4.2 AIR QUALITY

This section evaluates the potential for the General Aviation Improvement Program ("GAIP") to have adverse effects as a result of air quality emissions. Information in this section is predominately based on *Air Quality Technical Report* prepared by Landrum & Brown and included in this Program EIR as Appendix E (Landrum & Brown 2018). Additional information from regional planning programs and other sources has also been incorporated into this section.

4.2.1 BACKGROUND

Air Pollutants

Criteria Air Pollutants

Air quality, in part, is defined by ambient air concentrations of seven "criteria air pollutants", which are a group of common air pollutants identified by the U.S. Environmental Protection Agency ("USEPA") to be of concern with respect to the health and welfare of the general public. Federal and State governments regulate such pollutants by adopting acceptable ambient air quality standards that are based on criteria regarding the health and/or environmental effects of each pollutant. The seven regulated pollutants include nitrogen dioxide ("NO_2"); ozone ("O_3"); particulate matter, including both particles equal to or smaller than 10 microns ("PM10") and particles equal to or smaller than 2.5 microns ("PM2.5");[1] carbon monoxide ("CO"); sulfur dioxide ("SO_2"); and lead. A description of each criteria air pollutant, including source types and health effects, is provided below.

Nitrogen Dioxide

Nitrogen gas, normally relatively inert (i.e., nonreactive), comprises about 80 percent of the air. At high temperatures (e.g., in combustion processes used to operate motor vehicles) and under certain other conditions, nitrogen can combine with oxygen to form several different gaseous compounds collectively called nitrogen oxides ("NOx"). Nitric oxide ("NO"), NO_2, and nitrous oxide ("N_2O") are important constituents of NOx. NO and NO_2 are both precursors in the formation of O_3 and PM2.5, as discussed below. Because of this and the fact that NO emissions largely convert to NO_2, NOx emissions are typically examined when assessing potential air quality impacts.

NO_2 is a red-brown pungent gas and is toxic to various animals and to humans because of its ability to form nitric acid with water in the eyes, lungs, mucus membranes, and skin. In animals, long-term exposure to NOx increases susceptibility to respiratory infections, lowering resistance to such diseases as pneumonia and influenza. Laboratory studies show that susceptible humans, such as asthmatics, who are exposed to high concentrations of NO_2 can suffer lung irritation and, potentially, lung damage. Epidemiological studies have also shown associations between NO_2 concentrations and daily mortality from respiratory and cardiovascular causes, and with hospital admissions for respiratory conditions.

[1] Particulate matter size refers to the aerodynamic diameter of the particle.

Ozone

Ozone is a secondary pollutant, meaning that it is not directly emitted. It is a gas that is formed when volatile organic compounds ("VOCs") (also referred to as reactive organic gases) and NOx undergo photochemical reactions that occur only in the presence of sunlight. The primary source of VOC emissions is unburned hydrocarbons in motor vehicle and other internal combustion engine exhaust. NOx also forms as a result of the combustion process, most notably due to the operation of motor vehicles. Sunlight and hot weather cause ground-level O_3 to form; as a result, ozone is known as a summertime air pollutant. (Ground-level O_3 is not to be confused with atmospheric O_3 or the "ozone layer", which occurs very high in the atmosphere and shields the planet from some ultraviolet rays.) Ground-level O_3 is the primary constituent of smog. Because O_3 formation occurs over extended periods of time, both O_3 and its precursors are transported by wind, and high O_3 concentrations can occur in areas well away from sources of its constituent pollutants.

People with lung disease, children, older adults, and people who are active can be affected when ozone levels exceed ambient air quality standards. Numerous scientific studies have linked ground-level ozone exposure to a variety of problems, including:

- lung irritation that can cause inflammation much like a sunburn;
- wheezing, coughing, pain when taking a deep breath, and breathing difficulties during exercise or outdoor activities;
- permanent lung damage to those with repeated exposure to ozone pollution; and
- aggravated asthma, reduced lung capacity, and increased susceptibility to respiratory illnesses like pneumonia and bronchitis.

Particulate Matter

Particulate matter includes both aerosols and solid particles of a wide range of size and composition. Of particular concern are PM10 and PM2.5. Particulate matter tends to occur primarily in the form of fugitive dust. This dust appears to be generated by both local sources and by region-wide dust during moderate to high wind episodes. These regional episodes tend to be multi-district and sometimes interstate in scope. The principal sources of dust in urban areas are from grading, construction, disturbed areas of soil, and dust entrained by vehicles on roadways.

PM10 is generally emitted directly as a result of mechanical processes that crush or grind larger particles or from the re-suspension of dusts, most typically through construction activities and vehicular travels. PM10 generally settles out of the atmosphere rapidly and is not readily transported over large distances.

PM2.5 is directly emitted in combustion exhaust and is formed in atmospheric reactions between various gaseous pollutants including NOx, sulfur oxides ("SOx"), and VOCs. PM2.5 can remain suspended in the atmosphere for days and/or weeks and can be transported long distances.

The principal health effects of airborne particulate matter are on the respiratory system. Short-term exposure to high PM2.5 and PM10 levels is associated with premature mortality and

increased hospital admissions and emergency room visits; increased respiratory symptoms are also associated with short-term exposure to high PM10 levels. Long-term exposure to high PM2.5 levels is associated with premature mortality and development of chronic respiratory disease. According to the USEPA, some people are much more sensitive than others to breathing PM10 and PM2.5. People with influenza, chronic respiratory and cardiovascular diseases, and the elderly may suffer worse illnesses; people with bronchitis can expect aggravated symptoms; and children may experience decline in lung function due to breathing in PM10 and PM2.5. Other groups considered sensitive include smokers and people who cannot breathe well through their noses. Exercising athletes are also considered sensitive because many breathe through their mouths.

Carbon Monoxide

Carbon monoxide is a colorless and odorless gas which, in the urban environment, is associated primarily with the incomplete combustion of fossil fuels in motor vehicles. CO combines with hemoglobin in the bloodstream and reduces the amount of oxygen that can be circulated through the body. High CO concentrations can cause headaches; aggravate cardiovascular disease; and impair central nervous system functions.

CO concentrations can vary greatly over comparatively short distances. Relatively high concentrations are typically found near crowded intersections; along heavily used roadways carrying slow-moving traffic; and at or near ground level. Even under the most severe meteorological and traffic conditions, high concentrations of CO are limited to locations within a relatively short distance (i.e., up to 600 feet or 185 meters) of heavily traveled roadways.

Sulfur Dioxide

SOx constitute a class of compounds of which SO_2 and sulfur trioxide ("SO_3") are of greatest importance. Ninety-five percent of pollution-related SOx emissions are in the form of SO_2. SOx emissions are typically examined when assessing potential air quality impacts of SO_2. The primary contributor of SOx emissions is fossil fuel combustion for generating electric power. Industrial processes, such as nonferrous metal smelting, also contribute to SOx emissions. SOx is also formed during combustion of motor fuels; however, most of the sulfur has been removed from fuels, greatly reducing SOx emissions from vehicles.

SO_2 combines easily with water vapor, forming aerosols of sulfurous acid ("H_2SO_3"), a colorless, mildly corrosive liquid. This liquid may then combine with oxygen in the air, forming the even more irritating and corrosive sulfuric acid ("H_2SO_4"). Peak levels of SO_2 in the air can cause temporary breathing difficulty for people with asthma who are active outdoors. Longer-term exposures to high levels of SO_2 gas and particles cause respiratory illness and aggravate existing heart disease. SO_2 reacts with other chemicals in the air to form tiny sulfate particles which are measured as PM2.5.

Lead

Lead is a stable compound, which persists and accumulates both in the environment and in animals. In humans, it affects the body's blood-forming (or hematopoietic), nervous, and renal systems. In addition, lead has been shown to affect the normal functions of the reproductive, endocrine, hepatic, cardiovascular, immunological and gastrointestinal systems, although there

is significant individual variability in response to lead exposure. In general, an emissions analysis of lead is limited to projects that emit significant quantities of the pollutant (i.e., lead smelters) and not required for transportation projects.

Toxic Air Contaminants/Hazardous Air Pollutants/Chemicals of Potential Concern

Toxic air contaminants ("TACs") are a diverse group of air pollutants that may cause or contribute to an increase in deaths or in serious illness, or that may pose a present or potential hazard to human health. TACs may be emitted from a variety of common sources, including motor vehicles, gasoline stations, dry cleaners, industrial operations, painting operations, and research and teaching facilities.

TACs are different than the criteria air pollutants previously discussed in that ambient air quality standards have not been established for them. Rather, TAC impacts are described by reference to carcinogenic (i.e., cancer) risk and chronic (i.e., of long duration) and acute (i.e., severe but of short duration) adverse effects on human health. Diesel particulate matter ("Diesel PM") is a TAC and is responsible for the majority of California's known cancer risk from outdoor air pollutants. The USEPA uses the term "hazardous air pollutants" ("HAP") for TACs.

4.2.2 REGULATORY SETTING

The John Wayne Airport site is located in the South Coast Air Basin ("SoCAB"). The SoCAB is comprised of all of Orange County and parts of San Bernardino, Los Angeles, and Riverside counties. The USEPA, the California Air Resources Board ("CARB"), and the South Coast Air Quality Management District ("SCAQMD") regulate air quality in the SoCAB. Each of these agencies develops rules, regulations, policies, and/or goals to comply with applicable legislation. The Southern California Association of Governments ("SCAG") is an important partner to the SCAQMD and produces estimates of anticipated future growth and vehicular travel in the SoCAB that are used for air quality planning. The federal, State, regional, and local regulations for criteria air pollutants and TACs are discussed below.

Federal

National Ambient Air Quality Standards

The Federal Clean Air Act ("CAA") requires the adoption of National Ambient Air Quality Standards ("NAAQS"), which are periodically updated to protect the public health and welfare from the effects of air pollution. The USEPA is responsible for setting and enforcing the NAAQS for criteria pollutants. Primary standards set limits to protect public health, including the health of at-risk populations such as people with pre-existing heart or lung disease (such as asthmatics), children, and older adults. Secondary standards set limits to protect public welfare, including protection against visibility impairment as well as damage to animals, crops, vegetation, and buildings. Current federal standards are set for SO_2, CO, NO_2, 0_3, PM10, PM2.5, and lead. NAAQS are shown in Table 4.2-1.

