4. ENVIRONMENTAL IMPACT ANALYSIS
B. AIR QUALITY

INTRODUCTION

This section addresses air quality emissions associated with construction and operation of the proposed project and the potential for impacts on global climate change. The analysis also addresses project consistency with applicable federal, state, regional, and local plans and regulations.

Analysis in this section is based on the *Air Quality Impact Assessment Technical Report* prepared by PCR Services Corp. for the proposed project (May 2012) and provided in **Appendix B** of this Draft EIR. The City is seeking a permit to construct and operate a new combustion turbine, Unit GT-5, using one of two possible power-generating equipment configurations from different turbine manufacturers. As part of the Clean Air Act permitting process, the project is subject to New Source Review (NSR) program requirements. It should be noted that the project is not subject to Prevention of Significant Deterioration (PSD) requirements for criteria pollutants. Detailed explanation of PSD exemption is described later in the document. Oversight of compliance with both programs has been delegated to the South Coast Air Quality Management District (SCAQMD). The analysis prepared for these permits is incorporated into this technical report and Draft EIR section.

1. ENVIRONMENTAL SETTING

a. Regulatory Framework

Air quality within the City of Pasadena is addressed through the efforts of various federal, state, regional, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, regulations, planning, policy-making, education, and a variety of programs. The agencies responsible for improving the air quality within the air basins are discussed below.

(1) U.S. Environmental Protection Agency

(a) Clean Air Act

The Clean Air Act (CAA) of 1970 and the CAA Amendments of 1971 required the USEPA to establish National Ambient Air Quality Standards (NAAQS), with states retaining the option to adopt more stringent standards or to include other specific pollutants. These standards are the levels of air quality considered safe, with an adequate margin of safety, to protect the public health and welfare. They are designed to protect those "sensitive receptors" most susceptible to further respiratory distress such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed.

The CAA (and its subsequent amendments) requires each State to prepare an air quality control plan referred to as the State Implementation Plan (SIP). The CAA Amendments dictate that states containing

areas violating the NAAQS revise their SIPs to include extra control measures to reduce air pollution. The SIP includes strategies and control measures to attain the NAAQS by deadlines established by the CAA. The SIP is periodically modified to reflect the latest emissions inventories, plans, and rules and regulations of air basins as reported by the agencies with jurisdiction over them. The USEPA has the responsibility to review all SIPs to determine if they conform to the requirements of the CAA. Title I (Nonattainment Provisions) and Title II (Mobile Source Provisions) of the CAA apply to the development and operations of the proposed project. Title I provisions were established with the goal of attaining the NAAQS for the following criteria pollutants: O_3; NO_2; SO_2; PM_{10}; CO; and Pb. **Table 4.B-1,** *Ambient Air Quality Standards*, shows the NAAQS currently in effect for each criteria pollutant. The NAAQS were amended in July 1997 to include an 8-hour standard for O_3 and to adopt a NAAQS for $PM_{2.5}$.

The Basin fails to meet national standards for O_3 (for both the 1-hour and 8-hour, standard), PM_{10} and $PM_{2.5}$, and therefore is considered a federal "non-attainment" area for these pollutants. The CAA sets certain deadlines for meeting the NAAQS within the Basin including: 1-hour O_3 by the year 2010; 8-hour O_3 by the year 2021; and PM_{10} by the year 2006. Nonattainment designations are categorized into seven levels of severity: basic; marginal; moderate; serious; severe-15;[1] severe-17; and extreme. **Table 4.B-2**, *South Coast Air Basin Attainment Status*, lists the criteria pollutants and their relative attainment status.

Title II of the CAA pertains to mobile sources, such as cars, trucks, buses, and planes. Reformulated gasoline, automobile pollution control devices, and vapor recovery nozzles on gas pumps are a few of the mechanisms the USEPA uses to regulate mobile air emission sources. The provisions of Title II have resulted in tailpipe emission standards for vehicles, which have strengthened in recent years to improve air quality. For example, the standards for NO_X emissions have lowered substantially and the specification requirements for cleaner burning gasoline are more stringent.

(b) New Source Performance Standards (NSPS)

The proposed project will be subject to Federal New Source Performance Standards (NSPS) Subpart Db (Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units) which establishes standards for PM and NO_X emissions.[2]

(2) State Agencies and Regulations

(a) California Clean Air Act

The California Clean Air Act (CCAA), signed into law in 1988, requires all areas of the State to achieve and maintain the California Ambient Air Quality Standards (CAAQS) by the earliest practical date. The CAAQS incorporate additional standards for most of the criteria pollutants and include set standards for other pollutants recognized by the State. In general, the California standards are more health protective than NAAQS. California has also set standards for $PM_{2.5}$, sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. The Basin is in compliance with the California standards for sulfates, hydrogen sulfide,

[1] *The "-15" and "-17" designations reflect the number of years within which attainment must be achieved.*

[2] *Federal Code of Regulations, Title 40, Part 60. See http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?tpl=/ecfrbrowse/Title40/40tab_02.tpl (accessed January, 2012).*

Table 4.B-1

Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards (CAAQS)[a]		Federal Standards (NAAQS)[b]		
		Concentration[c]	Method[d]	Primary[c,e]	Secondary[c,f]	Method[g]
Ozone (O^3)	1 Hour	0.09 ppm (180 µg/m³)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m³)		0.075 ppm (147 µg/m³)		
Respirable Particulate Matter (PM_{10})	24 Hour	50 µg/m³	Gravimetric or Beta Attenuation	150 µg/m³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m³		—		
Fine Particulate Matter ($PM_{2.5}$)	24 Hour	No Separate State Standard		35 µg/m³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m³	Gravimetric or Beta Attenuation	15 µg/m³		
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10mg/m³)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m³)	None	Non-Dispersive Infrared Photometry (NDIR)
	1 Hour	20 ppm (23 mg/m³)		35 ppm (40 mg/m³)		
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m³)		—	—	—
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (56 µg/m³)	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m³)[h]	Same as Primary Standard	Gas Phase Chemiluminescence
	1 Hour	0.18 ppm (338 µg/m³)		0.100 ppm (188 µg/m3)[h]		
Sulfur Dioxide (SO_2)			Ultraviolet Fluorescence			Ultraviolet Fluorescence; Spectrophotometry (Pararosaniline Method)[i]
	24 Hour	0.04 ppm (105 µg/m³)		—	—	
	3 Hour	—		—	0.5 ppm (1300 µg/m³)	
	1 Hour	0.25 ppm (655 µg/m³)		75 ppb (196 µg /m3)[i]	—	—
Lead (Pb)[j]	30 Day Average	1.5 µg/m³	Atomic Absorption	—	—	—
	Calendar Quarter	—		1.5 µg/m³	Same as Primary Standard	High Volume Sampler and Atomic Absorption
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per kilometer — visibility of ten miles or more (0.07 — 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		**No Federal Standards**		
Sulfates (SO_4)	24 Hour	25 µg/m³	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m³)	Ultraviolet Fluorescence			
Vinyl Chloride[j]	24 Hour	0.01 ppm (26 µg/m³)	Gas Chromatography			

a California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter (PM_{10}, and $PM_{2.5}$) and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

b National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight hour concentration in a year, averaged over three years, is equal to or

Table 4.B-1 (Continued)

Ambient Air Quality Standards

less than the standard. For PM_{10}, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than one. For $PM_{2.5}$, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact USEPA for further clarification and current federal policies.

c *Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.*

d *Any equivalent procedure which can be shown to the satisfaction of the CARB to give equivalent results at or near the level of the air quality standard may be used.*

e *National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.*

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

g *Reference method as described by the USEPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the USEPA.*

h *To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010). To directly compare the national standards to the California standards the units can be converted from ppb to ppm. In this case, the national standards of 53 ppb and 100 ppb are identical to 0.053 ppm and 0.100 ppm, respectively. USEPA standards are in units of parts per billion (ppb). California standards are in units of parts per million.*

i *On June 2, 2010, the USEPA established a new 1-hour SO_2 standard, effective August 23, 2010, which is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. USEPA also proposed a new automated Federal Reference Method (FRM) using ultraviolet technology, but will retain the older pararosaniline methods until the new FRM have adequately permeated State monitoring networks. The USEPA also revoked both the existing 24-hour SO_2 standard of 0.14 ppm and the annual primary SO_2 standard of 0.030 ppm, effective August 23, 2010.*

The secondary SO_2 standard was not revised at that time; however, the secondary standard is undergoing a separate review by EPA. Note that the new standard is in units of parts per billion (ppb). To directly compare the new primary national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

j *The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.*

Source: CARB, USEPA, 2010.

and vinyl chloride, but does not meet the California standard for visibility reducing particles. Table 4.B-1, above details the current NAAQS and CAAQS, and Table 4.B-2, above, provides the Basin's attainment status with respect to federal and State standards.

