitigation Plan for Air Quality (LAX MP-MPAQ) and SCAQMD rules, as well as additional control measures set forth in the LAX Master Plan Community Benefits Agreement. These measures are applicable in varying degrees to each criteria pollutant. The measures that would result in reductions of criteria pollutant emissions are discussed in Section 4.1.5 below.

As further described in Chapter 2, *Project Description*, construction of the proposed Project is expected to occur entirely in 2015.

Off-Road Equipment

Off-road construction equipment includes dozers, loaders, sweepers, and other heavy-duty construction equipment that are not licensed to travel on public roadways. Off-road construction equipment types, models, horsepower, load factor, and estimated daily hours of operation were provided for each individual Project component. Equipment types with corresponding operating hours were matched with specific construction activities for each Project component. Monthly hours of operation were based on 10 hours per day through the duration of each Project component.

Off-road diesel exhaust emission factors for VOC, NO_X, and PM_{10} were based on U.S. Environmental Protection Agency (USEPA) tiered emissions standards, consistent with recommended construction-related air quality control measures developed for LAX. Off-road exhaust emission factors for CO were derived from the California Air Resources Board's (CARB's) OFFROAD2007 Model. $PM_{2.5}$ emission factors were developed using the PM_{10}

emission factors and $PM_{2.5}$ size profiles derived from the CARB-approved California Emission Inventory and Reporting System (CEIDARS).[6]

Emissions for off-road equipment were calculated by multiplying an emission factor by the horsepower, load factor, usage factor, and operational hours for each type of equipment. Consistent with mitigation measure MM-AQ-2, certain equipment types were assumed to be equipped with diesel particulate filters (DPFs) achieving PM_{10} and $PM_{2.5}$ emissions reductions ranging from 8.3 to 74.7 percent. Diesel construction equipment meeting USEPA Tier 4 emissions standards were not assumed to be equipped with DPFs (because they must meet stringent emission requirements, DPFs are effectively built in to Tier 4 equipment).

On-Road On-Site Equipment

On-road on-site equipment emissions are generated from on-site pickup trucks, water trucks, haul trucks, dump trucks, cement trucks, and other on-road vehicles that are licensed to travel on public roadways. Exhaust emissions for each construction year from on-road, on-site vehicles were calculated using CARB's EMFAC2011 emission factor model.

On-road on-site equipment types were categorized into vehicle types corresponding to CARB vehicle classes. Emission factors from the EMFAC2011 model are expressed in grams per mile and account for startup, running, and idling operations. In addition, the VOC emission factors include diurnal, hot soak, running, and resting emissions, while the PM_{10} and $PM_{2.5}$ factors include tire and brake wear.

The emission factors were converted to pounds per hour and applied to the hourly activity schedule described previously. Heavy-duty diesel trucks were modeled to comply with USEPA 2007 on-road emissions standards and all diesel trucks were assumed to be fitted with exhaust retrofit devices providing an 85 percent reduction in PM_{10} and $PM_{2.5}$ emissions.

On-Road Off-Site Equipment

On-road off-site vehicle trips include personal vehicles used by construction workers to access the construction site, as well as hauling trips for the transport of various materials to and from the site. In general, off-site hauling trips were based on estimated quantities of various materials, such as concrete, construction materials, cut/fill material, etc. On-road off-site vehicle emissions were calculated by determining total vehicle miles traveled (VMT) by each type of vehicle. The emission factors obtained from EMFAC2011 as described previously (in grams per mile) were applied to the VMT estimates to calculate total emissions.

Fugitive Dust

Fugitive dust is an additional source of PM_{10} and $PM_{2.5}$ emissions associated with construction activities. Fugitive dust includes re-suspended road dust from both off- and on-road vehicles, as well as dust from grading, loading, and unloading activities. Additional sources of fugitive dust quantified in the analysis included construction demolition, crushing of demolished pavement, and concrete batching. Fugitive dust emissions were calculated using methodologies, formulas, and values from the USEPA's Compilation of Air Pollutant Factors (AP-42), the SCAQMD's

[6] South Coast Air Quality Management District, Final – Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, October 2006, Available at: www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html. Accessed February 27, 2013).

CEQA Air Quality Handbook, and documentation associated with CARB's CalEEMod emissions estimator computer program.

Watering, as required under LAWA construction contracts and also being one of the main dust suppression measures recognized in SCAQMD Rule 403, was assumed to reduce fugitive dust emissions by 61 percent.[7]

Fugitive VOCs

A primary source of construction-related fugitive VOC emissions is hot-mix asphalt paving. VOC emissions from asphalt paving operations result from evaporation of the petroleum distillate solvent, or diluent, used to liquefy asphalt cement. Based on the CARB default data contained within CalEEMod, an emission factor of 2.62 pounds of VOC (from asphalt curing) per acre of asphalt material was used to determine VOC emissions from asphalt paving.

Aircraft Operations during Construction

Runway 6L-24R would be closed for a period of 122 days (approximately 4 months) during the runway rehabilitation construction period; operations from this runway must be accommodated through the use of other runways at LAX during this time. In order to determine air quality impacts during this period, airport simulation models (SIMMOD) were developed for the 2015 Without Project scenario and the 2015 runway closure period. Information on the number and types of aircraft operations considered at LAX for 2015 were developed specifically for the Project. These data were used to develop SIMMOD of aircraft operations in order to determine Project-specific taxi/idle times. The SIMMOD used information about facilities and operations to predict specific timing, volume, and location (e.g., runway used) for aircraft operations. In addition, to allow for completion of construction work on a portion of the Argo Ditch, Runway 6L-24R must operate at a reduced length of 7,000 feet for a period of 60 days (2 months). Taxi times for this period were calculated using the increased taxiing distance and a taxiway speed of 15 knots. Detailed assumptions are included in Appendix B.

The incremental differences in taxi/idle times were used for the analysis of aircraft emissions associated with the shift in aircraft operations during the runway closure period and the shortened runway period; taxi/idle times during both of these periods will be slightly greater than normal operations during 2015. As no other phases of the landing-takeoff (LTO) cycle (approach, taxi/idle, takeoff, and climbout) would be affected by the proposed Project, only taxi/idle emissions were analyzed. A summary of the taxi times are shown in **Table 4.1-1**.

[7] South Coast Air Quality Management District, Rule 403, June 3 amended 2005, Available at: http://www.aqmd.gov/rules/reg/reg04/r403.pdf, Accessed January 1, 2014.

Table 4.1-1

LAX Total Aircraft Operations and Taxi Times, by Calendar Year

Year/Scenario	Days in 2015	Taxi-In Time (minutes per operation)	Taxi-Out Time (minutes per operation)
2015 Without Project	183	9.21	12.05
2015 Runway Closure Period	122	9.26	12.62
2015 Shortened Runway Period	60	9.39	12.05

Source: Ricondo & Associates, Inc., 2013.

Aircraft emissions were calculated using FAA's Emissions and Dispersion Modeling System (EDMS), Version 5.1.4.1.[8] EDMS is a USEPA approved air quality model that estimates emissions from airport sources based on information input into the model. Emissions produced by LAX activity during four aircraft operational modes (approach, taxi/idle, takeoff, and climbout) were calculated for each scenario. The taxi/idle times were derived from the SIMMOD results. The EDMS default times-in-mode were the basis for climbout, approach, and takeoff times; however, climbout and approach times were adjusted according to the average mixing height adjustment parameters contained in EDMS. For LAX, a mixing height of 1,806 feet above mean sea level was used in the emissions modeling.[9, 10, 11]

Annual emissions outputs from EDMS for the runway closure period, shortened runway period, and normal operations were annualized based on the number of days for each phase. The incremental change in emissions between the Without Project and the annualized emissions for the runway closure period and shortened runway period scenarios would be the Project's construction impact from aircraft.

4.1.2.2 Localized Concentration

The localized effects from the on-site portion of daily emissions from the sources described above were evaluated at nearby sensitive receptor locations potentially impacted by the proposed Project according to the SCAQMD's localized significance threshold (LST) methodology, which uses on-site mass emission rate look-up tables with Project-specific daily construction site areas (acres) and receptor distances. In accordance with SCAQMD practices,

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8 Federal Aviation Administration, Emissions and Dispersion Modeling System User's Manual with Supplements, EDMS Version 5.1.4.1, August 2013.

9 Mixing height is the vertical distance between the earth's surface and the height to which convection movements within the atmosphere extend, typically a few thousand feet. The height is often located at the interface of warm air situated on top of cooler air (thermal inversion). The thermal inversion suppresses turbulent mixing and thus limits the upward dispersion of polluted air.

10 Holzworth, George C., USEPA, Office of Air Programs, Mixing Heights, Wind Speeds and Potential for Urban Air Pollutant Throughout the Contiguous United States (AP-101), 1972.

11 Energy and Environmental Analysis, Inc., Technical Support Document: Civil and Military Aviation (California FIP NPRM), March 24, 1994.

LSTs are only applicable to on-site emissions of the following criteria pollutants: NO_X, CO, PM_{10}, and $PM_{2.5}$.

LSTs represent the maximum emissions from a project that are not expected to cause or contribute to an exceedance of the most stringent applicable federal or state ambient air quality standard, and are developed based on the ambient concentrations of that pollutant for each source receptor area (SRA) and distance to the nearest sensitive receptor. The mass rate look-up tables were developed for each SRA and can be used to determine whether or not a project may generate significant adverse localized air quality impacts. The LST mass rate look-up tables apply to projects that are less than or equal to five acres. If the project exceeds five acres or any applicable LST when the mass rate look-up tables are used as a screening analysis, then project-specific air quality modeling may be performed. The SCAQMD recommends that lead agencies perform project-specific air quality modeling for larger projects. The proposed Project area exceeds five acres in total size; therefore, Project-specific air quality modeling was used to assess localized construction impacts rather than the mass emission rate look-up tables.