TABLE 4.2-1
CALIFORNIA AND NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards[a]	Federal Standards	
			Primary[b]	Secondary[c]
O_3[c]	1 Hour	0.09 ppm (180 µg/m³)	–	–
	8 Hour	0.070 ppm (137 µg/m³)	0.070 ppm (137 µg/m³)	Same as Primary
PM10	24 Hour	50 µg/m³	150 µg/m³	Same as Primary
	AAM	20 µg/m³	–	Same as Primary
PM2.5	24 Hour	–	35 µg/m³	Same as Primary
	AAM	12 µg/m³	12.0 µg/m³	15.0 µg/m³
CO	1 Hour	20 ppm (23 mg/m³)	35 ppm (40 mg/m³)	–
	8 Hour	9.0 ppm (10 mg/m³)	9 ppm (10 mg/m³)	–
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m³)	–	–
NO_2	AAM	0.030 ppm (57 µg/m³)	0.053 ppm (100 µg/m³)	Same as Primary
	1 Hour	0.18 ppm (339 µg/m³)	0.100 ppm (188 µg/m³)	–
SO_2	24 Hour	0.04 ppm (105 µg/m³)	–	–
	3 Hour	–	–	0.5 ppm (1,300 µg/m³)
	1 Hour	0.25 ppm (655 µg/m³)	0.075 ppm (196 µg/m³)	–
Lead	30-day Avg.	1.5 µg/m³	–	–
	Calendar Quarter	–	1.5 µg/m³	Same as Primary
	Rolling 3-month Avg.	–	0.15 µg/m³	
Visibility Reducing Particles	8 hour	Extinction coefficient of 0.23 per km – visibility ≥ 10 miles (0.07 per km – ≥30 miles for Lake Tahoe)	**No Federal Standards**	
Sulfates	24 Hour	25 µg/m³		
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m³)		
Vinyl Chloride	24 Hour	0.01 ppm (26 µg/m³)		

O_3: ozone, ppm: parts per million, µg/m³: micrograms per cubic meter, –: No Standard; PM10: respirable particulate matter with a diameter of 10 microns or less, AAM: Annual Arithmetic Mean, PM2.5: fine particulate matter with a diameter of 2.5 microns or less, CO: carbon monoxide, mg/m³: milligrams per cubic meter, NO_2: nitrogen dioxide, SO_2: sulfur dioxide, km: kilometer.

[a] *California Air Quality Standards:* California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM10, PM2.5, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded

[b] *National Primary Standards:* The levels of air quality necessary, within an adequate margin of safety, to protect the public health.

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

Note: More detailed information in the data presented in this table can be found at the CARB website (http://www.arb.ca.gov/research/aaqs/aaqs2.pdf).

Source: CARB 2016a.

Specific geographic areas are classified as either "attainment" or "nonattainment" areas for each pollutant based upon the comparison of measured data with the NAAQS. "Attainment" areas have concentrations of the criteria pollutant that are below the NAAQS, and a "nonattainment" classification indicates the criteria pollutant concentrations have exceeded the NAAQS. When an area has been reclassified from a nonattainment to an attainment area for a federal standard, the status is identified as "maintenance", and there must be a plan and measures that will keep the region in attainment for the following ten years. Areas designated as "nonattainment" are required to prepare regional air quality plans, which set forth a strategy for bringing an area into compliance with the standards. These regional air quality plans, which are developed to meet federal requirements, are included in an overall program referred to as the State Implementation Plan ("SIP"). Orange County's NAAQS attainment status is described in Table 4.2-2, in which non-attainment status is emphasized with bold font.

TABLE 4.2-2
ATTAINMENT STATUS OF CRITERIA POLLUTANTS
IN THE SOUTH COAST AIR BASIN

Pollutant	Averaging Period	Orange County Attainment Status	
		California Standard	Federal Standard
O_3	1 hour	**Non-Attainment**	–
	8 hour	**Non-Attainment**	**Extreme Non-Attainment**
PM_{10}	24 hour	**Non-Attainment**	Attainment (Maintenance)
	Annual	**Non-Attainment**	–
$PM_{2.5}$	24 hour	-	-
	Annual	**Non-Attainment**	**Moderate Non-Attainment**
CO	1 hour	Attainment	Attainment (Maintenance)
	8 hour	Attainment	Attainment (Maintenance)
NO_2	1 hour	Attainment	Attainment (Maintenance)
	Annual	Attainment	Attainment (Maintenance)
Lead	30 day average	Attainment	–
	Rolling 3-month average	–	Attainment/Non Attainment[a]
SO_2	1 hour	Attainment	Attainment
	3 hour	–	Attainment
	24 hour	Attainment	–
H_2S	1 hour	Unclassified	–
Vinyl Chloride	24 hour	Unclassified	–
Sulfates	24 hour	Attainment	–
Visibility-Reducing Particles	8 hour	Unclassified	–

O_3: ozone; PM10: particulate matter 10 microns or less in diameter; PM2.5: particulate matter 2.5 microns or less in diameter; CO: carbon monoxide; NO_2: nitrogen dioxide; SO_2: sulfur dioxide; H2S: Hydrogen sulfide.

[a] Only the Los Angeles County portion of the SoCAB is designated nonattainment for lead; the remainder of the SoCAB, including the County of Orange, is designated attainment.

Source: Landrum & Brown, 2018 (Appendix E)

Aircraft Emissions

In addition to its authority to adopt, amend, and enforce the NAAQS, Section 233 of the CAA exclusively vests the authority to promulgate emission standards for aircraft or aircraft engines with the USEPA. States and other municipalities are preempted from adopting or enforcing any standard respecting aircraft engine emissions unless such standard is identical to USEPA's standards.

To date, the USEPA has adopted NOx emission standards for aircraft gas turbine engines with rated thrusts greater than 26.7 kilonewtons. (These types of engines are used primarily on commercial passenger and freight aircraft.) The requirements were previously adopted by the International Civil Aviation Organization ("ICAO"). Included in the rule are two new tiers of more stringent emission standards for NOx. These are referred to as Tier 6 standards and Tier 8 standards. The Tier 6 standards became effective for newly manufactured aircraft engines beginning in 2013. Engine models that were originally certificated beginning on or after January 1, 2014, must comply with the Tier 8 standards. (77 Fed.Reg. 36342-36386.) In addition, the USEPA has aircraft exhaust standards for NOx, hydrocarbons ("HC"), CO, and smoke.

State

California Air Resources Board

In response to its responsibilities under the California Clean Air Act ("CCAA"), CARB has established the California Ambient Air Quality Standards ("CAAQS") shown in Table 4.2-1, which are generally more restrictive than the NAAQS. Orange County's CAAQS attainment status is described in Table 4.2-2, in which non-attainment status is emphasized with bold font.

CARB also conducts research; compiles emissions inventories; develops suggested control measures; provides oversight of local programs; and prepares the SIP. For regions that do not attain the CAAQS, CARB requires the air districts to prepare plans for attaining the standards. CARB establishes emissions standards for motor vehicles sold in California, consumer products (*e.g.*, hair spray, aerosol paints, and barbecue lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions.

CARB's statewide comprehensive air toxics program was established in the early 1980s in response to related legislation. Specifically, the TAC Identification and Control Act (AB 1807, Tanner 1983) created California's program to reduce exposure to air toxics. The Air Toxics "Hot Spots" Information and Assessment Act (AB 2588, Connelly 1987) supplements the AB 1807 program by requiring a statewide air toxics inventory, notification of people exposed to a significant health risk, and facility plans to reduce these risks.

Under AB 1807, CARB is required to use certain criteria in the prioritization for the identification and control of air toxics. In selecting substances for review, CARB must consider criteria relating to "the risk of harm to public health, amount or potential amount of emissions, manner of, and exposure to, usage of the substance in California, persistence in the atmosphere, and ambient concentrations in the community." AB 1807 also requires CARB to use available information gathered from the AB 2588 program in the prioritization of compounds. In September 1992, the

Hot Spots Act was amended by Senate Bill 1731, which required facilities that pose a significant health risk to reduce their risk through a risk management plan.

To address the management of risks associated with diesel PM, CARB adopted the *Diesel Risk Reduction Plan* in September 2000 (ARB 2000). The Plan recommended a number of emission control measures to reduce the risks associated with diesel PM and achieve the goal of a 75-percent reduction in diesel PM levels by 2010 and an 85-percent reduction by 2020 from the 2000 levels. Emission control measures and programs are aimed at reducing diesel PM emissions produced within the State of California from on-road engines, off-road engines, portable engines, stationary sources, and more generally from large sources of diesel PM emissions such as marine ports and rail yards.

Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling

The California Code of Regulations ("CCR", specifically, Title 13, Section 2485) places restrictions on vehicular idling. It requires that, on or after February 1, 2005, any person that owns, operates, or causes to operate any diesel-fueled commercial motor vehicle with gross vehicular weight ratings of greater than 10,000 pounds must prohibit vehicle idling for more than five consecutive minutes at any location. Additionally, diesel-fueled internal combustion engine auxiliary power systems ("APS") must be prohibited from operating for greater than 5 minutes at any location when within 100 feet of any property zoned for individual or multi-family housing units, schools, hotels, motels, hospitals, senior care facilities or child care facilities.

Regional

South Coast Air Quality Management District

Air quality management districts are the air pollution control agencies that are responsible for attaining and maintaining State and federal ambient air quality standards in their respective air basin(s). California has been divided into 15 air basins based on similar meteorological and topographical features; these basins are managed by 35 different air quality management districts. As discussed above, each air district maintains a plan, or plans, that detail how State and federal air quality standards shall be met for nonattainment pollutants. Additionally, each air district monitors the air quality in its jurisdiction; issues and enforces permits for sources of pollutants to be constructed and operated; and establishes rules and regulations that govern sources of pollutants.