(b) California Air Resources Board (CARB)

The California Air Resources Board, a part of the California EPA (CalEPA), is responsible for the coordination and administration of both federal and state air pollution control programs within California. In this capacity, CARB conducts research, sets state ambient air quality standards (CAAQS), compiles emission inventories, develops suggested control measures, and provides oversight of local programs. CARB establishes emissions standards for motor vehicles sold in California, consumer products (such as hairspray, aerosol paints, and barbecue lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions. CARB has primary responsibility for the development of the SIPs, and works closely with the federal government and the local air districts.

(i) Toxic Air Contaminant (TACs) Regulations

The CARB's statewide comprehensive air toxics program was established in the early 1980's. The Toxic Air Contaminant Identification and Control Act (AB 1807) created California's program to reduce exposure to air

Table 4.B-2

South Coast Air Basin Attainment Status

Pollutant	National Standards	California Standards
Ozone (1-hour standard)	N/A [a]	Non-attainment
Ozone (8-hour standard)	Extreme Non-attainment	N/A
Carbon Monoxide	Attainment [b]	Attainment
Nitrogen Dioxide	Attainment	Non-attainment
Sulfur Dioxide	Attainment	Attainment
PM_{10} (24-hour standard)	Serious Non-attainment	Non-attainment
PM_{10} (annual standard)	N/A [c]	Non-attainment
$PM_{2.5}$	Serious Non-attainment	Non-attainment
Lead	Attainment	Non-attainment [d]
Visibility Reducing Particles	N/A	Unclassified
Sulfates	N/A	Attainment
Hydrogen Sulfide	N/A	Unclassified
Vinyl Chloride	N/A	N/A [e]

N/A = not applicable

[a] *The NAAQS for 1-hour ozone was revoked on June 15, 2005 for all areas except Early Action Compact areas.*

[b] *The Basin was officially reclassified as in attainment for carbon monoxide by the USEPA on June 11, 2007. "Approval and Promulgation of Implementation Plans and Designation of Areas for Air Quality Planning Purposes: California, Final Rule." Federal Register 72 (11 May 2007):26718-26721.*

[c] *The annual NAAQS for PM_{10} was revoked on September 21, 2006.*

[d] *The Los Angeles County portion of the Basin is designated as non-attainment for lead due to localized lead emissions from an industrial lead-acid battery recycling facility in the City of Commerce..*

[e] *Although there is a State ambient air quality standard for vinyl chloride, the CARB does not monitor or make status designations for this pollutant, which is subject to source-specific toxic air contaminant control measures.*

Source: USEPA Region 9 and California Air Resources Board.

toxics. TACs are airborne substances that are capable of causing chronic (i.e., of long duration) and acute (i.e., severe but of short duration) adverse effects on human health. They include both organic and inorganic chemical substances that may be emitted from a variety of common sources including gasoline stations, motor vehicles, dry cleaners, industrial operations, painting operations, and research and teaching facilities.

In 1993, the AB 1807 program was amended to include the identification and control of TACs (AB 2728). Specifically, AB 2728 required the CARB to identify 188 hazardous air pollutants (HAPs) as TACs. Major sources of specific HAPs are subject to the requirements of the National Emissions Standards for Hazardous Air Pollutants (NESHAPS) Program and require Title V permitting which requires implementation of Maximum Achievable Control Technologies (MACTs) to reduce emissions of HAPs.

Lifetime cancer risk is defined as the increased chance of contracting cancer over a 70-year period as a result of exposure to a toxic substance or substances. It is the product of the estimated daily exposure of each suspected carcinogen by its respective cancer unit risk. The end result represents a worst-case estimate of cancer risk. The CARB has produced a series of estimated inhalation cancer risk maps based on modeled levels of outdoor composite toxic pollutant levels (CARB, 2010). The 2010 Cancer Inhalation Risk map

indicates that the City of Pasadena is exposed to an inhalation cancer risk of 250 – 500 persons per million. These risk maps depict inhalation cancer risk due to modeled outdoor toxic pollutant levels, and do not account for cancer risk due to other types of exposure. The largest contributors to inhalation cancer risk are diesel engines.

In September 1987, the California Legislature established the AB 2588 air toxics "Hot Spots" program. It requires facilities to report their air toxics emissions, ascertain health risks, and to notify nearby residents of significant risks. The SCAQMD has determined that the significance criterion for cancer health risks is a ten in million increase in the chance of developing cancer. The significance of non-cancer (acute and chronic) risks is evaluated in terms of hazard indices (HI) for different endpoints. The SCAQMD threshold for non – cancer risk for both acute and chronic HI is 1.0. In September 1992, the "Hot Spots" Act was amended by Senate Bill 1731 which required facilities that pose a significant health risk to the community to reduce their risk through a risk management plan. In 2000, the CARB adopted a diesel risk reduction plan to reduce diesel particulate matter emissions and the associated health risk. The goal of the plan is to reduce diesel particulate matter emissions and the associated health risk by 75 percent in 2010 and by 85 percent by 2020.

(ii) California Air Resources Board Air Toxics Control Measure (ATCM)

In 2004, CARB adopted a control measure to limit commercial heavy duty diesel motor vehicle idling in order to reduce public exposure to diesel particulate matter (DPM) and other air contaminants.[3] The measure applies to diesel-fueled commercial vehicles with gross vehicle weight ratings greater than 10,000 pounds that are licensed to operate on highways, regardless of where they are registered. In general, it prohibits idling for more than 5 minutes at any location.

In addition to limiting exhaust from idling trucks, CARB promulgated emission standards for off-road diesel construction equipment such as bulldozers, loaders, backhoes and forklifts, as well as many other self-propelled off-road diesel vehicles. A CARB regulation that became effective on June 15, 2008, aims to reduce emissions by installation of diesel soot filters and encouraging the replacement of older, dirtier engines with newer emission controlled models.[4] A prohibition against acquiring certain vehicles began on March 1, 2009, and a reporting requirement started on April 1, 2009. Implementation of some provisions is staggered based on fleet size, with the largest operators to begin compliance in 2010. By 2020, CARB estimates that DPM will be reduced by 74 percent and smog forming NO_X (another important pollutant emitted from diesel engines) by 32 percent, compared to what emissions would be without the regulation. In January 2010, the Associated General Contractors of America filed a petitioned requesting CARB to adopt an emergency amendment to delay the fleet average target dates of this regulation for a period of two years. Consequently, the following relief was granted: CARB will "not take any enforcement action for noncompliance with the regulation's March 1, 2010 emission standards or other emission related requirements before it receives authorization from U.S. EPA."[5]

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[3] *Calif. Code of Regulations, Title 13, Sec. 2485. See http://www.arb.ca.gov/regact/idling/idling.htm (accessed July 2008).*

[4] *Calif. Code of Regulations, Title 13, Secs. 2449, 2449.1, 2449.2 and 2449.3.*

[5] *California Regulatory Notice Register, February 2010. http://www.oal.ca.gov/res/docs/pdf/notice/9z-2010.pdf (accessed April 2010).*

(3) Regional Agencies and Regulations

(a) Southern California Association of Governments (SCAG)

SCAG is a council of governments for Los Angeles, Orange, Riverside, San Bernardino, Imperial, and Ventura Counties. It is a regional planning agency and serves as a forum for regional issues relating to transportation, the economy and community development, and the environment. SCAG is the federally designated metropolitan planning organization (MPO) for the majority of the southern California region and is the largest MPO in the nation. With regard to air quality planning, SCAG prepares the Regional Transportation Plan (RTP) and Regional Transportation Improvement Program (RTIP), which address regional development and growth forecasts and form the basis for the land use and transportation control portions of the AQMP and are utilized in the preparation of the air quality forecasts and consistency analysis included in the AQMP. The RTP, RTIP, and AQMP are based on project ions originating within local jurisdictions.