The Project-specific air quality modeling of localized construction impacts was conducted consistent with SCAQMD methodology. The USEPA and SCAQMD-approved dispersion model, AMS/EPA Regulatory Model (AERMOD), was used to model the air quality impacts of CO, NO_X, SO_X, PM_{10}, and $PM_{2.5}$ emissions. AERMOD can estimate the air quality impacts of single or multiple point, area, or volume sources using historical meteorological conditions. Volume sources were used to represent the emissions from trucks, heavy-duty construction equipment, and fugitive dust. Volume sources are three-dimensional sources of emissions that can be used to model releases from a variety of industrial uses, including moving diesel trucks and equipment. To be conservative, this analysis did not calculate PM_{10} deposition. As construction of the proposed Project would take place in one year, maximum daily emissions that could occur due to construction activities were selected for the LST analysis. It was assumed that an average workday would result in 10 hours of emissions-generating activity. Therefore, the maximum daily emissions were divided by 10 to convert the maximum daily emissions into emission rates in units of pounds per hour.

Because of the shift in operations during construction of the proposed Project, emissions sources are located throughout the entire airport, and thus exceeds the five acres in total size. Therefore, Project-specific dispersion modeling was conducted to assess localized construction impacts. Dispersion of the on-airport emissions from aircraft was modeled using EDMS. EDMS is the FAA-required model for airport air quality analysis of aviation sources and was used to develop projected concentrations of on-airport air pollutants associated with the proposed Project. Outputs from the EDMS model were then input in the USEPA and SCAQMD-approved dispersion model, AMS/EPA Regulatory Model (AERMOD), to model the air quality impacts of CO, NO_X, SO_X, PM_{10}, and $PM_{2.5}$ emissions, consistent with SCAQMD methodology. Construction activity emissions were combined within AERMOD to determine localized impacts from combined construction activity and the shift in aircraft operations.

Source and Receptor Locations

Construction activities were assumed to be located at the Project site and staging/employee parking areas. Potential construction staging areas have been identified at three parcels around the Airport, as shown in **Figure 4.1-1**. An additional parcel to accommodate employee parking has also been identified. Assumptions regarding locations of construction staging and employee parking activities are shown in **Table 4.1-2**.

Table 4.1-2

Construction Staging Areas

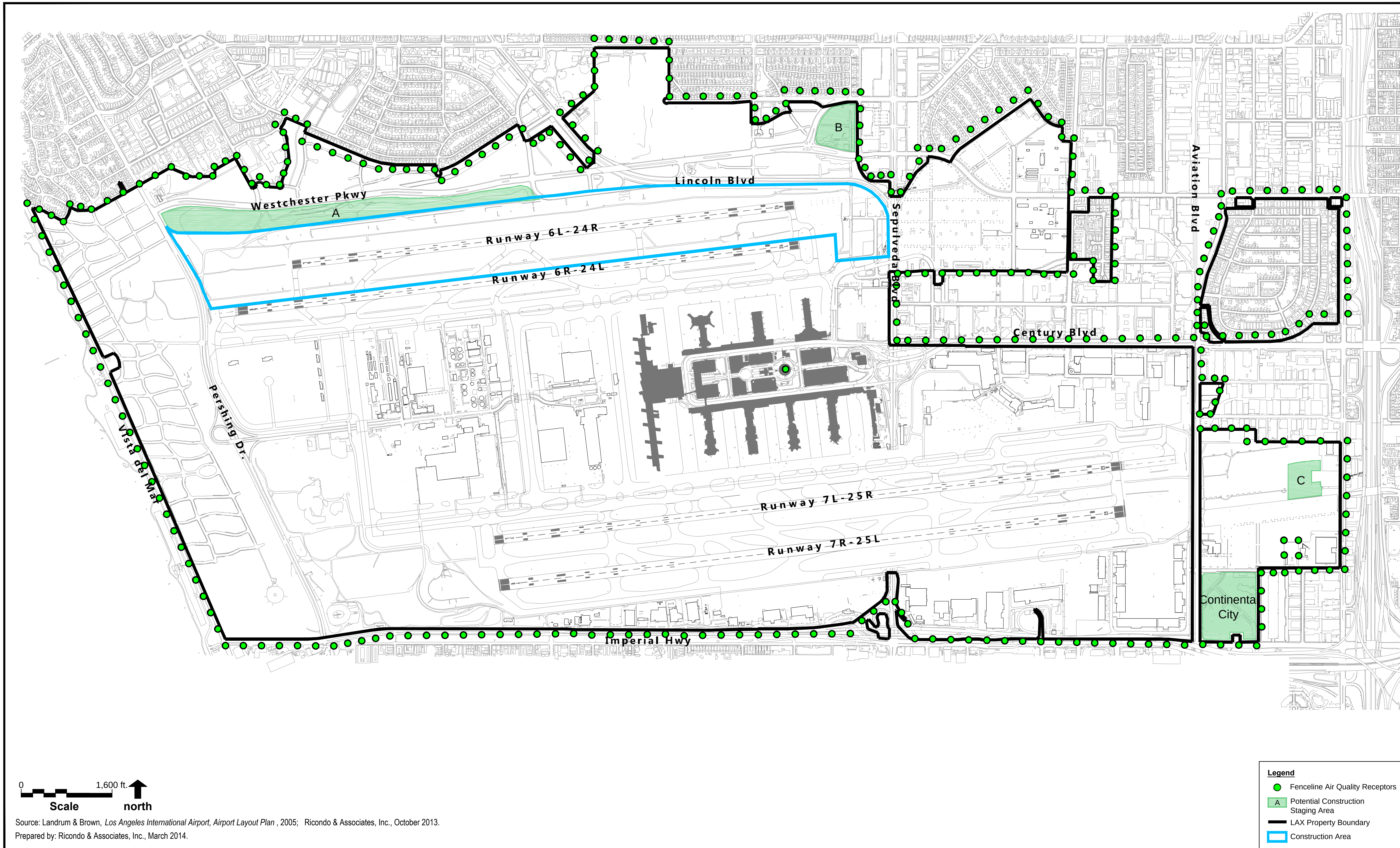
Staging Area	Materials Staging	Concrete Batch Plant	Employee Parking
Construction Staging Area “A”	80%	-	80%
Construction Staging Area “B”	20%	-	-
Continental City	-	100%	-
Employee Parking Lot “C”	-	-	20%

Source: Ricondo & Associates, Inc., 2014.

Operational emissions during the runway closure period were assumed to be located at the respective on-airport locations for individual sources. Aircraft operations were distributed between the taxiways and runways, as well as on the approach and departure paths. APU operations were located directly at the gates.

Receptor points are the geographic locations where the air dispersion model calculates air pollutant concentrations. These discrete Cartesian receptors were used to determine air quality impacts in the vicinity of the Project site.[12] Field receptors were placed at the boundary of LAX (along the fence line), as well as at the Theme Building, as shown in Figure 4.1-1.

12 Discrete Cartesian receptors are identified by their x (east-west) and y (north-south) coordinates and represent a specific location of interest.



Source: Landrum & Brown, *Los Angeles International Airport, Airport Layout Plan* , 2005; Ricondo & Associates, Inc., October 2013.

Prepared by: Ricondo & Associates, Inc., March 2014.

Runway 6L-24R and Runway 6R-24L Runway Safety Area and Associated Improvments Draft EIR	Construction Air Quality Analysis Fenceline Receptor Locations and Potential Staging Areas	Figure 4.1-1

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Meteorology

The meteorological data used in the analysis were obtained from the SCAQMD website, which was preprocessed using AERMET. AERMET is a meteorological preprocessor for organizing available meteorological data into a format suitable for use in the AERMOD air quality dispersion model. These files were also developed by the SCAQMD using site specific surface characteristics (i.e., surface albedo, surface roughness, and Bowen ratio)[13] obtained using AERSURFACE. AERSURFACE is a tool that provides realistic and reproducible surface characteristic values, including albedo, Bowen ratio, and surface roughness length, for input into AERMET. The data set used consisted of five years of hourly surface data collected at LAX for calendar years 2005, 2007, 2008, 2009, and 2011;[14] the data included ambient temperature, wind speed, wind direction, and atmospheric stability parameters, as well as mixing height parameters from the appropriate upper air station. All five years of meteorological data were loaded into AERMOD to determine the maximum concentrations for each pollutant and averaging period combination.

Ozone Limiting Method for NO_2 Modeling

AERMOD contains the ozone limiting method (OLM) and Plume Volume Molar Ratio Method (PVMRM) options, which are used to model the conversion of NO_X to NO_2. The OLM option was used in this modeling analysis. The SCAQMD provides hourly O_3 data for modeling conversion of NO_X to NO_2 using the OLM option. In addition, the following values were used in the analysis:

- Ambient Equilibrium NO_2/ NO_X Ratio: 0.90
- In-stack NO_2/ NO_X Ratio: 0.135[15]
- Default Ozone Value: 40 parts per billion (used only for missing data in the hourly O_3 data file provided by the SCAQMD)

Localized Significance Thresholds

The LSTs for NO_2 were developed based on the 1-hour NO_2 California Ambient Air Quality Standard (CAAQS) of 339 micrograms per cubic meter ($\mu g/m^3$). An exceedance of the 1-hour NO_2 National Ambient Air Quality Standard (NAAQS) is determined based on the USEPA standard, which is the 3-year average of the 98th percentile of the daily maximum 1-hour average. Because the 1-hour NO_2 NAAQS is evaluated over a three-year period, it is appropriately considered for construction activities that could last for multiple years. The 1-hour NO_2 NAAQS was considered in this analysis because of the anticipated construction duration of the proposed Project. The LSTs for CO were developed based on the 1-hour and 8-hour CAAQS of 23 milligrams per cubic meter (mg/m^3) and 10 mg/m^3, respectively. With respect to CO, the CAAQS are more stringent than the NAAQS; therefore, the NAAQS need not be

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13 The surface albedo is the portion of sunlight that is reflected; the Bowen ratio is the measure of moisture available for evaporation.