The Airport lies within the district boundaries of the SCAQMD. The SCAQMD was established in 1977 by merging the individual air pollution control districts of the four counties within the SoCAB: Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties.

As discussed above, the Federal CAA requires the preparation of plans to demonstrate attainment of the NAAQS for which an area is designated as being in nonattainment. Furthermore, the CCAA requires the revision of these plans every three years to address reducing pollutant concentrations that exceed the CAAQS. The SCAQMD and SCAG, in coordination with local governments and the private sector, develop the Air Quality Management

Plan ("AQMP") for the SoCAB to satisfy these requirements. The AQMP is the most important air management document for the SoCAB because it provides the blueprint for meeting State and federal ambient air quality standards.

On November 28, 2007, CARB submitted a State Implementation Plan ("SIP") revision to the USEPA for O_3, PM2.5 (1997 Standard), CO, and NO_2 in the SoCAB. This revision is identified as the "2007 South Coast SIP". The 2007 South Coast SIP demonstrates attainment of the federal PM2.5 standard in the SoCAB by 2014 and attainment of the federal 8-hour O_3 standard by 2023. This SIP also includes a request to reclassify the O_3 attainment designation from "severe" to "extreme". The USEPA approved the redesignation effective June 4, 2010. The "extreme" designation requires the attainment of the 8-hour O_3 standard in the SoCAB by June 2024. CARB approved PM2.5 SIP revisions in April 2011 and the O_3 SIP revisions in July 2011. The USEPA approved the PM2.5 SIP revisions on September 25, 2013, and has approved 47 of the 62 1997 8-hour O_3 SIP revisions (USEPA 2016b). Based on the 2011 through 2013 monitoring period, the USEPA determined the SoCAB attained the 1997 annual and 24-hour fine particle ($PM_{2.5}$) NAAQS at all monitoring sites. The ruling became effective on August 24, 2016 (USEPA 2018a).

On September 30, 2015, the USEPA proposed to approve elements of the South Coast 2012 PM2.5 Plan and 2015 Supplement, which addresses Clean Air Act requirements for the 2006 PM2.5 NAAQS, and proposed to reclassify the area as a 'serious' nonattainment area for the 2006 PM2.5 standard. The reclassification is based on the determination that the area cannot practicably attain the 2006 PM2.5 NAAQS by the moderate area attainment date (December 31, 2015). On December 22, 2015, the USEPA reclassified the South Coast area as a "Serious" nonattainment area for the 2006 PM2.5 standard. The final reclassification requires the State to submit a "serious area" plan that provides for attainment of the 2006 PM2.5 NAAQS as expeditiously as practicable as and no later than December 31, 2019 (USEPA 2018b).

The 2016 AQMP was adopted on March 3, 2017 by the SCAQMD Governing Board, which was further approved by the USEPA as the SIP for the air quality basin in October 2017. The 2016 AQMP evaluates integrated strategies and measures to meet the following NAAQS (SCAQMD 2017a):

- 8-hour O_3 (75 parts per billion [ppb]) by 2032[2]
- Annual PM2.5 (12 micrograms per cubic meter [$\mu g/m^3$]) from 2021 to 2025
- 8-hour O_3 (80 ppb) by 2024
- 1-hour O_3 (120 ppb) by 2023
- 24-hour PM2.5 (35 $\mu g/m^3$) by 2019

The 2016 AQMP is built on extensive consultation between CARB and SCAQMD regarding the reduction of emissions from mobile sources. However, the 2016 AQMP recognizes that some sources – referred to as "federally controlled sources" in the AQMP – are under the jurisdiction of the USEPA; the 2016 AQMP explicitly recognizes aircraft as a federally controlled source (see, e.g.,

[2] On October 1, 2015, the USEPA lowered the 8-hour O3 standard to 0.070 ppm (70 ppb). The SIP (or AQMP) for the 70 ppb standard will be due 4 years after the attainment/nonattainment designations are issued by the USEPA. On March 1, 2018 USEPA published their intent to publish a proposed Rule, which would be effective 60 days after publishing in the Federal Register (USEPA 2018c). Thus, meeting the 70 ppb standard will be addressed in a future AQMP.

2016 AQMP, Table 4-22). The 2016 AQMP provides policies and measures to guide SCAB towards attainment of the NAAQS and CAAQS, setting forth a comprehensive strategy aimed at controlling pollution from all sources, including stationary sources, on-road and off-road mobile sources, and area sources. Because the SCAQMD does not have jurisdictional authority over all emission sources in the SoCAB, the 2016 AQMP identifies other agencies (see, e.g., 2016 AQMP, Table 4-22) that are responsible for assisting with implementation of the AQMP's control measures (Landrum & Brown 2018).

Southern California Association of Governments

SCAG is a council of governments for Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura Counties. As a regional planning agency, SCAG serves as a forum for regional issues relating to transportation, the economy, community development, and the environment.

Although SCAG is not an air quality management agency, it is responsible for several air quality planning issues. Specifically, as the designated Metropolitan Planning Organization ("MPO") for the Southern California region, SCAG partners with local air districts by providing information and/or oversight of air quality planning documentation. Specifically, SCAG provides demographic projections as well as integrated land use, housing, employment and transportation programs, measures, and strategies for portions of the South Coast AQMP, which applies to Airport. The local air districts develop and enforce regulations for non-vehicular sources of air pollution and coordinate with SCAG to develop and implement Transportation Control Measures ("TCMs") to reduce and otherwise improve vehicular travel and associated pollutant emissions.

On April 7, 2016, the SCAG Regional Council adopted the 2016–2040 Regional Transportation Plan/Sustainable Communities Strategy ("RTP/SCS"). The RTP/SCS combines the need for mobility with a "sustainable future" through a reduction in the amount of emissions produced from transportation sources.

4.2.3 METHODOLOGY

Construction emissions were calculated using the California Emissions Estimator Model ("CalEEMod", Version 2016.3.2). CalEEMod is a computer program accepted by the SCAQMD that can be used to estimate criteria pollutant and GHG emissions associated with land development projects in California. CalEEMod has separate databases for specific counties and air districts. The Orange County database was used for the proposed Project. CalEEMod defaults were used for equipment and trip generation data.

The CalEEMod model calculates total emissions resulting from each construction activity. The phasing and duration of the construction of each of the improvements were developed by AECOM, in conjunction with Airport staff, and provided by the Airport for the purpose of this analysis. The construction phasing plans are provided in Section 3 (Proposed Project is shown in Exhibits 3-3a and 3-3b; Alternative 1 is shown in Exhibits 3-5a and 3-5b) of this Program EIR. The construction emissions analysis reflects full removal and replacement of the aprons and service roads.

The Federal Aviation Administration's ("FAA") Aviation Environmental Design Tool ("AEDT", Version 2d) was used to model operational emissions from aircraft operations, auxiliary power units ("APU"), and ground support equipment ("GSE") at the Airport.[3] AEDT is a software system that models aircraft performance that estimates fuel consumption, emissions, noise, and air quality emissions data. AEDT is a comprehensive tool that provides information to FAA stakeholders on each of these specific environmental impacts. AEDT facilitates environmental review by consolidating the modeling of these environmental impacts in a single tool. Specific aircraft types, times of operation, and annual runway end utilization were obtained from the 2016 John Wayne General Aviation Noise Ordinance database and input into AEDT.

4.2.4 EXISTING CONDITIONS

Climate and Meteorology

Climate in the SoCAB is determined by its terrain and geographical location. The SoCAB is a coastal plain with connecting broad valleys and low hills. The SoCAB is bound on the west by the Pacific Ocean, on the north by the San Gabriel Mountains, on the north and east by the San Bernardino Mountains, on the southeast by the San Jacinto Mountains, and on the south the Santa Ana Mountains. The region lies in the semi-permanent high-pressure zone of the eastern Pacific. The resulting climate is mild and tempered by cool ocean breezes. It maintains moderate temperatures and comfortable humidity, and limits precipitation to a few storms during the winter-wet season. This weather pattern is rarely interrupted. However, periods of extremely hot weather, winter storms, or Santa Ana winds do exist.

Although the SoCAB has a semi-arid climate, air near the surface is generally moist because of the presence of a shallow marine layer. With very low average wind speeds, there is a limited capacity to disperse air contaminants horizontally. The typical wind flow pattern fluctuates only with occasional winter storms or strong northeasterly Santa Ana winds from the mountains and deserts northeast of the SoCAB. Summer wind flow patterns represent maximum environmental impact conditions, as this is the period of higher temperatures and more sunlight, which results in ozone formation.

Local Air Quality Monitoring Data

The SCAQMD has established an air quality monitoring network that measures air pollution at 38 permanent monitoring stations and five single-pollutant source monitoring sites in the SoCAB. The Costa Mesa monitoring station was the closest station to the Airport; it was located approximately three miles southwest of the Airport and monitored O_3, NO_2, CO, and SO_2. The closest monitoring station that monitors particulate matter is located in Anaheim, approximately 11 miles north of the Airport.

According to the SCAQMD, concentrations of the criteria pollutants at the Costa Mesa station were stable over the past few years, with CO, NO_2, SO_2 levels not exceeding federal and state

[3] Ground support equipment ("GSE") is used to service aircraft between flights. Typical GSE includes air conditioning, air start, baggage tractors, belt loaders, and emergency vehicles that support airport operations. GSE are modeled by assignment to an aircraft operation. Auxiliary power units ("APU") are equipment used while the aircraft is at the gate to operate the heating, air conditioning, and electric systems.

standards. Ozone has exceeded the federal 8-hour standard the last three years. At the Anaheim station, $PM_{2.5}$ levels have exceeded the federal and state standards the last three years and the PM_{10} levels have exceeded the state standards the last three years (Landrum & Brown 2018).