Although SCAG is not an air quality management agency, it is responsible for developing transportation, land use, and energy conservation measures that affect air quality. SCAG's Regional Comprehensive Plan (RCP) provides growth forecasts that are used in the development of air quality–related land use and transportation control strategies by the South Coast Air Quality Management District. The RCP is a framework for decision-making for local governments, assisting them in meeting federal and state mandates for growth management, mobility, and environmental standards, while maintaining consistency with regional goals regarding growth and changes through the year 2015, and beyond. Policies within the RCP include consideration of air quality, land use, transportation, and economic relationships by all levels of government.

On April 4, 2012, the Regional Council of SCAG adopted the 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). Using growth forecasts and economic trends, the RTP provides a vision for transportation throughout the region for the next 20 years. It considers the role of transportation in the broader context of economic, environmental, and quality-of-life goals for the future, identifying regional transportation strategies to address mobility needs. The SCS is a newly required element of the RTP, which integrates land use and transportation strategies to achieve CARB emissions reduction targets. The inclusion of the SCS is required by Senate Bill 375 (SB 375) which was enacted to reduce greenhouse gas emissions from automobiles and light trucks through integrated transportation, land use, housing and environmental planning. The RTP/SCS successfully achieves and exceeds the greenhouse gas emission-reduction targets set by ARB by achieving a 9% reduction by 2020 and 16% reduction by 2035 compared to the 2005 level on a per capita basis. This RTP/SCS also meets criteria pollutant emission budgets set by the EPA.

The 2012–2035 RTP/SCS includes a strong commitment to reduce emissions from transportation sources to comply with SB 375, improve public health, and meet the NAAQS as set forth by the federal Clean Air Act. Even with ongoing aggressive control strategies, ever more stringent national O_3 standards require further NOx emission reductions in the SCAG region. In the South Coast Air Basin (SoCAB), for example, it is estimated that NO_X emissions will need to be reduced by approximately two-thirds in 2023 and three-quarters in 2030. Most sources of NO_X emissions, cars and factories, are already controlled by over 90%. The level of emission reduction required is so significant that 2030 emissions forecasted from just three sources—ships, trains, and aircraft—would lead to O_3 levels near the federal standard. To accomplish the reduction required to meet O_3 standards, the 2012–2035 RTP/SCS contains a regional commitment for the

broad deployment of zero- and near-zero emission transportation technologies in the 2023–2035 time frame and clear steps to move toward this objective.

(b) South Coast Air Quality Management District (SCAQMD)

As indicated previously, the City of Pasadena is located within the SoCAB. The SCAQMD has jurisdiction over an area of approximately 10,743 square miles. This area includes all of Orange County, Los Angeles County except for the Antelope Valley, the non-desert portion of western San Bernardino County, and the western and Coachella Valley portions of Riverside County.

The SCAQMD is the agency principally responsible for comprehensive air pollution control in the SoCAB. SCAQMD is directly responsible for reducing emissions from stationary (area and point) sources. The SCAQMD develops rules and regulations, establishes permitting requirements, inspects emissions sources, and enforces such measures though educational programs or fines, when necessary.

(i) Rules and Regulations

The proposed project is subject to the following South Coast Air Quality Management District rules and regulations:

Regulation II – Permits: This regulation sets forth the regulatory framework of the application for and issuance of construction and operation permits for new, altered and existing equipment.

- **Rule 202 – Temporary Permit to Operate:** This rule states that any new equipment that has been issued a Permit to Construct (PTC) shall be allowed to use that PTC as a temporary Permit to Operate (PTO) upon notification to the Air Pollution Control Officer (APCO). This project is subject to a PTC, so once the PTC is awarded, the project will be in compliance with Rule 202.
- **Rule 203 – Permit to Operate:** This rule prohibits the use of any equipment that may emit air contaminants or control the emission of air contaminants, without first obtaining a PTO except as provided in Rule 202. This project is subject to a PTO, so once it is awarded, the project will be in compliance with Rule 203.
- **Rule 217 – Provisions for Sampling and Testing:** The Executive Officer (EO) may require the applicant to provide and maintain facilities necessary for sampling and testing. The EO will inform the applicant of the need for testing ports, platforms and utilities. The proposed project will be required to provide sampling and testing results as a condition of the PTC/PTO and, therefore, will be in compliance with Rule 217.
- **Rule 218 – Continuous Emission Monitoring:** This rule describes the installation, QA/QC and reporting requirements for all sampling interfaces, analyzers and data acquisition systems used to continuously determine the concentration or mass emission of an emission source. However, this rule does not apply to the CEMS required for NO_X monitoring under the Regional Clean Air Incentives Market (RECLAIM) (Regulation XX). The proposed project will be required to have continuous emission monitoring as part of the PTC/PTO, and therefore, will be in compliance with Rule 218.

Regulation IV – Prohibitions: This regulation sets forth the restrictions for visible emissions, odor nuisance, fugitive dust, various air emissions, fuel contaminants, start-up/shutdown exemptions and breakdown events.

- **Rule 402 – Nuisance:** This rule restricts the discharge of any contaminant in quantities that cause or have a natural ability to cause injury, damage, nuisance or annoyance to businesses, property or the public. The proposed project does not plan on discharging any contaminants in quantities to cause injury to the public or property. Project-specific modeling was conducted to determine the health risk of TACs emitted from the project, see criterion b), below for a thorough discussion. The project will comply with Rule 402.
- **Rule 403 – Fugitive Dust:** This rule requires that the applicant prevent, reduce or mitigate fugitive dust emissions from the project site. Rule 403 restricts visible fugitive dust to the project property line, restricts the net PM_{10} emissions to less than 50 ug/m3 and restricts the tracking out of bulk materials onto public roads. Additionally, the applicant must utilize one or more of the best available control measures (identified in the tables within the rule). Mitigation measures may include adding freeboard to haul vehicles, covering loose material on haul vehicles, watering, using chemical stabilizers and/or ceasing all activities. Finally, a contingency plan may be required if so determined by the USEPA. The proposed project will comply with Rule 403.
- **Rule 408 – Circumvention:** This rule prohibits the use of equipment that conceals emissions without reducing emissions, except in cases where the only violation involved is of Section 48700 of the Health and Safety Code or District Rule 402. The project will comply with Rule 408.
- **Rule 409 – Combustion Contaminants:** This rule restricts the discharge of contaminants from the combustion of fuel to 0.23 grams per cubic meter of gas, calculated to 12% CO2, averaged over 15 minutes. The project will comply with Rule 409.
- **Rule 431.1 - Sulfur Content of Gaseous Fuels: Rule 431.1 - Sulfur Content of Gaseous Fuels:** This rule limits the sulfur content of fuels for combustion equipment located at an electric utility generating facility. The project will submit monthly reports containing data as specified in Rule 431.1. Equipment subject to Rule 431.2 are expected to comply with the emissions limits of Rule 407. The project will comply with Rule 431.1.
- **Rule 475 – Electric Power Generating Equipment:** This rule limits combustion contaminants (PM_{10}) from electric power generating equipment to 11 pounds per hour and 23 milligrams per cubic meter @ 3% O_2 (averaging time subject to Executive Officer decision). The project will comply with Rule 475.