14 These represent the most recent five years with complete data; the data have passed the USEPA's requirement for 90 percent completeness by quarter for wind direction, wind speed, and temperature.

15 A site-specific NO_X to NO_2 ratio was developed for the LAX Runway 7L/25R RSA and Associated Improvements Project based on the project-specific sources contributing to the top 10% of receptors recording the highest NO_X concentrations. This same NOx to NO_2 ratio was utilized for this project given the similarities of the projects.

specifically addressed, but are included in the analysis. For PM_{10} and $PM_{2.5}$, the LSTs were derived based on requirements in SCAQMD Rule 403, Fugitive Dust.

4.1.3 Existing Conditions

4.1.3.1 Climatological Conditions

The airport is located within the South Coast Air Basin of California, a 6,745 square-mile area encompassing all of Orange County and the urban, non-desert portions of Los Angeles, Riverside, and San Bernardino Counties. The meteorological conditions at the airport are heavily influenced by the proximity of the airport to the Pacific Ocean to the west and the mountains to the north and east. This location tends to produce a regular daily reversal of wind direction: onshore (from the west) during the day and offshore (from the east) at night. Comparatively warm, moist Pacific air masses drifting over cooler air resulting from coastal upwelling of cooler water often form a bank of fog that is generally swept inland by the prevailing westerly (i.e., from the west) winds. The "marine layer" is generally 1,500 to 2,000 feet deep, extending only a short distance inland and rising during the morning hours producing a deck of low clouds. The air above is usually relatively warm, dry, and cloudless. The prevalent temperature inversion in the Basin tends to prevent vertical mixing of air through more than a shallow layer.

A dominating factor in the weather of California is the semi-permanent high-pressure area of the North Pacific Ocean. This pressure center moves northward in summer, holding storm tracks well to the north, and minimizing precipitation. Changes in the circulation pattern allow storm centers to approach California from the southwest during the winter months and large amounts of moisture are carried ashore. The Los Angeles region receives on average 10 to 15 inches of precipitation per year, of which 83 percent occurs during the months of November through March. Thunderstorms are light and infrequent, and on very rare occasions, trace amounts of snowfall have been reported at the airport.

The annual minimum mean, maximum mean, and overall mean temperatures at the airport are 55 degrees Fahrenheit (°F), 70°F, and 63°F, respectively. The prevailing wind direction at the airport is from the west-southwest with an average wind speed of roughly 6.4 knots (7.4 miles per hour [mph] or 3.3 meters per second [m/s]). Maximum recorded gusts range from 27 knots (31 mph or 13.9 m/s) in July to 54 knots (62 mph or 27.8 m/s) in March. The monthly average wind speeds range from 5.7 knots (6.5 mph or 2.9 m/s) in December to 7.4 knots (8.5 mph or 3.8 m/s) in April.[16]

4.1.3.2 Regulatory Setting

Air quality is regulated by federal, state, and local laws. In addition to rules and standards contained in the federal Clean Air Act (CAA) and the California Clean Air Act (CCAA), air quality in the Los Angeles region is subject to the rules and regulations established by CARB and SCAQMD with oversight provided by the USEPA, Region IX.

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16 Ruffner, J.A., Climates of the States: National Oceanic and Atmospheric Administration Narrative Summaries, Table, and Maps for Each State with Overview of State Climatologist Programs, Third Edition, Volume 1: Alabama-New Mexico, Gale Research Company, 1985.

Federal

The USEPA is responsible for implementation of the CAA. The CAA was first enacted in 1970 and has been amended numerous times in subsequent years (1977, 1990, and 1997). Under the authority granted by the CAA, USEPA has established NAAQS for the following criteria pollutants: O_3, NO_2, CO, SO_2, PM_{10}, and $PM_{2.5}$. **Table 4.1-3** presents the NAAQS that are currently in effect for criteria air pollutants. As discussed previously, O_3 is a secondary pollutant, meaning that it is formed from reactions of "precursor" compounds under certain conditions. The primary precursor compounds that can lead to the formation of O_3 are VOCs and NO_X.

The CAA also specifies future dates for achieving compliance with the NAAQS and mandates that states submit and implement a State Implementation Plan (SIP) for local areas not meeting these standards. These plans must include pollution control measures that demonstrate how the standards will be met. The 1990 amendments to the CAA identify specific emission reduction goals for areas not meeting the NAAQS. These amendments require both a demonstration of reasonable further progress toward attainment and incorporation of additional sanctions for failure to attain or meet interim milestones.

Table 4.1-3

National and California Ambient Air Quality Standards (NAAQS and CAAQS)

			NAAQS	
Pollutant	**Averaging Time**	**CAAQS**	**Primary**	**Secondary**
Ozone (O_3)	8-hour	0.07 ppm (137 µg/m^3)	0.075 ppm (147 µg/m^3)	Same as Primary
	1-Hour	0.09 ppm (180 µg/m^3)	N/A	N/A
Carbon Monoxide (CO)	8-hour	9.0 ppm (10 mg/m^3)	9.0 ppm (10 mg/m^3)	N/A
	1-Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	N/A
Nitrogen Dioxide (NO_2)	Annual	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)	Same as Primary
	1-Hour	0.18 ppm (339 µg/m^3)	100 ppb (188 µg/m^3)	N/A [1]
Sulfur Dioxide (SO_2) [2]	Annual	N/A	0.03 ppm (80 µg/m^3)	N/A
	24-Hour	0.04 ppm (105 µg/m^3)	0.14 ppm (365 µg/m^3)	N/A
	3-Hour	N/A	N/A	0.5 ppm (1300 µg/m3)
	1-Hour	0.25 ppm (655 µg/m^3)	75 ppb (196 µg/m^3)	N/A
Respirable Particulate Matter (PM_{10})	AAM	20 µg/m^3	N/A	N/A
	24-Hour	50 µg/m^3	150 µg/m^3	Same as Primary
Fine Particulate Matter ($PM_{2.5}$)	AAM	12 µg/m^3	15 µg/m^3	Same as Primary
	24-Hour	N/A	35 µg/m^3	Same as Primary
Lead (Pb)	Rolling 3-month Average	N/A	1.5 µg/m^3	Same as Primary
	Monthly	1.5 µg/m^3	N/A	N/A
Sulfates	24-Hour	25 µg/m^3	N/A	N/A

Notes:

Table 4.1-3

National and California Ambient Air Quality Standards (NAAQS and CAAQS)

NAAQS = National Ambient Air Quality Standards
CAAQS = California Ambient Air Quality Standards
ppm = parts per million (by volume)
µg/m^3 = micrograms per cubic meter
N/A = Not applicable
mg/m^3 = milligrams per cubic meter
AAM = Annual arithmetic mean

1 On March 20, 2012, the USEPA took final action to retain the current secondary NAAQS for NO_2 (0.053 ppm averaged over a year) and SO_2 (0.5 ppm averaged over three hours, not to be exceeded more than once per year) (77 Federal Register [FR] 20264).

2 On June 22, 2010, the 1-hour SO_2 NAAQS was updated and the previous 24-hour and annual primary NAAQS were revoked. The previous 1971 SO_2 NAAQS (24-hour: 0.14 ppm; annual: 0.030 ppm) remain in effect until one year after an area is designated for the 2010 NAAQS (75 FR 35520).

Source: California Air Resources Board, Ambient Air Quality Standards Chart, Available at: http://www.arb.ca.gov/research/aaqs/aaqs2.pdf. Accessed April 12, 2013.

LAX is located in the Basin, which is designated as a federal nonattainment area for O_3, $PM_{2.5}$, and Pb. Nonattainment designations under the CAA for O_3 are classified into levels of severity based on the level of concentration above the standard, which is also used to set the required attainment date. The Los Angeles Basin is classified as an extreme nonattainment area for O_3. The Basin was reclassified on September 22, 1998 to attainment/maintenance for NO_2 and on June 11, 2007 for CO since concentrations of these pollutants dropped below the NO_2 and CO NAAQS for several years. More recently, the Los Angeles Basin was reclassified to attainment/maintenance for PM_{10} on July 26, 2013.[17] Attainment/maintenance means that the pollutant is currently in attainment and that measures are included in the SIP to ensure that the NAAQS for that pollutant are not exceeded again (maintained). The attainment status with regard to the NAAQS is presented in **Table 4.1-4** for each criteria pollutant.

[17] U.S. Environmental Protection Agency, Approval and Promulgation of Implementation Plans; Designation of Areas for Air Quality Planning Purposes; California; South Coast Air Basin; Approval of PM_{10} Maintenance Plan and Redesignation to Attainment for the PM_{10} Standard, *Federal Register,* Vol. 78, No. 123, June 26, 2013, pp. 38223-38226.

Table 4.1-4

South Coast Air Basin Attainment Status

Pollutant	National Standards (NAAQS) [1]	California Standards (CAAQS) [2]
Ozone	Nonattainment - Extreme	Nonattainment
Carbon Monoxide	Attainment - Maintenance	Attainment
Nitrogen Dioxide	Attainment - Maintenance	Nonattainment
Sulfur Dioxide	Attainment	Attainment
PM_{10}	Attainment - Maintenance	Nonattainment
$PM_{2.5}$	Nonattainment	Nonattainment
Lead	Nonattainment	Nonattainment

Notes:

1 Status as of July 31, 2013.
2 Effective April 1, 2013.

Sources: U.S. Environmental Protection Agency. Green Book. Available at http://www.epa.gov/air/oaqps/greenbook/index.html. As of July 31, 2013; California Air Resources Board. "Area Designations Maps/State and National." Available at www.arb.ca.gov/desig/adm/adm.htm. Effective 04/01/1013.