Sensitive Receptors

Sensitive receptors are segments of the population which are most susceptible to impacts from air pollution, including children, the elderly, and people with pre-existing health problems affected by air quality. Sensitive receptors that could be affected may include residential areas, as well as discrete receptors, including long-term health care facilities, rehabilitation centers, convalescent centers, retirement homes, residences, schools, playgrounds, childcare centers, and athletic facilities. The closest sensitive receptors (i.e., the receptors closest to the boundary of the Airport) are the residential units south of the Airport, which are located approximately 855 feet south of the Airport at the closest point (Landrum & Brown 2018).

Baseline (2016) Emissions Inventory

The AEDT was used to model general aviation aircraft operations only at the Airport, along with GSE and APU usage for the Baseline (2016) Conditions. The model estimates the rate of emissions of the quantity of emissions of the pollutants in pounds per day. The results of the emission inventory are provided in Table 4.2-3. This data will be used when calculating the net emissions associated with implementation of the GAIP scenarios.

TABLE 4.2-3
EMISSIONS INVENTORY FOR GENERAL AVIATION ACTIVITIES
BASELINE (2016)

Source	Daily Emissions (pounds per day)					
	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Total	**3,250.0**	**166.7**	**187.3**	**28.4**	**7.9**	**7.9**

CO: carbon monoxide; VOC: volatile organic compound; NOx: nitrogen oxides; SOx: sulfur oxides; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less

Note: Numbers may not sum to subtotals as shown, due to rounding. Section 3 of Appendix E also provides Airport-wide existing conditions data for 2016. Because the GAIP exclusively pertains to and affects general aviation operations at JWA, the inventory data presented in this Section of the Program EIR is focused on general aviation-related emissions. For additional information on Airport-wide emissions that accounts for commercial aircraft, please see Appendix E.

Source: Landrum & Brown, 2018. (Appendix E).

4.2.5 THRESHOLDS OF SIGNIFICANCE

In accordance with the County's Environmental Analysis Checklist and Appendix G of the State CEQA Guidelines, the project would result in a significant impact to air quality if it would[4]:

Threshold 4.2-1 Conflict with or obstruct implementation of the applicable air quality plan.

Threshold 4.2-2 Violate any air quality standard or contribute substantially to an existing or projected air quality violation.

Threshold 4.2-3 Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or State ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors).

Threshold 4.2-4 Expose sensitive receptors to substantial pollutant concentrations.

Appendix G of the State CEQA Guidelines states that the significance criteria established by the applicable air quality management district may be relied upon to make significance determinations. The SCAQMD has established significance thresholds to assess the regional and localized impacts of project-related air pollutant emissions; Table 4.2-4 presents the most current standards for assessing the potential significance of impacts. A project with daily emission rates, risk values, or concentrations below these thresholds is generally considered to have a less than significant impact on air quality.

[4] Section 4.5 of the Air Quality Technical Report (Appendix E) provides a discussion of odors associated with construction activities and finds that the impact would be less than significant for both the Proposed Project and Alternative 1. The Notice of Preparation prepared for the GAIP (provided in Appendix A) identified that the GAIP does not propose any land uses or modification to operations that would result in the creation of odors. The existing operations at the Airport involve minor odor-generating activities such as airplane exhaust; however, these types of odors are typical of an airport and would not create an odor nuisance pursuant to South Coast Air Quality Management District 's ("SCAQMD's") Rule 402 or extend beyond the limits of the Airport.

TABLE 4.2-4
SCAQMD AIR QUALITY SIGNIFICANCE THRESHOLDS

Mass Daily Thresholds (lbs/day)		
Pollutant	**Construction**	**Operation**
NOx	100	55
VOC	75	55
PM10	150	150
PM2.5	55	55
SOx	150	150
CO	550	550
Lead	3	3
Toxic Air Contaminants		
TACs[a]	Maximum Incremental Cancer Risk ≥ 10 in 1 million Cancer Burden > 0.5 excess cancer cases (in areas ≥ 1 in 1 million) Chronic & Acute Hazard Index ≥ 1.0 (project increment)	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402	
GHG[c]	10,000 metric tons per year CO2 equivalency for industrial facilities	
Ambient Air Quality For Criteria Pollutants[b]		
NO_2 1-Hour Average Annual Arithmetic Mean	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: • 0.18 ppm (state) • 0.03 ppm (state) and 0.0534 ppm (Federal)	
PM10 24-Hour Average Annual Average	 10.4 µg/m^3 (construction)[e] & 2.5 µg/m^3 (operation) 1.0 µg/m^3	
PM2.5 24-Hour Average	 10.4 µg/m^3 (construction)[e] & 2.5 µg/m^3 (operation)	
SO2 1-Hour Average 24-Hour Average	 0.25 ppm (state) & 0.075 ppm (Federal – 99th percentile) 0.04 ppm (state)	
Sulfate 24-Hour Average	 25 µg/m^3 (state)	
Lead 30-day average Rolling 3-month average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: • 20 ppm (state) and 35 ppm (Federal) • 9.0 ppm (state/Federal)	

TABLE 4.2-4
SCAQMD AIR QUALITY SIGNIFICANCE THRESHOLDS

Mass Daily Thresholds (lbs/day)
lbs/day: pounds per day; VOC: volatile organic compound; NOx: nitrogen oxides; CO: carbon monoxide; SOx: sulfur oxides; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less; NO_2: nitrogen dioxide; ; µg/m3: microgram per cubic meter
[a] TACs (carcinogenic and noncarcinogenic)
[b] Ambient air quality threshold based on SCAQMD Rule 403.
[c] Greenhouse Gas Emissions are evaluated in Section 4.4 of this Program EIR.
Source: Landrum & Brown 2018 (taken from http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf Retrieved 11/20/2017.

In addition, and in order to assist lead agencies with the evaluation of local air quality impacts without complex dispersion modeling, the SCAQMD has developed a localized significance threshold ("LST") methodology and mass rate look-up tables by source receptor area ("SRA") that can be used to determine whether a project may generate significant adverse localized air quality impacts. LSTs represent the maximum emissions from a project that will not cause or contribute to an exceedance of the most stringent applicable state ambient air quality standard, and are developed based on the ambient concentrations of that pollutant for each SRA. The LST mass rate look-up tables are applicable to the following criteria pollutants: NO_X, CO, PM_{10}, and $PM_{2.5}$. The LSTs used in this analysis are presented in Table 4.2-5 below.

TABLE 4.2-5
SCAQMD LOCALIZED SIGNIFICANCE THRESHOLDS

	Localized Significance Threshold (pounds per day)			
	CO	**NO_x**	**PM_{10}**	**$PM_{2.5}$**
Construction	3,888	223	85	35
Operation	3,888	223	21	9
Source: Landrum & Brown 2018 (taken from SCAQMD Localized Significance Thresholds, 2009				

While the LST mass rate look-up tables are represented for projects up to five acres, the LST methodology can be applied to projects larger than five acres as a screening tool as it is a conservative approach. If the emissions from a project with a larger site are less than the allowable emissions for a 5-acre project site, then the larger project site will not result in a significant localized air quality impact. The largest area under construction for the GAIP at one time is approximately 8 acres.

4.2.6 REGULATORY REQUIREMENTS AND STANDARD CONDITIONS OF APPROVAL

Implementation of the GAIP assumes compliance with existing regulations related to air quality at the Airport, as discussed under Section 4.2.1, Regulatory Setting, above. These include the regulatory requirements ("RR") listed below. There are no County Standard Conditions of Approval pertaining to air quality that would be applicable to the GAIP.

RR AQ-1 During construction, the developer shall comply with South Coast Air Quality Management District ("SCAQMD") Rules 402 and 403, in order to minimize short-term emissions of dust and particulates. SCAQMD Rule 402 requires that air pollutant emissions not be a nuisance off site. SCAQMD Rule 403 requires that fugitive dust be controlled with the best available control measures so that the presence of such dust does not remain visible in the atmosphere beyond the property line of the emission source. This requirement shall be included as notes on the contractor specifications. Table 1 of Rule 403 prescribes the Best Available Control Measures that are applicable to all construction projects. The developer shall provide the Manager of Building & Safety, or designee, with an SCAQMD-approved Dust Control Plan or other sufficient proof of compliance with Rule 403, prior to issuance of a grading permit.

RR AQ-2 Architectural coatings shall be selected so that the volatile organic compound ("VOC") content of the coatings is compliant with SCAQMD Rule 1113. This requirement shall be included as notes on the contractor specifications. The specifications for each project within the GAIP area shall be reviewed by the Manager of Building & Safety, or designee, for compliance with this requirement prior to issuance of a building permit.

4.2.7 IMPACT ANALYSIS

Threshold 4.2-1

- ***Would the Project conflict with or obstruct implementation of the applicable air quality plan?***

Proposed Project and Alternative 1

As previously stated, the SCAQMD adopted its latest AQMP in 2016, which was then incorporated into the SIP in 2017. SCAQMD's 2016 AQMP relies on the latest scientific and technological information and planning assumptions relevant to air quality, including information regarding regional growth forecasts and transportation control measures from SCAG's 2016-2040 RTP/SCS. The 2016 AQMP also is built on extensive consultation between CARB and SCAQMD regarding the reduction of emissions from mobile sources. In that vein, the 2016 AQMP recognizes that some sources – referred to as "federally controlled sources" in the AQMP – are under the jurisdiction of the U.S. EPA; the 2016 AQMP explicitly recognizes aircraft as a federally controlled source (see, e.g., 2016 AQMP, Table 4-22). The 2016 AQMP provides policies and measures to guide the SoCAB towards attainment of the NAAQS and CAAQS, setting forth a

comprehensive strategy aimed at controlling pollution from all sources, including stationary sources, on-road and off-road mobile sources, and area sources. Because the SCAQMD does not have jurisdictional authority over all emission sources in the SoCAB, the 2016 AQMP identifies other agencies (see, e.g., 2016 AQMP, Table 4-22) that are responsible for assisting with implementation of the AQMP's control measures.