Regulation IX – Standards of Performance for New Stationary Sources: Regulation IX incorporates provisions of Part 60, Chapter I, Title 40, of the Code of Federal Regulations (CFR) and is applicable to all new, modified or reconstructed sources of air pollution. Sections of this regulation apply to electric utility steam generators (Subpart Da) and stationary gas turbines (Subpart GG). These subparts establish limits of particulate matter, SO_2 and NO_2 emissions from the facility as well as monitoring and test method requirements. Project-specific air dispersion modeling was conducted for the PM, SO_2 and NO_2. The project will meet requirements of Regulation IX and, therefore, will be in compliance with Regulation IX.

Regulation XIII – New Source Review: This regulation sets forth the pre-construction review requirements for new, modified or relocated facilities to ensure that these facilities do not interfere with

progress in attainment of the national ambient air quality standards and that future economic growth in the SCAQMD is not unnecessarily restricted. This regulation limits the emissions of non-attainment contaminants and their precursors as well as ozone depleting compounds and ammonia by requiring the use of Best Available Control Technologies (BACT). However, this regulation does not apply to NO_X or SO_X emissions from certain sources, which are regulated by Regulation XX (RECLAIM).

- **Rule 1303 – Requirements:** This rule specifies the application of BACT, modeling, offsetting and offset ratios to permitted sources within the SCAQMD. The proposed project is exempt from Rule 1303 due to rule 1304, below.
- **Rule 1304 – Exemptions:** This rule identifies the conditions under which a facility may be exempt from the application of Rule 1303. Section (a) 2 specifically exempts utility steam boiler replacements with other advanced gas turbines (or other specified technologies). The only proviso being that the new technology is compliant with Rule 1135 (if applicable) or Regulation XX rules (see RECLAIM below) and that the new technology not increase the overall capacity at the facility. If there is a capacity increase the owners are responsible for mitigating the emissions associated with that increased capacity. The proposed project does not increase the overall capacity of the facility and is replacing an older turbine, with a cleaner more efficient advanced natural gas turbine. Therefore, the project falls under Rule 1304, and, therefore, is exempt from the application of Rule 1303, above.
- **Rule 1306 – Emission Calculations:** This rule defines the applicability of rules 1301 (b) and 1303 as exempted by rule 1304. This rule explains how emission increases or decreases are valued how many offsets are required and how emission reduction credits is valued. Since the proposed project is exempt from Rule 1303, it is also exempt from Rule 1306.

Regulation XVII – Prevention of Significant Deterioration: This regulation sets forth the pre-construction requirement for stationary sources to ensure that the air quality in clean air areas does not significantly deteriorate while maintaining a margin for future industrial growth. This regulation establishes maximum allowable increases over ambient baseline concentrations for each pollutant. Criteria pollutant emissions resulting from the project are less than the PSD increment. Therefore, the project is exempt from XVII requirements with regard to criteria pollutants. The proposed project is exempt from the SO_X RECLAIM program (Rule 2011) because it uses natural gas exclusively (per Rule 2001). However, it will be a NO_X RECLAIM project and therefore subject to the rules of RECLAIM for NO_X emissions.. Since the project is not subject to Regulation XVII as part of the PTO/PTC with respect to criteria pollutants, it will be in compliance with Regulation XVII. Criterion b), below, provides a discussion of project specific emissions.

Regulation XX – Regional Clean Air Incentives Market (RECLAIM): The Regional Clean Air Incentives Market (RECLAIM) program is designed to allow facilities flexibility in achieving emission reduction requirements for NO_X and SO_X through controls, equipment modifications, reformulated products, operational changes, shutdowns, other reasonable mitigation measures, or the purchase of excess emission reductions. The RECLAIM program establishes an initial allocation (beginning in 1994) and an ending allocation (to be attained by the year 2003) for each facility within the program (Rule 2002). Each facility then reduces their allocation annually on a straight line from the initial to the ending. The RECLAIM program supercedes other specified district rules where there are conflicts. As a result, the RECLAIM program has its own rules for permitting, reporting, monitoring (including CEM), record keeping, variances, breakdowns and the New Source Review program, which incorporates BACT requirements (Rules 2004, 2005, 2006 and 2012). RECLAIM also has its own banking rule, RECLAIM Trading Credits (RTCs), which is

established in Rule 2007. The proposed project is exempt from the SO_X RECLAIM program (Rule 2011) because it uses natural gas exclusively (per Rule 2001). However, it will be a NO_X RECLAIM project and therefore subject to the rules of RECLAIM for NO_X emissions. The PTC/PTO will require compliance with Regulation XX, therefore, once the PTC/PTO is approved, the project will be in compliance with Regulation XX.

(ii) Air Quality Management Plan

SCAQMD is responsible for demonstrating regional compliance with ambient air quality standards but has limit indirect involvement in reducing emissions from fugitive, mobile, and natural sources. To that end, the SCAQMD works cooperatively with CARB, SCAG, county transportation commissions, local governments, and other federal and state government agencies. It has responded to this requirement by preparing a series of Air Quality Management Plans (AQMPs). The most recent of these was adopted by the Governing Board of SCAQMD on June 1, 2007. This AQMP, referred to as the 2007 AQMP, was prepared to comply with the federal and state Clean Air Acts and amendments, to accommodate growth, to reduce the high pollutant levels in the basins, to meet federal and state ambient air quality standards, and to minimize the fiscal impact that pollution control measures have on the local economy. It identifies the control measures that will be implemented to reduce major sources of pollutants. These planning efforts have substantially decreased the population's exposure to unhealthful levels of pollutants, even while substantial population growth has occurred within its jurisdictional boundaries.

The 2007 AQMP relies on a comprehensive and integrated control approach aimed at achieving the $PM_{2.5}$ standard by 2015 through implementation of short- and mid-term control measures and achieving the 8-hour ozone standard by 2024 based on implementation of additional long-term measures. 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 2007 AQMP consist of four components: 1) the District's Stationary and Mobile Source Control Measures; 2) CARB's Proposed State Strategy; 3) the District Staff's Proposed Policy Options to Supplement CARB's Control Strategy; and 4) Regional Transportation Strategy and Control Measures provided by SCAG. The Plan includes 31 stationary and 30 mobile source measures. In general, the District's control strategy for stationary and mobile sources is based on the following approaches: 1) facility modernization; 2) energy efficiency and conservation; 3) good management practices; 4) market incentives/compliance flexibility; and 5) emission growth management.

Several SCAQMD rules adopted to implement portions of the AQMP may apply to construction or operation of the project. For example, SCAQMD Rule 403 requires the implementation of best available fugitive dust control measures during active construction periods 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.

The SCAQMD requires new or modified sources of emissions in non-attainment areas to conduct New Source Review (NSR) prior to permitting, Regulation XIII. The purpose of the NSR is to allow continued industrial growth in non-attainment areas and, at the same time, ensure that new and modified sources do not aggravate existing air quality problems and/or negate emission reductions from other sources. Under NSR,

all existing and new stationary sources of emissions are required to conduct a Best Available Control Technology (BACT) analysis to evaluate the feasibility of implementing emission control devices. The goal is to achieve no net increases from new of modified permitted sources of non-attainment air contaminants or their precursors.

As mentioned previously, the project would result in criteria pollutant emissions below the PSD increment. Therefore, Regulation XVII, Prevention of Significant Deterioration, which sets forth pre-construction review requirements for stationary sources, does not apply to the proposed project with respect to criteria pollutants. Typically, the requirements of this Regulation must be followed in order to get a Permit to Construct and a Permit to Operate. The regulation outlines the use of BACT on new or modified sources, modeling to determine estimated emissions, and monitoring requirements.