State

The CCAA, signed into law in 1988, requires all areas of the state to achieve and maintain the CAAQS by the earliest practicable date. The CAAQS are generally as stringent as, and in several cases more stringent than, the NAAQS; however, in the case of short-term standards for NO_2 and SO_2, the CAAQS are less stringent than the NAAQS. The currently applicable CAAQS are presented with the NAAQS in Table 4.1-3. The attainment status with regard to the CAAQS is presented in Table 4.1-4 for each criteria pollutant. CARB has been granted jurisdiction over a number of air pollutant emission sources that operate in the state. Specifically, CARB has the authority to develop emission standards for on-road motor vehicles, as well as for stationary sources and some off-road mobile sources. In turn, CARB has granted authority to the regional air pollution control and air quality management district's to develop stationary source emission standards, issue air quality permits, and enforce permit conditions.

South Coast Air Quality Management District

SCAQMD has jurisdiction over an area of 10,743 square miles consisting of Orange County and the urban, non-desert portions of Los Angeles, Riverside, and San Bernardino Counties, and the Riverside County portions of the Salton Sea Air Basin and Mojave Desert Air Basin. The Basin is a sub-region of SCAQMD's jurisdiction and covers an area of 6,745 square miles. While air quality in this area has improved, the Basin requires continued diligence to meet air quality standards.

The SCAQMD has adopted a series of Air Quality Management Plans (AQMPs) to meet the CAAQS and NAAQS. SCAQMD and CARB have adopted the 2012 AQMP which incorporates the latest scientific and technological information and planning assumptions, including the 2012-

2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), and updated emission inventory methodologies for various source categories.[18] The Final 2012 AQMP was adopted by the AQMD Governing Board on December 7, 2012. Therefore, the 2012 AQMP is the most appropriate plan to use for consistency analysis. The AQMP builds upon other agencies' plans to achieve federal standards for air quality in the Basin. It incorporates a comprehensive strategy aimed at controlling pollution from all sources, including stationary sources, and on-road and off-road mobile sources. The 2012 AQMP builds upon improvements in previous plans, and includes new and changing federal requirements, implementation of new technology measures, and the continued development of economically sound, flexible compliance approaches. In addition, it highlights the significant amount of emission reductions needed and the urgent need to identify additional strategies, especially in the area of mobile sources, to meet all federal criteria pollutant standards within the timeframes allowed under the federal CAA.

The 2012 AQMP's key undertaking is to bring the Basin into attainment with NAAQS for 24-hour $PM_{2.5}$ by 2014. It also intensifies the scope and pace of continued air quality improvement efforts toward meeting the 2023 8-hour O_3 standard deadline with new measures designed to reduce reliance on the CAA Section 182(e)(5) long-term measures for NO_X and VOC reductions. SCAQMD expects exposure reductions to be achieved through implementation of new and advanced control technologies as well as improvement of existing technologies.

The control measures in the 2012 AQMP consist of four components: 1) Basin-wide and Episodic Short-term $PM_{2.5}$ Measures; 2) Contingency Measures; 3) 8-hour O_3 Implementation Measures; and 4) Transportation and Control Measures provided by the Southern California Association of Governments (SCAG). The Plan includes eight short-term $PM_{2.5}$ control measures, 16 stationary source 8-hour O_3 measures, 10 early action measures for mobile sources and seven early action measures proposed to accelerate near-zero and zero emission technologies for goods movement-related sources, and five on-road and five off-road mobile source control measures. In general, the District's control strategy for stationary and mobile sources is based on the following approaches: 1) available cleaner technologies; 2) best management practices; 3) incentive programs; 4) development and implementation of zero-near-zero technologies and vehicles and control methods; and 5) emission reductions from mobile sources.

The SCAQMD also adopts rules to implement portions of the AQMP. At least one of these rules is applicable to the construction of the proposed Project. Rule 403 requires the implementation of best available fugitive dust control measures during active construction activities capable of generating fugitive dust emissions from on-site earth-moving activities, construction/demolition activities, and construction equipment travel on paved and unpaved roads. Also, SCAQMD Rule 1113 limits the amount of volatile organic compounds from architectural coatings and solvents, which lowers the emissions of odorous compounds.

Southern California Association of Governments

SCAG is the metropolitan planning organization (MPO) for Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial Counties and serves as a forum for the discussion of

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[18] South Coast Air Quality Management District, Vision for Clean Air: A Framework for Air Quality and Climate Planning, Available at: http://www.aqmd.gov/aqmp/2012aqmp/VisionDocument/, Accessed January 7, 2014.

regional issues related to transportation, the economy, community development, and the environment. As the federally-designated MPO for the Southern California region, SCAG is mandated by the federal government to research and develop plans for transportation, hazardous waste management, and air quality. Pursuant to California Health and Safety Code 40460(b), SCAG has the responsibility for preparing and approving the portions of the AQMP relating to regional demographic projections and integrated regional land use, housing, employment, and transportation programs, measures, and strategies. SCAG is also responsible under the CAA for determining conformity of transportation projects, plans, and programs with applicable air quality plans. With regard to air quality planning, SCAG has prepared the 2012-2035 RTP/SCS, which addresses regional development and growth forecasts.

Other Related Rules and Policies

In the Basin, the City of Los Angeles, CARB, and the SCAQMD have adopted or proposed additional rules and policies governing the use of cleaner fuels in public vehicle fleets. The City of Los Angeles Policy CF#00-0157 requires that City-owned or operated diesel-fueled vehicles be equipped with particulate traps and that they use ultra-low-sulfur diesel fuel. CARB has adopted a Risk Reduction Plan for diesel-fueled engines and vehicles. The SCAQMD has proposed a series of rules that would require the use of clean fuel technologies in on-road school buses, on-road heavy-duty public fleets, and street sweepers. This analysis includes the use of diesel particulate traps.

4.1.3.3 Existing Ambient Air Quality

In an effort to monitor the various concentrations of air pollutants throughout the basin, the SCAQMD has divided the region into 38 Source Receptor Areas in which monitoring stations operate. The monitoring station that is most representative of existing air quality conditions in the Project area is the Southwest Coastal Los Angeles Monitoring Station located at 7201 W. Westchester Parkway (referred to as the LAX Hastings site), less than 0.5-mile from Runway 6L-24R (northernmost LAX runway). Criteria pollutants monitored at this station include O_3, CO, SO_2, NO_2, and PM_{10}. The nearest representative monitoring station that monitors $PM_{2.5}$ is the South Coastal Los Angeles County 1 Station, which is located at 1305 E. Pacific Coast Highway (Long Beach). The most recent data available from the SCAQMD for these monitoring stations encompassed the years 2008 to 2012, as shown in **Table 4.1-5**.

The data shows the following pollutant trends (refer to Table 4.1-3 for NAAQS and CAAQS standards):

Table 4.1-5

Southwest Coastal Los Angeles and South Coastal Los Angeles County Monitoring Station Ambient Air Quality Data

Pollutant [1,2]	2008	2009	2010	2011	2012
Ozone (O_3)					
Maximum Concentration 1-hr period, ppm	0.086	0.077	0.089	0.078	0.106
Days over State Standard (0.09 ppm)	0	0	0	0	1
Maximum National Concentration 8-hr period, ppm	0.075	0.070	0.070	0.067	0.075
Days over Federal Standard (0.075 ppm)	0	0	0	0	0
Maximum California Concentration 8-hr period, ppm	0.076	0.070	0.070	0.067	0.075

Table 4.1-5

Southwest Coastal Los Angeles and South Coastal Los Angeles County Monitoring Station Ambient Air Quality Data

Pollutant [1,2]	2008	2009	2010	2011	2012
Days over State Standard (0.07 ppm)	1	0	0	0	1
Carbon Monoxide (CO)					
Maximum Concentration 1-hr period, ppm	3.6	2.6	2.6	2.3	2.8
Days over State Standard (20.0 ppm)	0	0	0	0	0
Maximum Concentration 8-hr period, ppm	2.53	1.99	2.19	1.79	1.51
Days over State Standard (9.0 ppm)	0	0	0	0	0
Nitrogen Dioxide (NO_2)					
Maximum Concentration 1-hr period, ppm	0.094	0.077	0.076	0.098	0.098
98th Percentile Concentration 1-hr period, ppm	N/A	0.070	0.061	0.065	0.055
Days over State Standard (0.18 ppm)	0	0	0	0	0
Annual Arithmetic Mean (AAM), ppm	0.014	---	0.012	0.013	0.010
Exceed State Standard? (0.030 ppm)	No	No	No	No	No
Sulfur Dioxide (SO_2)					
Maximum Concentration 1-hr period, ppm	0.021	0.022	0.026	0.011	0.005
Days over State Standard (75 ppb)	0	0	0	0	0
99th Percentile Concentration 1-hr period, ppm	N/A	0.012	0.016	0.008	N/A
Maximum Concentration 24-hr period, ppm	0.004	0.006	0.004	0.002	0.001
Days over State Standard (140 ppb)	0	0	0	0	0
Annual Arithmetic Mean (AAM), ppm	0.001	---	0.000	0.000	0.000
Respirable Particulate Matter (PM_{10}) [3]					
Maximum National Concentration 24-hr period, µg/m^3	50	52	37	41	31
Days over Federal Standard (150 µg/m^3)	0	0	0	0	0
Maximum California Concentration 24-hr period, µg/m^3	50	52	37	41	30
Days over State Standard (50 µg/m^3)	0	6	*	0	0
Annual National Concentration, µg/m^3	25.6	25.6	20.6	21.7	19.8
Annual California Concentration, µg/m^3	25.5	25.5	---	21.4	19.5
Exceed State Standard? (20 µg/m^3)	Yes	Yes	*	Yes	No
Fine Particulate Matter ($PM_{2.5}$) [3]					
Maximum National Concentration 24-hr period, µg/m^3	57.2	63.0	35.0	39.7	49.8
Days over Federal Standard (35 µg/m^3)	8	6	0	2	4
Maximum California Concentration 24-hr period, µg/m^3	57.2	63.0	35.0	39.7	49.8
Annual National Concentration, µg/m^3	14.1	12.8	10.3	11.3	10.4
Exceed State Standard? (12 µg/m^3)	Yes	Yes	No	No	No

Notes:

AAM = Annual arithmetic mean
ppb = parts per billion (by volume)
ppm = parts per million (by volume)
µg/m^3 = micrograms per cubic meter
* = insufficient data to determine the value
N/A = not applicable

1 Monitoring data from the Southwest Coastal Los Angeles Station (Station No. 820) was used for O_3, CO, NO_2, SO_2, and PM_{10} concentrations. Monitoring Data from the South Coastal Los Angeles County 1 Monitoring Station (Station No. 072) was used for $PM_{2.5}$ concentrations.