In conjunction with preparation of the 2016-2040 RTP/SCS and 2016 AQMP, JWA staff participated in SCAG's Aviation Technical Advisory Committee and coordinated with SCAQMD to ensure that aircraft operation data specific to the Airport (such as the number of operations, fleet mix and taxi times) were accounted for throughout the forecasted planning period for both the RTP/SCS and AQMP. JWA staff also provided SCAQMD with information regarding estimated construction-related emissions at the Airport during the subject planning period, including those associated with the development of any GAIP-facilitated facilities. As a result of this inter-agency coordination, emissions associated with the GAIP have been planned for and accounted for in the 2016 AQMP. It also is noted that – to the extent required by law – GAIP-related emission sources would comply with applicable control measures adopted in furtherance of the AQMP's implementation by the SCAQMD and other responsible agencies. Therefore, neither the Proposed Project nor Alternative 1 would conflict with or obstruct implementation of the 2016 AQMP (Landrum & Brown 2018).

Impact Conclusion: *The Proposed Project and Alternative 1 would be consistent with the AQMP. JWA staff participated in SCAG's Aviation Technical Advisory Committee and coordinated with SCAQMD to ensure that aircraft operation data specific to the Airport (such as the number of operations, fleet mix and taxi times) and construction emissions were accounted for throughout the forecasted planning period for both the 2016-2040 RTP/SCS and AQMP. Therefore, the impacts associated Proposed Project and Alternative 1 would be less than significant under Threshold 4.2-1.*

Threshold 4.2-2

- ***Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?***

Proposed Project

Construction

When calculating construction emissions for the Proposed Project, CalEEMod defaults were used for construction equipment and for trip generation data. RR AQ-1 and RR AQ-2, which require compliance with SCAQMD Rules 402, 403, and 1113, also were incorporated into the modeling for the Proposed Project.

Table 4.2-6 shows the emission values for each year of construction prior to mitigation. With the exception of NOx emissions, the maximum daily construction emissions for the Proposed Project, would be below both the SCAQMD mass regional and the localized significance thresholds.

TABLE 4.2-6
UNMITIGATED MAXIMUM DAILY CONSTRUCTION EMISSIONS
FOR THE PROPOSED PROJECT

Year	Daily Emissions (pounds per day)					
	CO	**VOC**	**NO_x**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
2019	137.5	19.3	**189.1**	0.2	14.8	11.3
2020	154.7	20.2	**198.4**	0.3	16.1	11.5
2021	128.0	15.7	**142.9**	0.2	9.1	7.3
2022	134.2	16.3	**129.9**	0.2	10.3	6.7
2023	84.9	8.9	83.6	0.1	7.8	4.9
2024	147.2	15.5	**132.6**	0.3	14.9	7.9
2025	202.8	17.4	**147.3**	0.3	8.7	6.5
2026	59.2	57.8	38.3	0.1	1.8	1.6
SCAQMD Mass Daily Threshold (Table 4.2-3)	*550*	*75*	*100*	*150*	*150*	*55*
Exceed Threshold?	**No**	**No**	**Yes**	**No**	**No**	**No**
SCAQMD Localized Significance Threshold (Table 4.2-5)	*3,888*	*N/A*	*223*	*N/A*	*85*	*35*
Exceed Localized Significance Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

VOC: volatile organic compound; NOx: nitrogen oxides; CO: carbon monoxide; SOx: sulfur oxides; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less; SCAQMD: South Coast Air Quality Management District; CEQA: California Environmental Quality Act.

Note: Shading and bold font indicates an exceedance of SCAQMD thresholds

Source: Landrum & Brown 2018 (Emissions calculations are included in Appendix E.)

As shown in Table 4.2-6 above, the Proposed Project's construction emissions would exceed the SCAQMD significance threshold for NO_X. To reduce maximum daily construction emissions from the Proposed Project to less than significant, MM AQ-1, which requires construction equipment to meet or exceed the USEPA's Tier 4 off-road emissions engine standards, must be implemented. With implementation of MM AQ-1, maximum daily construction emissions would be less than significant with mitigation, as shown in Table 4.2-7 below. Although significant impacts were not identified for VOC, MN AQ-1 requires the use of architectural coatings applied to the East and West Access Roads be low VOC coatings. Specifically, JWA shall require the use of a paint for markings with less than 50 grams of VOC emissions per liter of paint.

TABLE 4.2-7
MITIGATED MAXIMUM DAILY CONSTRUCTION EMISSIONS
FOR THE PROPOSED PROJECT

Year	Daily Emissions (pounds per day)					
	CO	**VOC**	**NO_x**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
2019	146.1	3.0	13.3	0.2	4.8	2.0
2020	167.6	3.3	15.0	0.3	6.0	2.2
2021	138.1	3.1	16.1	0.2	1.9	0.6
2022	144.5	4.3	17.3	0.2	3.3	0.8
2023	94.0	1.9	10.2	0.1	4.1	1.5
2024	162.5	4.1	18.1	0.3	10.2	2.8
2025	233.7	5.5	21.2	0.3	6.6	1.5
2026	67.4	28.0	5.7	0.1	0.1	0.1
SCAQMD Mass Daily Threshold (Table 4.2-3)	*550*	*75*	*100*	*150*	*150*	*55*
Exceed Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
SCAQMD Localized Significance Threshold (Table 4.2-5)	*3,888*	*N/A*	*223*	*N/A*	*85*	*35*
Exceed Localized Significance Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

VOC: volatile organic compound; NOx: nitrogen oxides; CO: carbon monoxide; SOx: sulfur oxides; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less; SCAQMD: South Coast Air Quality Management District; CEQA: California Environmental Quality Act.

Source: Landrum & Brown 2018 (Emissions calculations are included in Appendix E.)

Operations

The Proposed Project would result in changes to the Airport's general aviation aircraft operations and fleet mix. The Proposed Project would not change the number of commercial air carrier operations, fleet mix, runway use, flight tracks, or terminal area. Therefore, emission sources related to the change in general aviation aircraft operations and fleet mix are evaluated using the AEDT. These sources include general aviation aircraft operations, APU usage, and GSE usage. The year 2026 is used for the Proposed Project because that is expected completion date of the GAIP improvements and would be reflective of the ultimate fleet mix and number of operations.

Impacts from the Proposed Project have been evaluated in comparison to the Baseline (2016) Conditions. (The Baseline (2016) emissions inventory is presented in Table 4.2-3, provided in Section 4.2.4, Existing Conditions.) Because the Proposed Project only pertains to general aviation activity, the analysis compares the Baseline (2016) general aviation emissions to the Baseline Plus Proposed Project (2026). This is reflective of the CEQA requirement for an "Existing Plus Project" evaluation.

The results of the emission inventory are provided in Table 4.4-8.

TABLE 4.2-8
EMISSIONS INVENTORY—BASELINE (2016) PLUS PROPOSED PROJECT

Source	Emissions (pounds per day)					
	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Total General Aviation Emissions	2,884.3	194.8	226.5	34.6	8.7	8.7

VOC: volatile organic compounds; NOx: nitrogen oxides; CO: carbon monoxide; SOx: sulfur oxides; PM10: respirable particulate matter 10 microns or less in diameter; PM2.5: fine particulate matter 2.5 microns or less in diameter; SCAQMD: South Coast Air Quality Management District.

Note: Some totals do not add due to rounding. Section 3 of Appendix E also provides Airport-wide existing conditions data for 2016. Because the GAIP exclusively pertains to and affects general aviation operations at JWA, the inventory data presented in this Section of the Program EIR is focused on general aviation-related emissions. For additional information on Airport-wide emissions that accounts for commercial aircraft, please see Appendix E.

Source: Landrum & Brown 2018. CalEEMod model data sheets are included in Appendix E.

Table 4.2-9 provides the net emissions for the Baseline Plus Proposed Project. The daily net impact of operational emissions was calculated by subtracting the operational emissions of the Baseline (2016) Conditions from those of the Baseline Plus Proposed Project. When compared to the SCAQMD regional and localized significance thresholds, no operational exceedances have been identified. Although significant impacts were not identified, MN AQ-2 requires the use of Zero Emission Vehicle ("ZEV") GSE where available (e.g. tugs, water carts, lavatory carts, other ramp service equipment/vehicles) for 90 percent or greater of the GSE operating hours.

TABLE 4.2-9
TOTAL NET OPERATIONAL EMISSIONS
FOR THE PROPOSED PROJECT

Scenarios	Emissions (pounds per day)					
	CO	**VOC**	**NO_x**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
Baseline (2016) Conditions (Table 4.2-3)	3,250.0	166.7	187.3	28.4	7.9	7.9
Baseline Plus Proposed Project (Table 4.2-8)	2,884.3	194.8	226.5	34.6	8.7	8.7
Baseline Plus Proposed Project Net Operational Emissions	**-365.7**	**28.1**	**39.2**	**6.3**	**0.8**	**0.8**
SCAQMD Mass Daily Threshold (Table 4.2-4)	*550*	*55*	*55*	*150*	*150*	*55*
Exceed Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
SCAQMD Localized Significance Threshold (Table 4.2-5)	*3,888*	*N/A*	*223*	*N/A*	*21*	*9*
Exceed Localized Significance Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

VOC: volatile organic compound; NOx: nitrogen oxides; CO: carbon monoxide; SOx: sulfur oxides; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less; SCAQMD: South Coast Air Quality Management District; EIR: Environmental Impact Report; CEQA: California Environmental Quality Act.

Note: Operational emissions for all pollutants, except for CO, are anticipated to increase with the Proposed Project due to an increase in turbo jet and business jet operations from the Baseline (2016) Condition. The decrease in CO is attributed to the decrease in prop operations estimated for the Proposed Project.

Source: Landrum & Brown 2018. Emissions calculations can be found in Appendix E.

Impact Conclusion *The Proposed Project would not violate any air quality standard or contribute substantially to an existing or projected air quality violation. Significant NO_X emissions associated with construction would be reduced to less than significant with the implementation of MM AQ-1, which requires the use of Tier 4 construction equipment. Additionally, MN AQ-1, which requires the use of low VOC architectural coatings on the East and West Access Roads, would serve to further reduce VOC emissions. Although significant VOC impacts associated with operations were not identified, MN AQ-2 requires the use of ZEV GSE, where available (e.g. tugs, water carts, lavatory carts, other ramp service equipment/vehicles) for 90 percent or greater of the GSE operating hours. Operational emissions of criteria pollutants would be below established thresholds established by the SCAQMD for the SoCAB. Therefore, impacts associated with the Proposed Project under Threshold 4.2-2 would be less than significant with mitigation for construction and less than significant for operations.*

Alternative 1

Construction

When calculating construction emissions for Alternative 1 CalEEMod defaults were used for construction equipment and for trip generation data. RR AQ-1 and RR AQ-2, which requires compliance with SCAQMD Rules 402, 403, and 1113, also were incorporated into the modeling for Alternative 1.