The SCAQMD published a *CEQA Air Quality Handbook* (the Handbook) in November 1993 to provide local governments with guidance for analyzing and mitigating project -specific air quality impacts. The Handbook provides standards, methodologies, and procedures for conducting air quality analyses in EIRs and was used extensively in the preparation of this analysis. However, the SCAQMD is currently in the process of replacing the Handbook with the Air Quality Analysis Guidance Handbook. While this process is underway, the SCAQMD recommends that the lead agency avoid using the screening tables in the Handbook's Chapter 6, because the tables were derived using an obsolete version of CARB's mobile source emission factor inventory, and the trip generation characteristic of the land uses identified in these screening tables were based on the fifth edition of the ITE Trip Generation Manual, instead of the most current sixth edition. Additionally, the lead agency should avoid using the on-road mobile source emission factors in Table A9-5-J1 through A9-5-L in the Handbook. The SCAQMD instead recommends using other approved models to calculate emissions from land use project s, such as the California Emissions Estimator Model (CALEEMOD) model. To assist the lead agency, this analysis follows SCAQMD's recommendations.

In addition, the SCAQMD has published (in June 2003) a document called "Localized Significance Threshold Methodology" that is intended to provide voluntary guidance for lead agencies in analyzing localized air quality impacts from proposed projects.[6] In October 2006, the SCAQMD adopted additional guidance regarding $PM_{2.5}$ in a document called "Final – Methodology to Calculate Particulate Matter $PM_{2.5}$ and $PM_{2.5}$ Significance Thresholds."[7] These documents were also used in the preparation of this analysis.

The SCAQMD has also adopted land use planning guidelines in the May 2005 "Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning"[8] which, like the CARB Handbook, also considers impacts to sensitive receptors from facilities that emit TACs. SCAQMD's distance recommendations are the same as those provided by CARB (e.g., the same siting criteria for distribution centers and dry cleaning facilities). The SCAQMD's document introduces land use-related policies that rely on design and distance parameters to manage potential health risk. These guidelines are voluntary initiatives recommended for consideration by local planning agencies.

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[6] *See http://www.aqmd.gov/ceqa/handbook/LST/LST.html.*

[7] *See http://www.aqmd.gov/ceqa/handbook/pm2_5/pm2_5.html.*

[8] *See http://www.aqmd.gov/prdas/aqguide/aqguide.html.*

(c) City of Pasadena

City of Pasadena Zoning Code 17.35.050 limits parcels that abut South Fair Oaks Street south of Pico Street but do not abut a residential use to heights of no more than 56 feet. The proposed project includes construction of an approximate 125-foot tall stack, which would be comparable in height to existing stacks on-site. Pasadena Water and Power will apply for a variance from this development standard. The proposed project is otherwise consistent with its IG-SP-HL "56" zoning designation as well as the SP-2 General Plan Land Use designation.

(4) Sensitive Receptors

Sensitive receptors are populations that are more susceptible to the effects of air pollution than are the population at large. While the ambient air quality standards are designed to protect public health and are generally regarded as conservative for healthy adults, there is greater concern to protect adults who are ill or have long-term respiratory problems, and young children whose lungs are not fully developed. According to CARB, sensitive receptors include children less than 14 years of age, the elderly over 65 years of age, athletes, and people with cardiovascular and chronic respiratory diseases. The SCAQMD identify the following as locations that may contain a high concentration of sensitive receptors; long-term health care facilities, rehabilitation centers, convalescent centers, retirement homes, residences, schools, playgrounds, childcare centers, and athletic facilities.

The project vicinity includes a mix of industrial, commercial, office, residential, educational, and community uses. The nearest sensitive receptors to the project site are: single family residences approximately 64 meters to the west across Fair Oaks Avenue, multi-family residential approximately 130 meters to the south of the project site, and Blair High School approximately 197 meters to the east.

b. Existing Conditions

The SoCAB is surrounded by mountains trapping the air and its pollutants in the valleys or basins below. This area includes all of Orange County and the non-desert portions of Los Angeles, San Bernardino, and Riverside Counties. Bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east, the SoCAB is an area of high air pollution potential. The regional climate within the Basin is considered semi-arid and is characterized by warm summers, mild winters, infrequent seasonal rainfall, moderate daytime onshore breezes, and moderate humidity. Air quality within the Basin is influenced by a wide range of emissions sources—such as dense population centers, heavy vehicular traffic, and industry.

The annual average temperature varies throughout the Basin, ranging from the low to mid 60s to over 100 degrees during the summer, measured in Fahrenheit (°F). The City of Pasadena is located in the northern portion of the Basin. The annual average temperature in Pasadena is approximately 62°F, although temperatures can often exceed 90°F. Typically the hottest months are July and August, and the coldest months are December and January. The average annual rainfall is 20.3 inches and occurs between December and March (weatherreports.com, 2012).

The Basin experiences a persistent temperature inversion, which is characterized by increasing temperature with increasing altitude. This inversion limits the vertical dispersion of air contaminants, holding them

relatively near the ground. As the sun warms the ground and the lower air layer, the temperature of the lower air layer approaches the temperature of the base of the inversion (upper) layer until the inversion layer finally breaks, allowing vertical mixing with the lower layer. Aside from a persistent temperature inversion, the vertical dispersion of air contaminants in the Basin is also affected by wind conditions. The combination of stagnant wind conditions and low inversions produces the greatest pollutant concentrations. Conversely, on days of no inversion or high wind speeds, ambient air pollutant concentrations are the lowest. During periods of low inversions and low wind speeds, air pollutants generated in urbanized areas in the Basin are transported eastward, predominantly into Riverside and San Bernardino Counties. Santa Ana winds, which are strong and dry north or northeasterly winds that occur during the fall and winter months, disperse air contaminants differently through the Basin, generally resulting in worse air conditions in the western parts of the Basin. Santa Ana conditions tend to last for several days at a time.

SoCAB has very low average wind speeds; the dominant daily wind pattern is an onshore 8 to 12 mph during the day and offshore 3 to 5 mph winds during the night. These wind patterns are disrupted occasionally by winter storms or strong northeasterly Santa Ana winds from the mountains and deserts northeast of the SoCAB.

(1) Existing Regional Air Quality Emissions

Measurements of ambient concentrations of criteria pollutants are used by the USEPA and the CARB to assess and classify the air quality of each air basin, county, or, in some cases, a specific developed area. The classification is determined by comparing monitoring data with national and California air quality standards. If a pollutant concentration in an area is lower than the standard, the area is classified as being in "attainment." If the pollutant exceeds the standard, the area is in marginal, moderate, serious, severe, or extreme "nonattainment," depending on the magnitude of the air quality standard exceedance. If there are not enough data available to determine whether the standard is exceeded in an area, the area is designated "unclassified."

(a) South Coast Air Basin (SoCAB)

At the federal level, the SoCAB is designated as an extreme nonattainment area for ozone and a serious nonattainment area for PM_{10}. The area is also a federal-level nonattainment area for $PM_{2.5}$. The federal status of the Basin for CO was recently upgraded to a "serious maintenance area" from nonattainment, and the Basin is in attainment for NO_2 and SO_2.

At the state level, the SoCAB is also designated as an extreme nonattainment area for ozone and a nonattainment area for $PM_{2.5}$ and PM_{10}. It is in attainment for the state CO standard, and it is in attainment for both state ambient air quality standards for SO_2, and NO_2, a subcategory of NO_X.