2 An exceedance is not necessarily a violation. Violations are defined in 40 CFR 50 for NAAQS and 17 CCR 70200 for CAAQS.

3 Statistics may include data that are related to an exceptional event.

Source: California Air Resource Board, iADAM: Air Quality Data Statistics, Available at: www.arb.ca.gov/adam/, Accessed March 24, 2014; California Air Resource Board, AQMIS2, Available at: www.arb.ca.gov/aqmis2/aqmis2.php, Accessed March 24, 2014.

Ozone - The maximum 1-hour O_3 concentration recorded during the 2008 to 2012 period was 0.106 ppm, recorded in 2012. During the reporting period, the California standard was exceeded once. The maximum 8-hour O_3 concentration was 0.076 ppm recorded in 2008. The California standards were exceeded twice during the reporting period, while the NAAQS were not violated.

Carbon Monoxide - The highest 1-hour CO concentration recorded was 3.6 ppm, recorded in 2008. The maximum 8-hour CO concentration recorded was 2.53 ppm recorded in 2008. As demonstrated by the data, the standards were not exceeded during the five-year period.

Nitrogen Dioxide - The highest 1-hour NO_2 concentration recorded was 0.098 ppm in both 2011 and 2012. The maximum 98^{th} percentile 1-hour concentration was 0.070 ppm, recorded in 2009. The highest recorded NO_2 annual arithmetic mean was 0.014 ppm recorded in 2008. As shown, the standards were not exceeded during the five-year period.

Sulfur Dioxide - The highest 1-hour concentration of SO_2 was 0.026 ppm recorded in 2010, while the highest 99^{th} percentile 1-hour concentration recorded was 0.016 ppm in 2010. The maximum 24-hour concentration was 0.006 ppm, recorded in 2009. The highest annual arithmetic mean concentration was 0.001, recorded in 2008. As shown, the standards were not exceeded during the five-year period.

Respirable Particulate Matter (PM_{10}) - The highest recorded 24-hour PM_{10} concentration recorded was 52 $\mu g/m^3$ in 2009. During the period 2008 to 2012, the CAAQS for 24-hour PM_{10} was exceeded 6 days in 2009 but no days any other year; the NAAQS was not violated. The maximum annual arithmetic mean recorded was 25.6 $\mu g/m^3$ in 2008 and 2009.

Fine Particulates ($PM_{2.5}$) - The maximum 24-hour $PM_{2.5}$ concentration recorded was 63.0 $\mu g/m^3$ in 2009. The 24-hour NAAQS was exceeded between 0 and 8 days annually from 2008-2012. The highest annual arithmetic mean of 14.1 was recorded in 2008.

4.1.3.4 Existing Airport Emissions

The existing (2012) airport-related emissions, including those from aircraft, GSE and APU operations, on-airport roadways, and stationary sources, are shown in **Table 4.1-6**.

4.1.4 <u>Thresholds of Significance</u>

The SCAQMD has developed CEQA construction and operational-related thresholds of significance for air pollutant emissions from projects proposed in the Basin. Construction and operational emission thresholds are summarized in **Table 4.1-7**. In accordance with the SCAQMD *CEQA Air Quality Handbook*, a significant air quality impact would occur if the estimated incremental increase in construction-related or operations-related emissions attributable to the proposed Project would be greater than the daily emission thresholds presented in Table 4.1-7.

Table 4.1-6

Existing (2012) Airport Emissions

Emission Source	Peak Daily Emissions (lbs/day)					
	CO	VOC	NO_X	SO_2	PM_{10}	$PM_{2.5}$
Aircraft	15,598	2,599	17,517	1,700	244	244
Ground Support Equipment	3,572	251	1,417	2	58	56
Auxiliary Power Units	563	47	550	75	76	76
Busing Operations	2	<1	13	<1	<1	<1
On-Airport Roadways [1]	681	80	1,481	<1	30	28
On-Airport Subtotal	20,417	2,980	20, 978	1,776	409	405

Note:

1 Emissions from traffic within the central terminal area (CTA) only.

Source: Ricondo & Associates, Inc., 2013.

Table 4.1-7

SCAQMD CEQA Thresholds of Significance for Air Pollutant Emissions in the South Coast Air Basin

Pollutant	Mass Emission Thresholds lbs/day	
	Construction	Operations
Carbon monoxide, CO	550	550
Volatile organic compounds, VOC [1]	75	55
Nitrogen oxides, NO_X	100	55
Sulfur dioxide, SO_2	150	150
Respirable particulate matter, PM_{10}	150	150
Fine particulate Matter, $PM_{2.5}$	55	55
Lead, Pb [2]	3	3

Notes:

1 The emissions of VOCs and reactive organic gases are essentially the same for the combustion emission sources that are considered in this EIR. This EIR will typically refer to organic emissions as VOCs.

2 The only source of lead emissions from LAX is from aviation gasoline (AvGas) associated with piston-engine general aviation aircraft; however, due to the low number of piston-engine general aviation aircraft operations at LAX, AvGas quantities are low and emissions from these sources would not be materially affected by the Project.

Source: South Coast Air Quality Management District, “SCAQMD Air Quality Significance Thresholds,” March 2011. Available at: www.aqmd.gov/ceqa/handbook/signthres.pdf, Accessed October 28, 2013.

The SCAQMD has also developed operational and construction-related thresholds of significance[19] for air pollutant concentration impacts from projects proposed in the Basin. These thresholds are summarized in **Table 4.1-8**. In accordance with the SCAQMD *CEQA Air Quality Handbook*, a significant air quality impact would occur if the estimated incremental ambient concentrations due to construction-related or operations-related emissions would be greater than the concentration thresholds presented in Table 4.1-8. The SCAQMD's recommended thresholds for the evaluation of localized air quality impacts are based on the difference between the maximum monitored ambient pollutant concentrations in the area and the CAAQS or NAAQS. Therefore, the thresholds depend upon the concentrations of pollutants monitored locally with respect to a project site. For pollutants that already exceed the CAAQS or NAAQS (e.g., PM_{10} and $PM_{2.5}$), the thresholds are based on SCAQMD Rule 403 for construction and Rule 1303, Table A-2 for operations as described in the *Final Localized Significance Threshold Methodology*.

The methodology requires that the anticipated increase in ambient air concentrations, determined using a computer-based air quality dispersion model, be compared to localized significance thresholds for PM_{10}, $PM_{2.5}$, NO_2, and CO.[20] The significance threshold for PM_{10} represents compliance with Rule 403 (Fugitive Dust) and Rule 1303 (New Source Review Requirements), while the thresholds for NO_2 and CO represent the allowable increase in concentrations above background levels in the vicinity of the Project site that would not cause or contribute to an exceedance of the relevant ambient air quality standards. The significance thresholds for $PM_{2.5}$ are intended to constrain emissions so as to aid in the progress toward attainment of the ambient air quality standards.[21] For the purposes of this analysis, the localized construction and operations emissions resulting from development of the proposed Project are assessed with respect to the thresholds in Table 4.1-8 using dispersion modeling (i.e., AERMOD).

Table 4.1-8

SCAQMD CEQA Thresholds of Significance for Air Pollutant Concentrations in the South Coast Air Basin

	Project-Related Concentration Thresholds [1]			
Pollutant	**Averaging Period**	**Construction**	**Operations**	**Project Only or Total**
PM_{10}	Annual	1.0 μg/m^3	1.0 μg/m^3	Project Only
PM_{10}	24-hour	10.4 μg/m^3	2.5 μg/m^3	Project Only
$PM_{2.5}$	24-hour	10.4 μg/m^3	2.5 μg/m^3	Project Only
CO	1-hour	20 ppm (23 mg/m^3)	20 ppm (23 mg/m^3)	Total incl. Background
CO	8-hour	9.0 ppm (10 mg/m^3)	9.0 ppm (10 mg/m^3)	Total incl. Background

19 South Coast Air Quality Management District, CEQA Air Quality Handbook, 1993; as updated by SCAQMD Air Quality Significance Thresholds, March 2011, Available at: http://www.aqmd.gov/CEQA/handbook/signthres.pdf.

20 South Coast Air Quality Management District, Final Localized Significance Threshold Methodology, (2008).

21 South Coast Air Quality Management District, Final Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds, October 2006, Available at: www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html. Accessed February 27, 2013).

Table 4.1-8

SCAQMD CEQA Thresholds of Significance for Air Pollutant Concentrations in the South Coast Air Basin

	Project-Related Concentration Thresholds [1]			
Pollutant	**Averaging Period**	**Construction**	**Operations**	**Project Only or Total**
NO_2	1-hour (State)	0.18 ppm (339 µg/m^3)	0.18 ppm (339 µg/m^3)	Total incl. Background
NO_2	1-hour (Federal) [3]	0.100 ppm (188 µg/m^3)	0.100 ppm (188 µg/m^3)	Total incl. Background
NO_2	Annual (State) [2]	0.030 ppm (57 µg/m^3)	0.030 ppm (57 µg/m^3)	Total incl. Background
SO_2	1-hour (State)	0.25 ppm (655 µg/m^3)	0.25 ppm (655 µg/m^3)	Total incl. Background
SO_2	1-hour (Federal) [4]	0.075 ppm (196 µg/m^3)	0.075 ppm (196 µg/m^3)	Total incl. Background
SO_2	24-hour	0.04 ppm (105 µg/m^3)	0.04 ppm (105 µg/m^3)	Total incl. Background

Notes:

1 The concentration threshold for CO and NO_2 is the CAAQS, which is at least as stringent as the NAAQS. The concentration threshold for PM_{10} and $PM_{2.5}$ has been developed by SCAQMD for construction or operational impacts associated with proposed projects.