Table 4.2-10 shows the emission values for each year of construction prior to mitigation. With the exception of NOx emissions, the maximum daily construction emissions for Alternative 1 would be below both the SCAQMD mass regional and the localized significance thresholds.

TABLE 4.2-10
UNMITIGATED MAXIMUM DAILY CONSTRUCTION EMISSIONS
FOR ALTERNATIVE 1

Year	Daily Emissions (pounds per day)					
	CO	**VOC**	**NO_x**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
2019	155.0	21.8	**214.6**	0.3	18.4	13.0
2020	157.0	20.4	**200.5**	0.3	15.9	11.6
2021	128.0	15.7	**142.9**	0.2	10.5	7.5
2022	152.0	26.8	**140.6**	0.3	17.9	8.4
2023	120.3	12.2	**116.0**	0.2	11.5	6.9
2024	124.5	13.2	**111.4**	0.2	11.8	6.7
2025	204.3	17.5	**151.2**	0.3	10.9	6.9
2026	89.9	65.9	59.4	0.1	2.7	2.5
SCAQMD Mass Daily Threshold (Table 4.2-3)	*550*	*75*	*100*	*150*	*150*	*55*
Exceed Threshold?	**No**	**No**	**Yes**	**No**	**No**	**No**
SCAQMD Localized Significance Threshold (Table 4.2-5)	*3,888*	*N/A*	*223*	*N/A*	*85*	*35*
Exceed Localized Significance Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

VOC: volatile organic compound; NOx: nitrogen oxides; CO: carbon monoxide; SOx: sulfur oxides; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less; SCAQMD: South Coast Air Quality Management District; CEQA: California Environmental Quality Act.

Note: Shading and bold font indicates an exceedance of SCAQMD thresholds

Source: Landrum & Brown 2018 (Emissions calculations are included in Appendix E.)

As shown in Table 4.2-10 above, the construction emissions associated with Alternative 1 would exceed the SCAQMD significance threshold for NO_X. To reduce maximum daily construction emissions from Alternative 1 to less than significant, MM AQ-1, which requires construction equipment to meet or exceed the USEPA's Tier 4 off-road emissions engine standards, must be implemented. With implementation of MM AQ-1, maximum daily construction emissions would be less than significant, as shown in Table 4.2-11 below. Although significant impacts were not identified for VOCs, MN AQ-1 requires the use of architectural coatings applied to the East and West Access Roads be low VOC coatings. Specifically, JWA shall require the use of a paint for markings with less than 50 grams of VOC emissions per liter of paint.

TABLE 4.2-11
MITIGATED MAXIMUM DAILY CONSTRUCTION EMISSIONS
FOR ALTERNATIVE 1

Year	Daily Emissions (pounds per day)					
	CO	**VOC**	**NO_x**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
2019	163.4	3.3	14.7	0.3	6.9	2.3
2020	171.4	3.6	22.4	0.3	5.9	2.4
2021	138.1	3.2	23.1	0.2	2.4	1.1
2022	153.6	8.4	19.9	0.2	9.3	1.7
2023	137.1	2.8	11.9	0.2	6.4	2.2
2024	137.9	3.7	14.4	0.2	7.0	2.3
2025	233.9	5.2	22.2	0.3	4.7	1.2
2026	102.2	31.5	9.2	0.1	0.2	0.2
SCAQMD Mass Daily Threshold (Table 4.2-3)	*550*	*75*	*100*	*150*	*150*	*55*
Exceed Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
SCAQMD Localized Significance Threshold (Table 4.2-5)	*3,888*	*N/A*	*223*	*N/A*	*85*	*35*
Exceed Localized Significance Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

VOC: volatile organic compound; NOx: nitrogen oxides; CO: carbon monoxide; SOx: sulfur oxides; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less; SCAQMD: South Coast Air Quality Management District; CEQA: California Environmental Quality Act.

Note: PM_{10} and $PM_{2.5}$ emissions estimates are based on compliance with the SCAQMD Rule 403 requirements for fugitive dust suppression.

Source: Landrum & Brown 2018 (Emissions calculations are included in Appendix E.)

Operations

Alternative 1 would result in changes to the Airport's general aviation aircraft operations and fleet mix. Alternative 1 would not change the number of commercial air carrier operations, fleet mix, runway use, flight tracks, or terminal area. Therefore, only emission sources related to the change in general aviation aircraft operations and fleet mix are evaluated using the AEDT. These sources include general aviation aircraft operations, APU usage, and GSE usage. The year 2026 is used for the evaluation of Alternative 1 because that is expected completion date of the GAIP improvements and would be reflective of the ultimate fleet mix and number of operations.

Impacts from Alternative 1 have been evaluated in comparison to the Baseline (2016) Conditions. (The Baseline (2016) emissions inventory is presented in Table 4.2-3, provided in Section 4.2.4, Existing Conditions.) Because Alternative 1 only pertains to general aviation activity, the analysis compares the Baseline (2016) general aviation emissions to the Baseline Plus Alternative 1 (2026). This is reflective of the CEQA requirement for an "Existing Plus Project" evaluation.

The results of the emission inventory are provided in Table 4.4-12.

TABLE 4.2-12
EMISSIONS INVENTORY—BASELINE (2016) PLUS ALTERNATIVE 1

Source	Emissions (pounds per day)					
	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Total General Aviation Emissions	2,904.2	198.4	229.9	35.2	8.8	8.8

VOC: volatile organic compounds; NOx: nitrogen oxides; CO: carbon monoxide; SOx: sulfur oxides; PM10: respirable particulate matter 10 microns or less in diameter; PM2.5: fine particulate matter 2.5 microns or less in diameter; SCAQMD: South Coast Air Quality Management District.

Note: Some totals do not add due to rounding. Section 3 of Appendix E also provides Airport-wide existing conditions data for 2016. Because the GAIP exclusively pertains to and affects general aviation operations at JWA, the inventory data presented in this Section of the Program EIR is focused on general aviation-related emissions. For additional information on Airport-wide emissions that accounts for commercial aircraft, please see Appendix E

Source: Landrum & Brown 2018. CalEEMod model data sheets are included in Appendix E.

Table 4.2-13 provides the net emissions for the Baseline Plus Alternative 1. The daily net impact of operational emissions was calculated by subtracting the operational emissions of the Baseline (2016) Conditions from those of the "Baseline Plus Alternative 1" scenario. When compared to the SCAQMD regional and localized significance thresholds, no operational exceedances have been identified. Although significant impacts were not identified, MN AQ-2 requires the use of Zero Emission Vehicle ("ZEV") GSE where available (e.g. tugs, water carts, lavatory carts, other ramp service equipment/vehicles) for 90 percent or greater of the GSE operating hours.

TABLE 4.2-13
TOTAL NET OPERATIONAL EMISSIONS
FOR ALTERNATIVE 1

Scenarios	Emissions (pounds per day)					
	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Baseline (2016) Conditions (Table 4.2-3)	3,250.0	166.7	187.3	28.4	7.9	7.9
Baseline Plus Alternative 1 (Table 4.2-12)	2,904.2	198.4	229.9	35.2	8.8	8.8
Baseline Plus Alternative 1 Net Operational Emissions	-345.8	31.8	42.6	6.8	0.9	0.9
SCAQMD Mass Daily Threshold (Table 4.2-4)	*550*	*55*	*55*	*150*	*150*	*55*
SCAQMD Localized Significance Threshold (Table 4.2-5)	*3,888*	*N/A*	*223*	*N/A*	*21*	*9*
Baseline Plus Alternative 1 Exceed Significance Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

lbs/day: pounds per day; VOC: volatile organic compound; NOx: nitrogen oxides; CO: carbon monoxide; SOx: sulfur oxides; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less; SCAQMD: South Coast Air Quality Management District; EIR: Environmental Impact Report; CEQA: California Environmental Quality Act.

Source: Landrum & Brown 2018. Emissions calculations can be found in Appendix E.

Impact Conclusion *Alternative 1 would not violate any air quality standard or contribute substantially to an existing or projected air quality violation. Emissions associated with construction would be reduced to less than significant with*

the implementation of MM AQ-1, which requires the use of Tier 4 construction equipment. Additionally, MN AQ-1, which requires the use of low VOC architectural coatings on the East and West Access Roads, would serve to further reduce VOC emissions. Although significant impacts were not identified for VOCs, MN AQ-2 requires the use of ZEV GSE, where available (e.g. tugs, water carts, lavatory carts, other ramp service equipment/vehicles) for 90 percent or greater of the GSE operating hours. Operational emissions of criteria pollutants would be below established thresholds established by the SCAQMD for the SoCAB. Therefore, impacts associated with Alternative 1 under Threshold 4.2-2 would be less than significant with mitigation for construction and less than significant for operations.

Threshold 4.2-3

- ***Would the Project result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?***

Proposed Project and Alternative 1

Cumulative impacts analysis for air quality is based on the guidance provided by SCAQMD (SCAQMD 2003). Pursuant to that guidance, projects that exceed the project-specific significance thresholds are considered by the SCAQMD to be cumulatively considerable. Projects that do not exceed the project-specific thresholds are generally not considered cumulatively significant.

As discussed under Threshold 4.2-2, both the Proposed Project and Alternative 1 air emissions would be less than significant. Construction emissions would be less than significant with implementation of mitigation and the operational emissions would be less than significant prior to mitigation. Additionally, the GAIP (Proposed Project and Alternative 1) has been included as part of the regional long-range forecasted planning period for both the 2016-2040 RTP/SCS and AQMP (see Threshold 4.2-1). Therefore, the GAIP (Proposed Project and Alternative 1) would not result in cumulatively considerable net increase of any criteria pollutant for which the SoCAB region has a non-attainment status under an applicable federal or state ambient air quality standard and impacts would be less than significant.