(b) Existing Pollutant Levels at Nearby Monitoring Stations

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 (SRAs) in which 32 monitoring stations operate. The City of Pasadena is located within is SRA 8, the West San Gabriel Valley Monitoring Area. The monitoring station for this area is the Pasadena Monitoring Station, which is located at 752 South Wilson Ave, approximately 1.4 miles northeast of the project site. Criteria pollutants, including CO, NO_2, O_3, $PM_{2.5}$ and sulfate (SO_4), are

monitored at the Pasadena station. The nearest most representative monitoring area for PM_{10} is the East San Gabriel Valley Monitoring Station. This station is located at 803 North Loren Ave., Azusa, approximately 13 miles east of the project site. The nearest, most representative monitoring area for SO_2 and lead is the Central L.A. Monitoring Area, specifically the Los Angeles, North Main Street Monitoring Station, which is located at 1630 North Main Street, Los Angeles, approximately 6 miles southwest of the project site. The most recent data available from these monitoring stations encompassed the years 2006 to 2010. The data, shown in **Table 4.B-3**, *Pollutant Standards and Ambient Air Quality Data - Representative Monitoring Stations*, shows the following pollutant trends:

Ozone - The maximum 1-hour O_3 concentration recorded during the 2006 to 2010 period was 0.176 parts per million (ppm), recorded in 2009. During this period, the California standard was exceeded between 1 and 25 times annually and the National standard was exceeded between 0 and 5 times annually, with no exceedances in 2008 and 2010. The maximum 8-hour O_3 concentration was 0.117 ppm recorded in 2006. The National standard was exceeded between 3 and 16 times annually and the California standard was exceeded between 6 and 26 times annually.

Particulate Matter (PM_{10}) - The highest recorded 24-hour PM_{10} concentration recorded was 109 μg/m^3 in 2007. During the period 2006 to 2010, the CAAQS for 24-hour PM_{10} was exceeded between 9 and 27 percent of the time; the NAAQS was not violated. The maximum annual arithmetic mean recorded was 40.0 μg/m^3 in 2007.

Fine Particulates ($PM_{2.5}$) - The maximum 24-hour $PM_{2.5}$ concentration recorded was 68.9 μg/m^3 in 2007. The 24-hour NAAQS was exceeded between 0 and 2.8 percent annually from 2006 to 2010. The highest annual arithmetic mean of 14.3 was recorded in 2007.

Carbon Monoxide - The highest 1-hour CO concentration recorded was 4 ppm, recorded in 2006 and 2009. The maximum 8-hour CO concentration recorded was 2.8 ppm recorded in 2006. 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 0.12 ppm in 2006. The highest recorded NO_2 annual arithmetic mean was 0.0246 ppm recorded in 2007. As shown the standards were not exceeded during the five-year period.

Sulfur Dioxide – The highest 1-hour concentration of SO_2 was 0.03 ppm in 2006. The maximum 24-hour concentration was 0.006 ppm, recorded in 2006. As shown the standards were not exceeded during the five-year period.

Lead – The highest maximum 30 day average for Pb was 0.04 μg/m^3 in 2007. The maximum calendar quarter was 0.03 μg/m^3 also in 2007. The Basin is currently in compliance with California and National standards for lead and monitoring is only conducted periodically since the primary sources of atmospheric lead, leaded gasoline and lead-based paint, are no longer available in the Basin.

Sulfate – The highest maximum 24 hour concentration of sulfate recorded was 28.7 μg/m^3 in 2006. The 24-hour CAAQS was exceeded once in 2006 by 1.7 percent.

Table 4.B-3

Pollutant Standards and Ambient Air Quality Data
Representative Monitoring Stations [a]

Pollutant/Standard	2006	2007	2008	2009	2010
Ozone					
O_3 (1-hour)					
Maximum Concentration (ppm)	0.150	0.149	0.122	0.176	0.101
Days > CAAQS (0.09 ppm)	25	13	16	12	1
Days > NAAQS (0.12 ppm)	5	3	0	3	0
Ozone (8-hour)					
Maximum Concentration (ppm)	0.117	0.100	0.100	0.114	0.081
4th High 8-hour Concentration (ppm)	0.095	0.089	0.091	0.095	0.075
Days > CAAQS (0.07 ppm)	24	21	26	19	6
Days > NAAQS (0.075 ppm) [b]	7	11	16	12	3
Particulate Matter 10					
PM_{10} (24-hour)					
Maximum Concentration ($\mu g/m^3$)	81	109	98	74	70
Days > CAAQS (50 $\mu g/m^3$) [c]	7(12.1%)	11(20%)	13(27%)	7(13.5%)	5(9.1%)
Days > NAAQS (150 $\mu g/m^3$) [c]	0	0	0	0	0
PM_{10} (Annual Average)					
Annual Arithmetic Mean, CAAQS (20 $\mu g/m^3$)	31.9	40.0	35.3	32.0	29.8
Particulate Matter 2.5					
$PM_{2.5}$ (24-hour)					
Maximum Concentration ($\mu g/m^3$)	45.9	68.9	66.0	52.0	35.2
Days > NAAQS (35 $\mu g/m^3$) [d]	1(0.9%)	3(2.8%)	2(1.7%)	3(2.8%)	0
$PM_{2.5}$ (Annual Average)					
Annual Arithmetic Mean [e]	13.4	14.3	12.9	12.3	10.2
Carbon Monoxide					
CO (1-hour)					
Maximum Concentration (ppm)	4	3	3	4	3
Days > CAAQS (20 ppm)	--	--	--	--	--
Days > NAAQS (35 ppm)	--	--	--	--	--
CO (8-hour)					
Maximum Concentration (ppm)	2.8	2.3	2.1	2.1	2.0
Days > CAAQS (9 ppm)	--	--	--	--	--
Days > NAAQS (9 ppm)	--	--	--	--	--
Nitrogen Dioxide					
NO_2 (1-hour)					
Maximum Concentration (ppm)	0.12	0.09	0.11	0.08	0.07
Days > CAAQS (0.18 ppm)	--	--	--	--	--
NO_2 (Annual Average—NAAQS)					
Annual Arithmetic Mean	0.0245	0.0246	0.0235	0.0221	0.0196
Days > CAAQS (0.03 ppm)	--	--	--	--	--
Days > NAAQS (0.053 ppm)	--	--	--	--	--

Table 4.B-3 (Continued)

Pollutant Standards and Ambient Air Quality Data
Representative Monitoring Stations [a]

Pollutant/Standard	2006	2007	2008	2009	2010
Sulfur Dioxide					
SO_2 (1-hour)					
Maximum Concentration (ppm)	0.03	0.01	0.01	0.01	0.01
Days > CAAQS (0.25 ppm)	--	--	--	--	--
SO_2 (24-hour)					
Maximum Concentration (ppm)	0.006	0.003	0.002	0.002	0.002
Days > CAAQS (0.04 ppm)	--	--	--	--	--
Days > NAAQS (0.14 ppm)	--	--	--	--	--
SO_2 (Annual Average)					
Annual Arithmetic Mean	0.0019	0.0299	0.0003	--	--
Days > CAAQS (0.030 ppm)	--	--	--	--	--
Lead					
Maximum 30-day average ($\mu g/m^3$)	0.02	0.04	0.02	0.02	0.02
Days > NAAQS (1.5 μg/m3)	--	--	--	--	--
Maximum calendar quarter ($\mu g/m^3$)	0.01	0.03	0.02	0.01	0.01
Days > CAAQS (1.5 $\mu g/m^3$)	--	--	--	--	--
Sulfate					
Maximum 24-hour Concentration ($\mu g/m^3$)	28.7	22.4	14.1	8.8	7.7
Days > CAAQS (25 $\mu g/m^3$)	1(1.7%)	0	0	0	0

ppm *= parts per million;* ***μg/m³*** *= micrograms per cubic meter;* ***--*** *= not applicable;* ***--*** *= Data not available*

+*= The following PM10 data samples were excluded from compliance consideration in accordance with the USEPA Exceptional Event Regulation.*

[a] *Data presented for O_3, CO, NO_2, $PM_{2.5}$ and sulfate is from the West San Gabriel Valley (SRA-8) Monitoring Station. Data for PM_{10} is from the East San Gabriel Valley 1 (SRA-9) Monitoring Station. Data for SO_2 and lead is from the Central L.A. (SRA-1) Monitoring Station.*

[b] *In May 2008, the federal 8-hour ozone standard was changed from 0.08 ppm to 0.075 ppm. The data representing days above the standard applies to the old standard.*

[c] *Measurements were collected every six days. Measured days count the days that a measurement was greater than the level of the standard. Data is recorded as number (percentage) of samples exceeding the standard.*

[d] *In September 2006, the 24-hr $PM_{2.5}$ standard was changed from 65 $\mu g/m^3$ to 35 $\mu g/m^3$. The data representing days above standard applies to the old standard for 2003, 2004, and 2005.*

[e] *Federal $PM_{2.5}$ standard is annual average (AAM)> 15 $\mu g/m^3$; and state standard is monthly average >12 $\mu g/m^3$.*

Source: South Coast Air Quality Management District, California Air Resources Board, Ambient Monitoring Data 2006-2010.