2 The State standard is more stringent than the federal standard.

3 To evaluate impacts of the proposed Project to ambient 1-hour NO_2 levels, the analysis includes both the current SCAQMD 1-hour State NO_2 threshold and the more stringent revised 1-hour federal ambient air quality standard of 188 µg/m^3. To attain the federal standard, the 3-year average of 98th percentile of the daily maximum 1-hour average at a receptor must not exceed 0.100 ppm.

4 To attain the SO_2 federal 1-hour standard, the 3-year average of the 99th percentile of the daily maximum 1-hour averages at a receptor must not exceed 0.075 ppm.

Source: SCAQMD, 1993, 2011; USEPA, 2010a (75 FR 6474, Primary National Ambient Air Quality Standards for Nitrogen Dioxide, Final Rule, February 9, 2010) and 2010b (75 FR 35520, Primary National Ambient Air Quality Standard for Sulfur Dioxide, Final Rule, June 22, 2010).

4.1.5 Applicable LAX Master Plan Commitments and Mitigation Measures

As part of the LAX Master Plan, LAWA adopted commitments and control measures pertaining to air quality (denoted with "AQ") in the Alternative D MMRP. Of the three commitments and four control measures that were designed to address air quality impacts related to implementation of the LAX Master Plan, none of the commitments are applicable to the proposed Project, but two of the control measures were considered in the air quality analysis herein (denoted below as LAX-AQ-1 and LAX-AQ-2). The portions of the air quality control measures that would be applicable to the proposed Project are summarized below in **Tables 4.1-9** and **4.1-10**.

LAX-AQ-1 – General Air Quality Control Measures

- This measure describes a variety of specific actions to reduce air quality impacts associated with projects at LAX, and applies to all projects. Some components of LAX-AQ-1 are not readily quantifiable, but would be implemented as part of LAX Master Plan projects. Specific measures applicable to the Project are identified in **Table 4.1-9**.

Table 4.1-9

General Air Quality Control Measures [1]

Measure Number	Measure	Type of Measure	Quantified Emissions Reductions
1a	Watering (per SCAQMD Rule 403 and CalEEMod default) – two times daily.	Fugitive Dust	55% PM_{10} and $PM_{2.5}$
1b	Ultra-low sulfur diesel (ULSD) fuel will be used in construction equipment.	On- and Off-Road Mobile	Assumed in modeling
1c	Post a publicly visible sign with the telephone number and person to contact regarding dust complaints; this person shall respond and take corrective action within 24 hours.	Fugitive Dust	NQ
1d	Prior to final occupancy, the applicant demonstrates that all ground surfaces are covered or treated sufficiently to minimize fugitive dust emissions.	Fugitive Dust	NQ
1e	All roadways, driveways, sidewalks, etc., being installed as part of the project should be completed as soon as possible; in addition, building pads should be laid as soon as possible after grading.	Fugitive Dust	NQ
1f	Prohibit idling or queuing of diesel-fueled vehicles and equipment in excess of five minutes. This requirement will be included in specifications for any LAX projects requiring on-site construction.[2]	On- and Off-Road Mobile	NQ
1g	Require that all construction equipment working on-site is properly maintained (including engine tuning) at all times in accordance with manufacturers' specifications and schedules.	Mobile and Stationary	NQ

Notes:
NQ = Not Quantified
1 These measures are from LAX Master Plan Mitigation Measure MM-AQ-1, unless otherwise noted.
2 From LAX Master Plan Mitigation Measure MM-AQ-2 and Community Benefits Agreement Measure X.M and LAWA's Design and Construction Handbook, Section 1.31.9.

Sources: City of Los Angeles, Los Angeles World Airports (LAWA), and FAA, Final Environmental Impact Statement/Final Environmental Impact Report, Los Angeles International Airport Proposed Master Plan Improvements, April 2004; Los Angeles World Airports and LAX Coalition for Economic, Environmental, and Educational Justice, Cooperation Agreement, Los Angeles International Airport Master Plan Program, December 2004; Los Angeles World Airports, Design and Construction Handbook, November 2012.

LAX-AQ-2 – LAX Master Plan - Mitigation Plan for Air Quality; Construction-Related Measures

- This measure describes numerous specific actions to reduce fugitive dust emissions and exhaust emissions from on-road and off-road mobile and stationary sources used in construction. Some components of LAX-AQ-2 are not readily quantifiable, but are being implemented as part of LAX Master Plan projects. These control strategies are expected to reduce construction-related emissions. Specific measures applicable to the Project are identified in **Table 4.1-10**.

Table 4.1-10

Construction-Related Control Measures [1]

Measure Number	Measure	Type of Measure	Quantified Emissions Reductions
2a	All diesel-fueled equipment used for construction will be outfitted with the best available emission control devices, where technologically feasible, primarily to reduce emissions of diesel particulate matter (DPM), including fine PM ($PM_{2.5}$), and secondarily, to reduce emissions of NO_X. This requirement shall apply to diesel-fueled off-road equipment (such as construction machinery), diesel-fueled on-road vehicles (such as trucks), and stationary diesel-fueled engines (such as electric generators). (It is unlikely that this measure will apply to equipment with Tier 4 engines.) The emission control devices utilized in construction equipment shall be verified or certified by CARB or USEPA for use in on- road or off-road vehicles or engines. For multi-year construction projects, a reassessment shall be conducted annually to determine what constitutes a best available emissions control device.[2]	Off-Road Mobile	85% PM_{10} and $PM_{2.5}$, adjusted for compatibility
2b	Watering (per SCAQMD Rule 403 and CalEEMod default) – three times daily.	Fugitive Dust	61% PM_{10} and $PM_{2.5}$
2c	Pave all construction access roads at least 100 feet onto the site from the main road.	Fugitive Dust	NQ
2d	To the extent feasible, have construction employees' work/commute during off-peak hours.	On-Road Mobile	NQ
2e	Make available on-site lunch trucks during construction to minimize off-site worker vehicle trips.	On-Road Mobile	NQ
2f	Utilize on-site rock crushing facility, when feasible, during construction to reuse rock/concrete and minimize off-site truck haul trips.	On-Road Mobile	NQ
2g	Specify combination of electricity from power poles and portable diesel- or gasoline-fueled generators using "clean burning diesel" fuel and exhaust emission controls.[3]	Stationary Point Source Controls	NQ
2h	Suspend use of all construction equipment during a second-stage smog alert in the immediate vicinity of LAX.	Mobile and Stationary	NQ
2i	Utilize construction equipment having the minimum practical engine size (i.e., lowest appropriate horsepower rating for intended job).	Mobile and Stationary	NQ
2j	Prohibit tampering with construction equipment to increase horsepower or to defeat emission control devices.	Mobile and Stationary	NQ
2k	The contractor or builder shall designate a person or persons to ensure the implementation of all components of the construction-related measure through direct inspections, record reviews, and investigations of complaints.	Administrative	NQ

Table 4.1-10

Construction-Related Control Measures [1]

Measure Number	Measure	Type of Measure	Quantified Emissions Reductions
2l	LAWA will locate rock-crushing operations and construction material stockpiles for all LAX-related construction in areas away from LAX-adjacent residents, to the extent possible, to reduce impacts from emissions of fugitive dust.[4]	Stationary	Can be quantified in modeling assumptions
2m	LAWA will ensure that there is available and sufficient infrastructure on-site, where not operationally or technically infeasible, to provide fuel to alternative-fueled vehicles to meet all requests for alternative fuels from contractors and other users of LAX. This will apply to construction equipment and to operations-related vehicles on-site. This provision will apply in conjunction with construction or modification of passenger gates related to implementation of the LAX Master Plan relative to the provision of appropriate infrastructure for electric GSE.[5]	Mobile	NQ
2n	On-road trucks used on LAX construction projects with a gross vehicle weight rating of at least 19,500 pounds shall, at a minimum, comply with USEPA 2007 on-road emissions standards for PM_{10} and NO_X.[6]	On-Road Mobile	Assumed in modeling
2o	Prior to January 1, 2015, all off-road diesel-powered construction equipment greater than 50 horsepower shall meet USEPA Tier 3 off-road emission standards. After December 31, 2014, all off-road diesel-power construction equipment greater than 50 horsepower shall meet USEPA Tier 4 off-road emissions standards. Tier 4 equipment shall be considered based on availability at the time the construction bid is issued. LAWA will encourage construction contractors to apply for SCAQMD "SOON" funds to accelerate clean-up of off-road diesel engine emissions.[7]	Off-Road Mobile	Assumed in modeling

Notes:
NQ = Not Quantified
1 These measures are from LAX Master Plan Mitigation Measure MM-AQ-2, unless otherwise noted.
2 From LAX Master Plan Mitigation Measure MM-AQ-2 and Community Benefits Agreement Measure X.F.
3 From LAX Master Plan Mitigation Measure MM-AQ-2 and LAWA's Design and Construction Handbook, Section 1.31.9.
4 From Community Benefits Agreement Measure X.L.
5 From Community Benefits Agreement Measure X.N.
6 From LAX Specific Plan Amendment Study Measure MM-AQ (SPAS)-1.
7 From LAX Specific Plan Amendment Study Measure MM-AQ (SPAS)-1.

Sources: City of Los Angeles, Los Angeles World Airports (LAWA), and FAA, Final Environmental Impact Statement/Final Environmental Impact Report, Los Angeles International Airport Proposed Master Plan Improvements, April 2004; Los Angeles World Airports and LAX Coalition for Economic, Environmental, and Educational Justice, Cooperation Agreement, Los Angeles International Airport Master Plan Program, December 2004; Los Angeles World Airports, Specific Plan Amendment Study, Final Environmental Impact Report, January 2013.