Impact Conclusion: *Based on the SCAQMD guidance, projects that exceed the project-specific significance thresholds are considered by the SCAQMD to be cumulatively considerable. Neither the Proposed Project nor Alternative 1 would exceed the project-specific thresholds with mitigation; therefore, they would not result in a cumulatively considerable net increase of any criteria pollutant for which the SoCAB region has a non-attainment status under an applicable federal or state ambient air quality standard. Under Threshold 4.2-3, impacts for the Proposed Project and Alternative 1 would be less than significant.*

Threshold 4.2-4

- ***Would the Project expose sensitive receptors to substantial pollutant concentrations?***

Proposed Project and Alternative 1

Criteria Pollutants

Local concentrations and emissions of criteria pollutants generated during construction and operation of the GAIP (Proposed Project and Alternative 1) are addressed under Threshold 4.2-2. Because emissions would be less than SCAQMD significance thresholds with mitigation, sensitive receptors would not be exposed to substantial pollutant concentrations.

Toxic Air Contaminants

Construction Emissions

As discussed above, CARB identified diesel PM from diesel-fueled engines as a TAC. It is assumed that the majority of the heavy-duty construction equipment utilized during construction of the Proposed Project would be diesel fueled and emit diesel PM. The expected types of heavy-duty equipment include cranes, excavators, graders, dozers, and scrapers. These pieces of equipment would primarily be used during grading and demolition activities.

During the construction of the Proposed Project, demolition and grading activities would occur approximately 25 percent of the time throughout the seven-year construction period (approximately 630 days for the Proposed Project and 595 days for Alternative 1). Additionally, not only is the overall percentage of the construction time dedicated to grading and demolition activities relatively short, this would be broken into each of the 14 or 15 primary construction phases, for the Proposed Project and Alternative 1, respectively. Therefore, the grading and demolition would not occur for the estimated 630 days or 595 days straight but would be for short durations as part of each of the phases. The other phases of construction, such as when the vertical development is occurring, do not emit substantial diesel PM.

Given the overall construction schedule and limited durations with grading and demolition activities, the diesel PMs resulting from construction of the Proposed Project are not expected to result in a significant impact. Furthermore, all construction activities would be confined to the Airport property and away from sensitive receptors, including residential areas. In addition, MM-AQ-1 requires the use of Tier 4 equipment for construction activities, which requires the use of cleaner engines and would further reduce potential diesel PM emissions during all construction activities.

Operational Emissions

The GAIP (Proposed Project and Alternative 1) would result in emissions from general aviation aircraft, and the usage of APUs and GSE associated with the corresponding aeronautical activity. Based on the aviation forecasts prepared for the GAIP, the Baseline (2016) Plus Proposed Project and Baseline (2016) Plus Alternative 1 scenarios would result in a decrease in the total number

of general aviation aircraft operations. However, due to the anticipated change in the aircraft fleet mix, there is an estimated overall increase in criteria air pollutant emissions (see discussion under Threshold 4.2-2). In addition to an increase in the criteria pollutants discussed above, there would be potential increases in TACs. In order to evaluate the environmental significance of the GAIP-related TACs, the health risk analysis ("HRA") conducted for Final EIR 617, prepared for the 2014 Settlement Agreement Amendment, was used as a basis to assess the potential health risk impacts. The HRA prepared for Final EIR 617 is hereby incorporated by reference and is summarized below.

The HRA prepared for Final EIR 617 was conducted in accordance with CARB's Air Toxics Hot Spots Program Risk Assessment Guidelines and is consistent with risk assessment guidance documents issued by USEPA and the California Environmental Protection Agency's ("CalEPA") Department of Toxic Substances Control. Simplifying assumptions were also obtained from the SCAQMD risk assessment guidelines. Compounds were evaluated for their potential health effects in two categories, carcinogenic and non-carcinogenic.

The Chemicals of Potential Concern ("COPC") emissions were estimated using th e FAA Emissions Dispersion and Modeling System ("EDMS") and include emissions from startup, taxi out, take off, climb out, approach, and taxi in. EDMS provides emission estimates for 394 organic gases, of which 45 are hazardous air pollutants. The health risk posed by the identified COPCs are estimated using air dispersion modeling tools.

Per SCAQMD HRA guidance for cancer risk analysis, a continuous exposure of 24 hours per day, 350 days per year for a 70-year lifetime is assumed for residents in Final EIR 617. This is a highly conservative assumption, since most people do not remain at home all day and, on average, residents change residences every 11 to 12 years. In addition, the Final EIR 617 analysis conservatively assumes that residents are experiencing outdoor concentrations for the entire exposure period. The same conservative assumptions are used in Final EIR 617 for non-residential sensitive receptors, such as daycare centers, schools, hospitals, and other care facilities.

For occupational receptors, and in accordance with SCAQMD guidance, Final EIR 617 assumes an exposure based on 8 hours per day, 5 days per week, 245 working days per year, and a 40-year working lifetime. This again is a conservative assumption, since most people do not remain at the same job for 40 years. The SCAQMD also provides specific daily breathing rates and exposure value factors for estimating cancer risks that are used in Final EIR 617.

The Final EIR 617 HRA considered emissions associated with the following sources:

- Aircraft
- GSE
- APU
- On-road mobile sources, including vehicles in the JWA parking lots and structures; passenger-related terminal and off-site traffic; and JWA-owned vehicles and equipment
- JWA stationary source equipment, such as heaters/boilers, emergency engines, steam washers, surface cleaners, cooling towers, and gasoline and diesel dispensing tanks, as well as the central utility plant (i.e., CoGen facility).

To provide context, Final EIR 617 studied the health effects of increasing commercial carrier operations and the number of passengers served by approximately 15 percent from January 2016 to January 2026. The analysis in Final EIR 617 included a substantial increase in traffic associated with the increased number of passengers (i.e., an increase from 10.8 Million Annual Passengers ["MAP"] to 12.5 MAP). As a point of comparison, the GAIP (Proposed Project and Alternative 1) would decrease the overall number of general aviation operations by approximately 13 percent in this same period. The number of automobile trips accessing the Airport would be slightly reduced with the GAIP (Tables 4.8-6 and 4.8-13 in Transportation/Traffic provide the automobile trip numbers for the Proposed Project and Alternative 1, respectively). As previously noted, the GAIP would change the fleet mix to include fewer piston aircraft and an increase the use of turbine engine aircraft and jet operations. However, the reduction in the number of operations by piston aircraft would result in a reduction in the usage of avgas, which contains lead.[5]

Final EIR 617 concluded that the incremental increase in TACs associated with that project would result in less-than-significant health risk impacts for cancer risk, cancer burden, and chronic non-cancer risk for all receptors. Additionally, less-than-significant health risk impacts would result with respect to acute non-cancer risk for residents and other sensitive receptors. Significant acute non-cancer health risk impact for workers was identified in Final EIR 617. The SCAQMD's threshold for identifying a significant acute non-cancer health risk impact for workers is a hazard index ≥1.0. The analysis provided in Final EIR 617 identified that the selected alternative posed a risk of 1.0 in a million. Therefore, the acute non-cancer health risk impact to workers was identified as a significant and unavoidable. This information is summarized in Table 4.1-23 of Final EIR 617.

The analysis in the Final EIR 617 HRA was used as a screening mechanism for assessing the potential for the GAIP (Proposed Project and Alternative 1) to result in a significant health risk. As part of the screening process, the emissions associated with the 2014 Settlement Agreement Amendment and the emissions from the GAIP (Proposed Project and Alternative 1) were compared. The TAC emissions are often expressed as fractions of VOC and PM emissions for emissions from combustion, thus the VOC and PM emissions for the GAIP are relied upon in this screening analysis. A comparison of the criteria pollutant emissions associated with the 2014 Settlement Agreement Amendment and the net emissions associated with the GAIP (Proposed Project and Alternative 1) are presented in Table 4.2-14. As shown, the emissions of criteria pollutants associated with the GAIP (Proposed Project and Alternative 1) would be a fraction of the pollutants associated with the 2014 Settlement Agreement Amendment. The VOC emissions for the GAIP would be approximately 25 percent and 29 percent of the emissions evaluated for the 2014 Settlement Agreement Amendment for the Proposed Project and Alternative 1, respectively. For the Proposed Project, when compared to the 2014 Settlement Agreement Amendment, the PM emissions would be 0.49 percent and 1.9 percent for PM10 and PM2.5, respectively. Similarly, for Alternative 1, the PM emissions would be a small percentage of the PM emissions associated with the 2014 Settlement Agreement Amendment (i.e., 0.5 percent for PM10 and 2.1 percent for PM2.5).

[5] As discussed in Section 4.5, Hazards and Hazardous Materials, avgas is the only remaining lead-containing transportation fuel. Lead has been found to be a toxic substance. The U.S. Environmental Protection Agency ("USEPA") is expected to make a final determination on avgas in 2018. Replacement of aviation gasoline by 2018 is anticipated through the Piston Aviation Fuels Initiative ("PAFI") (AECOM 2018)

TABLE 4.2-14
NET OPERATIONAL EMISSIONS COMPARISON
2014 SETTLEMENT AGREEMENT AMENDMENT AND THE
BASELINE PLUS GAIP SCENARIOS

Scenarios	Emissions (pounds per day)					
	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$
2014 Settlement Agreement Amendment Emissions[a]	-5,343	111	758	78	164	43
Baseline + Proposed Project Net Operational Emissions (Table 4.2-9)	-365.7	28.1	39.2	6.3	0.8	0.8
GAIP Emissions as a Percentage of the 2014 Settlement Agreement Amendment Emissions	**6.8%[b]**	**25.3%**	**5.2%**	**8.1%**	**0.5%**	**1.9%**
Baseline + Alternative 1 Net Operational Emissions (Table 4.2-13)	-345.8	31.8	42.6	6.8	0.9	0.9
GAIP Emissions as a Percentage of the 2014 Settlement Agreement Amendment Emissions	**6.5%[b]**	**28.6%**	**5.6%**	**8.7%**	**0.5%**	**2.1%**

VOC: volatile organic compound; NOx: nitrogen oxides; CO: carbon monoxide; SOx: sulfur oxides; PM10: respirable particulate matter with a diameter of 10 microns or less; PM2.5: fine particulate matter with a diameter of 2.5 microns or less.