(2) Existing Health Risk in the Surrounding Area

According to the SCAQMD's MATES-III study, the cancer risk in the project vicinity is 833 in one million, which is substantially lower than the average cancer risk in the Basin of 1,400 per million.[9] The cancer risk in the project vicinity is largely due to diesel particulates generated by motor vehicle sources.

[9] *SCAQMD, MATES III – Model Estimated Carcinogenic Risk. See http://www3.aqmd.gov/webappl/matesiii/ (accessed August 2012).*

c. Air Pollutants and Health Effects

(1) Air Pollutants

Air pollutant emissions within the air basin are generated from stationary, mobile, and natural sources. Stationary sources can be divided into two major subcategories: point and area sources. Point sources occur at an identified location and are usually associated with manufacturing and industry. Examples are boilers or combustion equipment that produce electricity or generate heat. Area sources are widely distributed and produce many small emissions. Examples of area sources include residential and commercial water heaters, painting operations, portable generators, lawn mowers, agricultural fields, landfills, and consumer products such as barbeque lighter fluid and hair spray. Construction activities that create fugitive dust such as excavation and grading also contribute to area source emissions. Mobile sources refer to emissions from on- and off-road motor vehicles, including tailpipe and evaporative emissions. On-road sources may be legally operated on roadways and highways. Off-road sources include aircraft, trains, and construction equipment. Mobile sources account for the majority of the air pollutant emissions within the air basin. Air pollutants can also be generated by the natural environment such as when fine dust particles are pulled off the ground surface and suspended in the air during high winds.

To protect the public health and welfare, the federal and state governments have identified five criteria air pollutants, a host of air toxics, and have established ambient air quality standards through the Federal Clean Air Act and the California Clean Air Act. The air pollutants for which federal and state standards have been promulgated and which are most relevant to air quality planning and regulation in the air basins include ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), suspended particulate matter (PM), sulfur dioxide (SO_2), and lead (Pb).

Air pollutants are typically classified as primary or secondary pollutants. Carbon monoxide, nitrogen dioxide, particulate matter, sulfur dioxide, and lead are considered primary pollutants because they are emitted directly into the atmosphere. Ozone is considered a secondary pollutant because it is formed through a photochemical reaction in the atmosphere with volatile organic compounds (VOCs) and nitrogen oxides (NO_X) which in the presence of sunlight produces O_3.

Carbon Monoxide (CO): a colorless, odorless gas produced by the incomplete combustion of fuels. CO concentrations tend to be the highest during the winter morning, with little to no wind, when surface-based inversions trap the pollutant at ground levels. Because CO is emitted directly from internal combustion engines, and motor vehicles operating at slow speeds are the primary source of CO in the Basin, the highest ambient CO concentrations are generally found near congested transportation corridors and intersections.

Nitrogen Dioxide (NO_2): is a reddish-brown gas with a pungent and irritating odor. It transforms in the air to form gaseous nitric acid and toxic organic nitrates. NO_2 also plays a major role in atmospheric reactions that produce ground-level ozone, a major component of smog. It is also a precursor to nitrates, which contribute to increased respirable particle levels in the atmosphere.

Respirable Particulate Matter (PM_{10}) and Fine Particulate Matter ($PM_{2.5}$): extremely small, suspended particles or droplets 10 microns and 2.5 microns or smaller in diameter. Some sources of particulate matter, like pollen and windstorms, are naturally occurring. However, in populated areas, most particulate matter is

caused by road dust, diesel soot, combustion products, abrasion of tires and brakes, and construction activities.

Sulfur dioxide (SO_2): a colorless, extremely irritating gas or liquid. It enters the atmosphere as a pollutant mainly as a result of burning high sulfur-content fuel oils and coal, and from chemical processes occurring at chemical plants and refineries. Although sulfur dioxide concentrations have been reduced to levels well below state and national standards, further reductions are desirable because SO_2 is a precursor to sulfates which can also affect human health. Sulfur Dioxide converts rapidly to sulfates within California due to regional meteorological features. Sulfates are a particulate formed through the photochemical oxidation of SO_2.

Lead (Pb): occurs in the atmosphere as particulate matter. The combustion of leaded gasoline is the primary source of airborne lead in the Basins. The use of leaded gasoline is no longer permitted for on-road motor vehicles; therefore, most lead combustion emissions are currently associated with off-road vehicles such as racecars and some jet fuels. Other sources of lead occur in the manufacturing and recycling of batteries, paint, ink, ceramics, ammunition, and secondary lead smelters.

Ozone (O_3): a gas that is formed when VOCs, which can also be referred to as reactive organic gases (ROG), and NO_X, both byproducts of internal combustion engine exhaust, undergo slow photochemical reactions in the presence of sunlight. Meteorological conditions that are needed to produce high concentrations of ozone are direct sunshine, early morning stagnation in source areas, high ground surface temperatures, strong and low morning inversions, greatly restricted vertical mixing during the day, and daytime subsidence that strengthens the inversion layer. Ozone concentrations are generally highest during the summer months when direct sunlight, light wind, and warm temperature conditions are favorable.

Toxic Air Contaminants (TACs): TACs are a diverse group of air pollutants that can affect human health, but have not had ambient air quality standards established for them. This is not because they are fundamentally different from the pollutants discussed above, but because their effects tend to be local rather than regional. The California Air Resources Board (CARB) has designated nearly 200 compounds as TACs. The Unites States Environmental Protection Agency (USEPA) has assessed this expansive list of toxics and identified 21 TACs as Mobile Source Air Toxics (MSATs). MSATs are compounds emitted from highway vehicles and nonroad equipment, through fuel evaporation and combustion, engine wear, or impurities in oil and gas. USEPA also extracted a subset of these 21 MSAT compounds that it now labels as the six priority MSATs: benzene, formaldehyde, acetaldehyde, diesel particulate matter/diesel exhaust organic gases, acrolein, and 1,3-butadiene. Additionally, CARB has implemented control measures for a number of compounds that pose high risks and show potential for effective control. The majority of the estimated health risks from TACs can be attributed to a relatively few compounds, the most important being particulate matter from diesel-fueled engines.

(2) Health Effects of Air Pollutants

Carbon Monoxide: Individuals with a deficient blood supply to the heart are the most susceptible to the adverse effects of CO exposure. The effects observed include earlier onset of chest pain with exercise, and electrocardiograph changes indicative of worsening oxygen supply to the heart. Inhaled CO has no direct toxic effect on the lungs, but exerts its effect on tissues by interfering with oxygen transport and competing with oxygen to combine with hemoglobin present in the blood to form carboxyhemoglobin (COHb). Hence,

conditions with an increased demand for oxygen supply can be adversely affected by exposure to CO. Individuals most at risk include fetuses, patients with diseases involving heart and blood vessels, and patients with chronic hypoxemia (oxygen deficiency) as seen at high altitudes. Reduction in birth weight and impaired neurobehavioral development have been observed in animals chronically exposed to CO, resulting in COHb levels similar to those observed in smokers. Recent studies have found increased risks for adverse birth outcomes with exposure to elevated CO levels; these include pre-term births and heart abnormalities.