4.1.6 Impact Analysis

4.1.6.1 Regional Construction Impacts

The worst-case daily emissions were calculated for each phase of construction and for the 122-day runway closure. Criteria and precursor pollutant emissions (CO, VOC, NO_X, SO_X, PM_{10}, and $PM_{2.5}$) for aircraft are presented in **Table 4.1-11**. Based on the difference in taxi times, the peak aircraft operational emissions will occur during the runway closure period, not the shortened runway period. Therefore, only emissions from this phase are shown.

Table 4.1-11

2015 Peak Aircraft Operations Emissions (lbs/day)

Pollutant	Without Project	Runway Closure	Incremental Difference
CO	16,848	17,313	465
VOC	2,767	2,826	59
NO_X	18,794	18,877	83
SO_2	1,805	1,831	25
PM_{10}	258	261	4
$PM_{2.5}$	258	261	4

Source: Ricondo & Associates, Inc., March 2014.

Total construction period emissions (including from construction activity and the shift in aircraft operations), and significance thresholds are presented in **Table 4.1-12** for all pollutants studied. As shown, construction-related daily (short-term) emissions of CO, VOC, and NO_X would exceed SCAQMD significance thresholds. These calculations include appropriate reductions achieved with implementation of mandated dust control, as required by SCAQMD Rule 403 (Fugitive Dust). These calculations also include implementation of measures to reduce emissions from the combustion of fossil fuels. The proposed Project would use equipment that meet stringent emission standards for NO_X, PM_{10}, and $PM_{2.5}$, which would result in substantial emission reductions compared to fleet-wide average emissions for heavy-duty construction equipment and trucks in the southern California region. As discussed in Section 4.1.5, on-road trucks would comply with the USEPA 2007 on-road emissions standards for NO_2 and DPM (primarily $PM_{2.5}$). Compliance with the USEPA 2007 on-road emission standards would result in a reduction of NO_2 and DPM by approximately 40 percent and 22 percent, respectively, compared to fleet-wide average emissions for heavy-duty trucks.[22] Off-road diesel-powered construction equipment greater than 50 horsepower (hp) would meet USEPA Tier 4 off-road

[22] The SCAQMD requested that LAWA consider requiring haul trucks meet the 2010 on-road emission standards for LAWA projects. LAWA has agreed to incorporate that requirement into the Project, if sufficient equipment that meets these standards is available within 120 miles of the Project (see Section 4.1.8). However, because LAWA cannot guarantee that sufficient equipment is available that meets the 2010 on-road emission standards, the analysis was based on meeting the 2007 on-road emission standards.

emissions standards. Compliance with the USEPA Tier 4 off-road emissions standards would result in substantial reduction in emissions of NO_2 and DPM compared to fleet-wide average emissions for heavy-duty construction equipment.

Table 4.1-12

2015 Peak Construction Emissions (lbs/day)

Pollutant	Incremental Aircraft Operations	Construction Equipment	Construction Total	SCAQMD Threshold	Above Threshold?
CO	465	383	848	550	**Yes**
VOC	59	38	97	75	**Yes**
NO_X	83	136	219	100	**Yes**
SO_2	25	1	26	150	No
PM_{10}	4	129	133	150	No
$PM_{2.5}$	4	42	46	55	No

Source: Ricondo & Associates, Inc., March 2014.

4.1.6.2 Localized Construction Impacts

As discussed in Section 4.1.2, *Methodology*, the localized effects from the on-site portion of daily emissions were evaluated at nearby sensitive receptor locations potentially impacted by the proposed Project consistent with the methodologies in the SCAQMD's *Final Localized Significance Threshold Methodology.* The SCAQMD recommends that lead agencies perform project-specific air quality modeling for larger projects.[23] The proposed Project area exceeds five acres in total size; therefore, Project-specific dispersion modeling was used to assess localized construction impacts rather than the mass emission rate look-up tables. The Project-specific air quality modeling of localized construction impacts was performed consistent with the mass emission rate look-up tables in SCAQMD's *Final Localized Significance Threshold Methodology* (June 2008). The results of the LST dispersion modeling are summarized in **Table 4.1-13**.

The air pollutant concentrations shown in Tables 4.1-13 represent the highest concentrations at the fence line of the Airport, as shown in Figure 4.1-1. With the exception of NO_2, all the analyzed air pollutants were found to be below the NAAQS and CAAQS thresholds. 1-hour concentrations of NO_2 were found to exceed the CAAQS thresholds at two of the 327 LAX fence line locations that were evaluated (Figure 4.1-1), due to the shift in runway use for aircraft operations that would occur during the proposed 4-month closure of Runway 6L-24R. However, all NO_2 concentrations were found to be below the 1-hour NAAQS and annual CAAQS thresholds. Therefore, construction concentrations for NO_2 would be significant. Construction concentrations for all other criteria pollutants would be less than significant.

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[23] South Coast Air Quality Management District, Final Localized Significance Threshold Methodology, (2008) 1-5.

Table 4.1-13

Construction Peak Concentrations

Pollutant	Averaging Period	Construction ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total ($\mu g/m^3$)	Threshold ($\mu g/m^3$)	Significant?
CO	1-hr	1,218	4,104	5,322	23,000	No
	1-hr NAAQS	1,218	4,104	5,322	40,000	No
	8-hr	269	2,884	3,154	10,000	No
NO_2	1-hr	214	184	399	339	**Yes**
	1-hr NAAQS	23	122	136	188	No
	Annual	8	26	34	57	No
SO_2	1-hr	98	68	166	655	No
	1-hr NAAQS	61	21	82	196	No
	3-hr	52	39	91	1,300	No
	24-hr	8	16	23	105	No
	Annual NAAQS	2	3	5	80	No
PM_{10}	24-hr	3.7	-	3.7	10.4	No
	Annual	0.5	-	0.5	1.0	No
$PM_{2.5}$	24-hr	1.2	-	1.2	10.4	No

Source: Ricondo & Associates, Inc., March 2014.

4.1.6.3 Odors

Potential sources that may emit odors during construction activities include the use of architectural coatings and solvents and from diesel emissions. SCAQMD Rule 1113 limits the amounts of VOCs from architectural coatings and solvents. The proposed Project would comply with DPM reduction strategies such as compliance with USEPA 2007 on-road emission standards for heavy-duty trucks and USEPA Tier 4 off-road emission standards for heavy-duty construction equipment. Due to mandatory compliance with SCAQMD Rules and compliance with DPM reduction strategies, no construction activities or materials are proposed which would create objectionable odors affecting a substantial number of people. In addition, the nearest sensitive receptors are located beyond the LAX property line and would be further buffered by the dissipation of odors with distance and prevailing winds. Therefore, no significant impact would occur and no mitigation measures would be required.

4.1.7 Cumulative Impacts

The SCAQMD has provided guidance on an acceptable approach to addressing the cumulative impacts issue for air quality.[24] "As Lead Agency, the AQMD uses the same significance thresholds for project specific and cumulative impacts for all environmental topics analyzed in an Environmental Assessment or EIR… Projects that exceed the project-specific significance

24 South Coast Air Quality Management District, "White Paper on Potential Control Strategies to Address Cumulative Impacts from Air Pollution," August 2003. Available at: http://www.aqmd.gov/rules/ciwg/final_white_paper.pdf.

thresholds are considered by the SCAQMD to be cumulatively considerable. This is the reason project-specific and cumulative significance thresholds are the same. Conversely, projects that do not exceed the project-specific thresholds are generally not considered to be cumulatively significant."

As shown in Table 4.1-12, construction of the proposed Project would exceed the Project-specific significance thresholds for regional emissions of CO, VOC, and NO_X. As shown in Table 4.1-13, construction of the proposed Project would exceed the Project-specific significance thresholds for localized emissions of NO_2. As a result, the proposed Project would have a cumulatively considerable contribution for construction emissions and would result in a cumulatively significant construction impact.

For disclosure purposes, a list of past, present, and probable future LAWA projects that could overlap in time for construction are provided in **Table 4.1-14** along with estimated mass emissions. Emissions for several of these related LAWA projects were estimated or obtained from publicly available and readily accessible environmental documents. Construction emissions for other projects were estimated based on the ratio of the project costs as compared to the proposed Project. Calculation details are provided in Appendix B.

4.1.8 Mitigation Measures

LAWA is committed to mitigating temporary construction-related emissions to the extent practicable and has established some of the most aggressive construction emissions reduction measures in southern California, particularly with regard to requiring construction equipment to be equipped with emissions control devices. The specific means for implementing the mitigation measures described in Section 4.1.5 were first approved and implemented as part of the SAIP and would also be applied to the proposed Project. Mitigation measures described in Section 4.1.5 also include those required by the Community Benefits Agreement. These mitigation measures establish a commitment and process for incorporating all technically feasible air quality mitigation measures into each component of the LAX Master Plan, as well as LAX projects that are independent of the LAX Master Plan. In addition, the Los Angeles Green Building Code Tier 1 standards, which are applicable to all projects with a Los Angeles Department of Building and Safety permit-valuation over $200,000, require the proposed Project to implement a number of measures that would reduce criteria pollutant and greenhouse gas emissions. These include measures such as: further reduce vehicle and equipment idling times; comply with Tier 4 emission standards for non-road diesel equipment; retrofit existing diesel equipment with particulate filters and oxidation catalysts; replace aging equipment with new low-emission models; and consider the use of alternative fuels for construction equipment.

The SCAQMD has previously noted that Tier 4-final construction equipment was assumed for the majority of vehicles used on LAWA construction projects; however some vehicles were assumed to only use Tier 4-interim engines. The SCAQMD requested that LAWA investigate if additional Tier 4-final equipment is available. In addition, the SCAQMD noted that haul trucks were assumed to meet 2007 emission standards, but that 2010 truck emission standards would provide additional NO_x emission reductions. SCAQMD has requested that LAWA consider only using trucks meeting 2010 emissions standards.