[a] Data presented in Table 4.1-8 of Final EIR 617. Values reflect Phase 3 emissions, which represent the highest values.

[b] Both the 2014 Settlement Agreement Amendment and the Proposed Project would reduce CO emissions.

Source: Landrum & Brown 2018 for the GAIP data; Final EIR 617 for the 2014 Settlement Agreement Amendment data.

As illustrated, the Proposed Project and Alternative 1 would result in a substantially smaller incremental increase in air pollutant emissions than the project studied in Final EIR 617. Thus, the increase in TAC emissions for the GAIP (Proposed Project and Alternative 1) would also be much smaller than that analyzed in the Final EIR 617. The potential health risk impacts for the GAIP (Proposed Project and Alternative 1) is, therefore, the impacts would be less than significant.

Therefore, based on the projected level of pollutant concentrations, the Proposed Project and Alternative 1 would not expose sensitive receptors to substantial pollutant concentrations.

Impact Conclusion: *The emissions associated with the Proposed Project and Alternative 1, after mitigation, would be less than the SCAQMD thresholds of significance for all criteria pollutants. Further, neither the Proposed Project nor Alternative 1 would result in substantial concentrations of TAC emissions as the concentrations would be below the significance thresholds for both workers and adjacent sensitive receptors. (The closest sensitive receptor would be approximately 855 feet south of the Airport.) Therefore, neither the Proposed Project nor Alternative 1 would expose sensitive receptors to substantial pollutant concentrations; the impacts would be less than significant under Threshold 4.2-4.*

4.2.8 CUMULATIVE IMPACTS

For informational purposes, this analysis considers four related projects at the Airport to assess cumulative impacts. These related projects are described in Section 4.0 of this Program EIR. The four related projects include the 2014 Settlement Agreement, Paularino Gate Relocation, Taxiway B rehabilitation, and the Wickland Pipeline Project. The cumulative analysis addresses the potential cumulative impacts from the construction and operations of the GAIP and these related projects.

As discussed above (see Threshold 4.2-3), the cumulative impacts analysis for criteria air pollutants is based on guidance provided by the SCAQMD that projects exceeding project-specific significance thresholds are considered by the SCAQMD to be cumulatively considerable. Conversely, projects not exceeding project-specific thresholds are generally not considered cumulatively significant (see discussion under Threshold 4.2-3) (SCAQMD 2003). Therefore, following this guidance, the GAIP (Proposed Project and Alternative 1) would not have a cumulatively considerable contribution to any cumulative air quality impacts. Specifically, the GAIP's construction-related emissions would be below SCAQMD thresholds with implementation of MM AQ-1, and the GAIP's operational-related emissions would not exceed SCAQMD thresholds.

To further supplement the evaluation, the analysis considers the construction emissions for the related projects. The Paularino Gate Relocation, Taxiway B Rehabilitation, and the Wickland Pipeline Project would not be under construction at the same time as the GAIP improvements. There would not be an instance where construction emissions from each project would occur at the same time, and there are no cumulative construction emissions.[6] Therefore, the Project would not have a cumulatively considerable contribution to any cumulative construction-related air quality impacts.

The analysis also further evaluates the operational emissions of the related projects. The 2014 Settlement Agreement Amendment evaluates the potential increase in commercial flight activity. Based on that analysis, the operational NO_x and PM_{10} emissions were above the significance thresholds. The Paularino Gate Relocation and Taxiway B rehabilitation projects do not lead to increases in operational emissions because these projects do not change the function or usage of the Airport. The Wickland Pipeline project provides for fuel delivery via a pipeline and additional storage capacity of approximately 3 million gallons of Jet-A fuel. Once completed (estimated by the end of 2018), this project would reduce the criterial pollutant emissions associated with fuel delivery. Based on the operational changes from these related projects, there is a cumulatively significant impact for NO_x and PM_{10} emissions. However, based on the analysis of the GAIP (Proposed Project and Alternative 1), the GAIP does not have a cumulatively considerable contribution to this cumulative impact.

Similarly, the GAIP does not have a cumulatively considerable contribution to health risk impacts. As discussed above (see Threshold 4.2-4), the Project has a less than significant impact relative to health risk significance thresholds, and therefore would not have a cumulatively considerable contribution to health risk. The 2014 Settlement Agreement Amendment Health Risk Assessment prepared for Final EIR 617 demonstrates that the maximum estimated

[6] Note that the 2014 Settlement Agreement did not include construction activities.

incremental risk (cancer, chronic non-cancer, and acute non-cancer risks) associated with the 2014 Settlement Agreement amendment were all substantially below the SCAQMD established thresholds, except for the acute non-cancer risk for workers.[7] The Paularino Gate Relocation, Taxiway rehabilitation, and the Wickland Pipeline Project were less than significant for health risk impacts. The background health risk, however, is significant. SCAQMD has conducted several phases of the Multiple Air Toxics Exposure Study (MATES) to characterize health risks potentially posed by TACs in the Southern California Air Basin. In May 2015, SCAQMD released the final MATES-IV report[8], which concludes that that cancer risk in the basin has decreased 65% between the study periods for MATES-III and MATES-IV. The report further concludes that, while DPM exposure has decreased by approximately 70 percent, DPM still dominates the overall cancer risk from air toxics; and the highest risks are seen to occur near ports and transportation corridors. An interactive map showing model-calculated cancer risks[9], based on MATES-IV, estimated that TAC-related cancer risk in the Project area ranges from 748 to 887 in a million. Based on this SCAQMD study, the health risk in the area is cumulatively significant. However, based on the evaluation of the GAIP (Proposed Project and Alternative 1) and SCAQMD methodology, the project does not have a cumulatively considerable contribution to this cumulative impact.

4.2.9 MITIGATION PROGRAM

Minimization Measures

Although a significant VOC impact resulting from construction activities was not identified, Minimization Measure (MN) AQ-1 is recommended to further reduce the VOC emissions levels during construction.[10] This measure exceeds Rule 1113 (RR AQ-2) requirements for traffic coatings. Similarly, MN AQ-2 would further reduce the emissions associated with operations. MN GHG-2, provided in Section 4.4, Greenhouse Gas Emissions, identifies that the general aviation lease agreements will require compliance with the provisions of the *John Wayne Airport Climate Action Plan* ("CAP"). Implementation of the CAP measures would also serve to reduce Airport-related air quality emissions, including criteria pollutants.

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7 For example, the SCAQMD threshold identifies a significant project impact when the chronic and acute hazard index is ≥ 1.0 Hazard Index. The chronic non-cancer risk values for the 2014 Settlement Agreement Amendment are below 0.1 for all categories, which is less than a tenth of the threshold. For sensitive populations, the 2014 Settlement Agreement Amendment's maximum hazard index is 0.031. For acute non-cancer, the 2014 Settlement Agreement Amendment's maximum estimated hazard index for residential receptors is 0.53 and sensitive receptors is 0.60, again, substantially below the SCAQMD threshold. A summary of the quantified findings is presented in Table 4.1-23 of Final EIR 617.

8 SCAQMD. 2015. MATES IV Final Report. Available at: http://www.aqmd.gov/home/air-quality/air-quality-studies/health-studies/mates-iv. Accessed: June, 2018.

9 SCAQMD. 2015. "Multiple Air Toxics Exposure Study in the South Coast Air Basin (MATES-IV)." MATES IV Interactive Carcinogenicity Map. Available at: https://scaqmd-online.maps.arcgis.com/apps/webappviewer/index.html?id=470c30bc6daf4ef6a43f0082973ff45f. Accessed: June, 2018.

10 As defined in Section 4.0, a minimization measure is a condition proposed to reduce an adverse effect of the Project even when that effect does not result in a significant impact.

MN AQ-1 JWA shall require architectural coatings applied to the East and West Access Roads be low VOC coatings.[11] Specifically, JWA shall require the use of a paint for markings with less than 50 grams of VOC emissions per liter of paint.

MN AQ-2 General Aviation FBOs shall employ Zero Emission Vehicle ("ZEV") GSE where available (e.g. tugs, water carts, lavatory carts, other ramp service equipment/vehicles) for 90 percent or greater of the GSE operating hours. Where ZEVs are not available, vehicles shall meet Ultra Low Emission Vehicle ("ULEV") requirements. Where ULEVs are not available, and only diesel fuel engine trucks are available, the diesel-fueled truck shall comply with the On-Road Heavy-Duty Diesel Vehicles (In-Use) Regulation.

FBOs shall maintain monthly records regarding GSE type, make, model, year, fuel type, horsepower (if non-electric), and hours in-use. Monthly records are subject to audit and verification by JWA. These records shall be provided to JWA annually in June.

Mitigation Measures

MM AQ-1 JWA shall require heavy-duty, off-road, diesel-powered construction equipment to meet or exceed the USEPA's Tier 4 off-road emissions engine standards during Airport construction in order to reduce construction-related NOx emissions.

4.2.10 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Mitigation measures would reduce the potentially significant NO_X construction-related impact to less than significant. Mitigation is not required for operational-related emissions. Therefore, with implementation of MM AQ-1, construction and long-term operational impacts would be less than significant for both the Proposed Project and Alternative 1. The GAIP (Proposed Project and Alternative 1) would also not substantially contribute to a cumulative air quality impacts based on SCAQMD guidance and the additional analysis of related projects. Therefore, the GAIP's cumulative impact would be less than significant.

4.2.11 REFERENCES

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[11] Sherwin Williams, *Pro-Park Waterborne Traffic Marking Paint B97 Series*, July 2017. Available on-line: https://www.sherwin-williams.com/document/PDS/en/035777081228/ Accessed January 2018.

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