Table 4.1-14

Cumulative Construction Projects Peak Daily Emissions Estimates (tons/quarter)

Related LAWA Project During Construction	Peak Potentially Overlapping Daily Emissions					
	CO	**VOC**	**NO_X**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
N/A Runway 6L-24R and Runway 6R-24R Runway Safety Area and Associated Improvements [1]	29.6	3.5	6.7	1.2	2.5	0.9
1. Runway Safety Area Improvements – South Airfield	--- [2]	--- [2]	--- [2]	--- [2]	--- [2]	--- [2]
2. LAX Bradley West Project – Remaining Work	6.4	1.1	8.1	<1	2.0	0.7
3. Terminal 3 Connector	--- [2]	--- [2]	--- [2]	--- [2]	--- [2]	--- [2]
4. North Terminals Improvements	0.3	0.1	0.4	<1	0.1	0.0
5. South Terminals Improvements	0.6	0.3	0.8	<1	0.1	0.1
6. Midfield Satellite Concourse – North	20.1	1.9	3.8	<1	3.6	0.7
7. Central Utility Plant Replacement – Remaining Work	--- [2]	--- [2]	--- [2]	--- [2]	--- [2]	--- [2]
8. Miscellaneous Projects and Improvements	23.9	6.4	32.3	<1	4.2	1.7
9. West Aircraft Maintenance Area Project	1.7	0.3	0.9	<1	0.1	0.1
10. LAX Northside Area Development	7.8	1.3	2.5	<1	0.9	0.3
11. LAX Master Plan Alt. D/SPAS Development [3]	61.7	12.2	157.2	<1	64.5	10.2
12. Metro Crenshaw / LAX Transit Corridor and Station	--- [2]	--- [2]	--- [2]	--- [2]	--- [2]	--- [2]
Total From Other Construction Projects Emissions	122.4	23.5	206.1	<1	75.4	13.7
Total Cumulative Construction Project Emissions	**152.0**	**27.0**	**212.8**	**<2**	**77.9**	**14.6**
SCAQMD Construction Emission Significance Thresholds[4]	25.09	3.42	4.56	6.84	6.84	2.51
Emissions Exceed SCAQMD Project-Level Threshold?	Yes	Yes	Yes	No	Yes	Yes

Notes:

1 Project construction is estimated to occur entirely in 2015.

2 Project is not anticipated to result in overlapping construction emissions during the estimated combined peak quarter (Q3).

3 Improvements contemplated under this Project still require a number of federal and local approvals, including completion of environmental review documents and processes, and are several years away from implementation. For the purposes of this cumulative impacts analysis, conservative assumptions were made relative to construction of such improvements beginning early enough to overlap construction of the proposed Project.

4 The SCAQMD daily construction emission significance thresholds were converted to tons per quarter by multiplying the daily threshold by 365 days, dividing by 4, and applying the conversion rate of 2,000 pounds per ton.

Sources: CDM Smith (list and characteristics of proposed Project and concurrent projects), August 2013; Crenshaw/LAX Transit Corridor Project FEIR (Metro Crenshaw/LAX Transit Corridor cost), August 2011, Available at: www.metro.net/projects/crenshaw_corridor.com (Metro Crenshaw/LAX Transit Corridor schedule), Accessed November 12, 2012; Ricondo & Associates, Inc., March 2014.

LAWA will include in bid documents for the proposed Project language specifying that contractors should use equipment on the Project that meets the most stringent emission requirements. In the event that the contractor can demonstrate that equipment is not available within 120 miles of LAX that meets the most stringent emission requirements, they will be able to utilize equipment that meets the next lowest requirements (e.g., if Tier 4 final equipment is not available, they would be permitted to use Tier 4 interim equipment). Because it is difficult for LAWA to determine whether equipment is available that meet the most stringent emission requirements, for purposes of this analysis, LAWA has kept the equipment mix specified in the Draft EIR, but will require contractors to use equipment that meets stricter standards if available.

Specifically, LAWA will modify the following construction-related air quality control measures (LAX-AQ-2):

- Measure 2n: On-road trucks used on LAX construction projects with a gross vehicle weight rating of at least 19,500 pounds shall, at a minimum, comply with USEPA 2010 on-road emissions standards for PM_{10} and NO_x. Contractor requirements to utilize such on-road haul trucks or the next cleanest vehicle available will be subject to the provisions of LAWA Air Quality Control Measure 2p below.
- Measure 2o: Prior to January 1, 2015, all off-road diesel-powered construction equipment greater than 50 horsepower shall meet, at a minimum, USEPA Tier 3 off-road emission standards. After December 31, 2014, all off-road diesel-power construction equipment greater than 50 horsepower shall meet USEPA Tier 4(final) off-road emissions standards. Tier 4(final) equipment shall be considered based on availability at the time the construction bid is issued. Contractor requirements to utilize Tier 4(final) equipment or next cleanest equipment available will be subject to the provisions of LAWA Air Quality Control Measure 2p below. LAWA will encourage construction contractors to apply for SCAQMD "SOON" funds to accelerate clean-up of off-road diesel engine emissions.
- Measure 2p: The on-road haul truck and off-road construction equipment requirements set forth in Air Quality Control Measures 2n and 2o above shall apply unless any of the following circumstances exist and the Contractor provides a written finding consistent with project contract requirements that:
    - The Contractor does not have the required types of on-road haul trucks or off-road construction equipment within its current available inventory and intends to meet the requirements of the Measures 2n and 2o as to a particular vehicle or piece of equipment by leasing or short-term rental, and the Contractor has attempted in good faith and due diligence to lease the vehicle or equipment that would comply with these measures, but that vehicle or equipment is not available for lease or short-term rental within 120 miles of the project site, and the Contractor has submitted documentation to LAWA showing that the requirements of this exception provision (Measure 2p) apply.
    - The Contractor has been awarded funding by SCAQMD or another agency that would provide some or all of the cost to retrofit, repower, or purchase a piece of equipment or vehicle, but the funding has not yet been provided due to circumstances beyond the Contractor's control, and the Contractor has attempted in good faith and due diligence to lease or short-term rent the equipment or

vehicle that would comply with Measures 2n and 2o, but that equipment or vehicle is not available for lease or short-term rental within 120 miles of the project site, and the Contractor has submitted documentation to LAWA showing that the requirements of this exception provision (Measure 2p) apply.

- o Contractor has ordered a piece of equipment or vehicle to be used on the construction project in compliance with Measures 2n and 2o at least 60 days before that equipment or vehicle is needed at the project site, but that equipment or vehicle has not yet arrived due to circumstances beyond the Contractor's control, and the Contractor has attempted in good faith and due diligence to lease or short-term rent a piece of equipment or vehicle to meet the requirements of Measures 2n and 2o, but that equipment or vehicle is not available for lease or short-term rental within 120 miles of the project, and the Contractor has submitted documentation to LAWA showing that the requirements of this exception provision (Measure 2p) apply.
- o Construction-related diesel equipment or vehicle will be used on the project site for fewer than 20 calendar days per calendar year. The Contractor shall not consecutively use different equipment or vehicles that perform the same or a substantially similar function in an attempt to use this exception (Measure 2p) to circumvent the intent of Measures 2n and 2o.

In any of the situations described above, the Contractor shall provide the next cleanest piece of equipment or vehicle as provided by the step down schedules in **Table 4.1-15** for Off-Road Equipment and **Table 4.1-16** for On-Road Equipment.

Table 4.1-15

Off-Road Vehicle Compliance Step-Down Schedule

Compliance Alternative	Engine Standard	CARB-verified DECS (VDECS)
1	Tier 4 *interim*	N/A*
2	Tier 3	Level 3
3	Tier 2	Level 3
4	Tier 1	Level 3
5	Tier 2	Level 2
6	Tier 2	Level 1
7	Tier 2	Uncontrolled
8	Tier 1	Level 2

Notes:
Equipment less than Tier 1, Level 2 shall not be permitted.
* Tier 4 (interim or final) or 2007 model year equipment not already supplied with a factory-equipped diesel particulate filter shall be outfitted with Level 3 VDECS.

Source: CDM Smith, January 2014.

Table 4.1-16

On-Road Vehicle Compliance Step-Down Schedule

Compliance Alternative	Engine Model Year	CARB-verified DECS (VDECS)
1	2007	N/A*
2	2004	Level 3
3	1998	Level 3
4	2004	Uncontrolled
5	1998	Uncontrolled

Notes:
Equipment with a model year earlier than model year 1998 shall not be permitted.
* Tier 4 (interim or final) or 2007 model year equipment not already supplied with a factory-equipped diesel particulate filter shall be outfitted with Level 3 VDECS.
Nothing in the above measures shall require an emissions control device (i.e., VDECS) that does not meet OSHA standards.

Source: CDM Smith, January 2014.

As stated above, LAWA is committed to mitigating temporary construction-related emissions to the extent practicable and will implement the mitigation measures specified in Section 4.1.5 and those discussed above. Although these measures would not mitigate impacts to a level that is less than significant, they would reduce impacts associated with the proposed Project to the extent feasible.

4.1.9 Level of Significance After Mitigation

Even with incorporation of feasible construction-related mitigation measures as described above, the maximum peak daily construction-related regional mass emissions resulting from the proposed Project would be significant for CO, VOC, and NO_X, as shown by the emissions inventory. Dispersion modeling demonstrates that the proposed Project construction-related airborne concentrations would exceed the 1-hr NO_2 CAAQS threshold, but would remain below the ambient air quality standards for all other pollutants. There are no additional feasible Project-specific mitigation measures that would reduce the temporary construction-related impacts below significance thresholds. Therefore, the proposed Project would result in significant and unavoidable construction-related air quality impacts and would also result in cumulatively considerable significant and unavoidable construction-related air quality impacts.

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