Nitrogen Dioxide: Population-based studies suggest that an increase in acute respiratory illness, including infections and respiratory symptoms in children (not infants), is associated with long-term exposure to NO_2 at levels found in homes with gas stoves, which are higher than ambient levels found in Southern California. Increase in resistance to air flow and airway contraction is observed after short-term exposure to NO_2 in healthy subjects. Larger decreases in lung functions are observed in individuals with asthma or chronic obstructive pulmonary disease (e.g., chronic bronchitis, emphysema) than in healthy individuals, indicating a greater susceptibility of these sub-groups. In animals, exposure to levels of NO_2 considerably higher than ambient concentrations results in increased susceptibility to infections, possibly due to the observed changes in cells involved in maintaining immune functions. The severity of lung tissue damage associated with high levels of ozone exposure increases when animals are exposed to a combination of ozone and NO_2.

Particulate Matter: A consistent correlation between elevated ambient fine particulate matter (PM_{10} and $PM_{2.5}$) levels and an increase in mortality rates, respiratory infections, number and severity of asthma attacks and the number of hospital admissions has been observed in different parts of the United States and various areas around the world. In recent years, some studies have reported an association between long-term exposure to air pollution dominated by fine particles and increased mortality, reduction in life span, and an increased mortality from lung cancer. Daily fluctuations in $PM_{2.5}$ concentration levels have also been related to hospital admissions for acute respiratory conditions in children, to school and kindergarten absences, to a decrease in respiratory lung volumes in normal children, and to increased medication use in children and adults with asthma. Recent studies show lung function growth in children is reduced with long-term exposure to particulate matter. The elderly, people with pre-existing respiratory or cardiovascular disease, and children appear to be more susceptible to the effects of high levels of PM_{10} and $PM_{2.5}$.

Sulfur Dioxide: A few minutes of exposure to low levels of SO_2 can result in airway constriction in some asthmatics, all of whom are sensitive to its effects. In asthmatics, increase in resistance to air flow, as well as reduction in breathing capacity leading to severe breathing difficulties, are observed after acute exposure to SO_2. In contrast, healthy individuals do not exhibit similar acute responses even after exposure to higher concentrations of SO_2. Animal studies suggest that despite SO_2 being a respiratory irritant, it does not cause substantial lung injury at ambient concentrations. However, very high levels of exposure can cause lung edema (fluid accumulation), lung tissue damage, and sloughing off of cells lining the respiratory tract. Some population-based studies indicate that the mortality and morbidity effects associated with fine particles show a similar association with ambient SO_2 levels. In these studies, efforts to separate the effects of SO_2 from those of fine particles have not been successful. It is not clear whether the two pollutants act synergistically or one pollutant alone is the predominant factor. The effects of sulfate exposure at levels above the standard include the aggravation of asthmatic symptoms, an increased risk of cardio-pulmonary disease, and a decrease in respiratory function.

Lead: Fetuses, infants, and children are more sensitive than others to the adverse effects of exposure to Pb. Exposure to low levels of Pb can adversely affect the development and function of the central nervous

system, leading to learning disorders, distractibility, inability to follow simple commands, and lower intelligence quotient. In adults, increased Pb levels are associated with increased blood pressure. Pb poisoning can cause anemia, lethargy, seizures, and death, although it appears that there are no direct effects of Pb on the respiratory system. Pb can be stored in the bone from early age environmental exposure, and elevated blood Pb levels can occur due to breakdown of bone tissue during pregnancy, hyperthyroidism (increased secretion of hormones from the thyroid gland) and osteoporosis (breakdown of bony tissue). Fetuses and breast-fed babies can be exposed to higher levels of Pb because of previous environmental Pb exposure of their mothers.

Ozone: Individuals exercising outdoors, children, and people with preexisting lung disease, such as asthma and chronic pulmonary lung disease, are considered to be most susceptible to ozone effects. Short-term exposure (lasting for a few hours) to ozone at levels typically observed in Southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes. Elevated ozone levels are associated with increased school absences. In recent years, a correlation between elevated ambient ozone levels and increases in daily hospital admission rates, as well as mortality, has also been reported. An increased risk for asthma has been found in children who participate in multiple sports and live in high ozone communities. Ozone exposure under exercising conditions is known to increase the severity of the responses described above. Animal studies suggest that exposure to a combination of pollutants that includes ozone may be more toxic than exposure to ozone alone. Although lung volume and resistance changes observed after a single exposure diminish with repeated exposures, biochemical and cellular changes appear to persist, which can lead to subsequent lung structural changes.

Reactive Organic Gases: Reactive organic gases are carbon-containing compounds that typically evaporate into the air where they can react with other chemicals. VOCs contribute to the formation of smog, and in some cases may themselves be toxic. Because of the number of compounds that are included in the term VOC, the health effects of the individual gases are not discussed in this document. VOCs often have an odor and some examples including chemicals in gasoline, alcohol and the solvents used in paints.

Odors: The science of odor as a health concern is still new. Merely identifying the hundreds of VOCs that cause offensive odors poses a big challenge. Odors can potentially affect human health in several ways. First, odorant compounds can irritate the eye, nose, and throat, which can reduce respiratory volume. Second, the VOCs that cause odors can stimulate sensory nerves to cause neurochemical changes that might influence health, for instance, by compromising the immune system. Finally, unpleasant odors can trigger memories or attitudes linked to unpleasant odors, causing cognitive and emotional effects such as stress.

2. ENVIRONMENTAL IMPACTS

a. Thresholds of Significance

The City of Pasadena has not adopted its own thresholds for the evaluation of impacts on air quality. Based on the Initial Study Environmental Checklist form contained in Appendix G of the State *CEQA Guidelines*, the project would have a significant impact if it would:

AQ-1 Conflict with or obstruct implementation of the applicable air quality plan;

AQ-2 *Violate any air quality standard or contribute substantially to an existing or projected air quality violation;*

AQ-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);*

AQ-4 *Expose sensitive receptors to substantial pollutant concentrations; or*

AQ-5 *Create objectionable odors affecting a substantial number of people.*

The State *CEQA Guidelines* (Section 15064.7) provide that, when available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make determinations of significance. The potential air quality impacts of the implementing project s are, therefore, evaluated according to thresholds developed by the SCAQMD in the *CEQA Air Quality Handbook*, *Air Quality Analysis Guidance Handbook*, and subsequent guidance, discussed below. These thresholds generally incorporate the checklist questions contained in Appendix G of the State *CEQA Guidelines*.

(1) AQMP Consistency

The SCAQMD is required, pursuant to the CAA to reduce emissions of criteria pollutants for which the SoCAB is in non-attainment of Federal standards. The implementing projects would be subject to the SCAQMD's 2007 AQMP.[10] The 2012 AQMP is currently being developed through a multi-agency effort by the SCAQMD, CARB, SCAG, and USEPA and will incorporate the most up-to-date scientific information and planning assumptions. The AQMP contains a comprehensive list of pollution control strategies directed at reducing emissions and achieving ambient air quality standards. These strategies are developed, in part, based on regional population, housing, and employment project ions prepared by SCAG.

SCAG is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino and Imperial Counties and serves as a forum for regional issues relating to transportation, the economy, community development and the environment. SCAG serves as the federally designated metropolitan planning organization (MPO) for the southern California region. With regard to air quality planning, SCAG has prepared the RCPG, which includes Growth Management and Regional Mobility chapters that form the basis for the land use and transportation control portions of the AQMP, and are utilized in the preparation of air quality forecasts and consistency analysis included in the AQMP. Both the RCPG and AQMP strategy incorporate project ions from local planning documents.

A project is consistent with the AQMP if it is consistent with the applicable rules and regulations and the population, housing and employment assumptions which were used in the development of the AQMP. The 2007 AQMP, the most recent AQMP adopted by the SCAQMD, incorporates SCAG's Regional Transportation Plan (RTP) socioeconomic forecast projections of regional population and employment growth.

[10] *SCAQMD, Clean Air Plans. See http://www.aqmd.gov/aqmp/index.html (accessed August 2012).*

(2) Air Quality Standards

The City of Pasadena has not adopted specific significance thresholds for air quality impacts. However, because of the SCAQMD's regulatory role in the Basin, the significance thresholds and analysis methodologies in the SCAQMD *CEQA Air Quality Handbook* guidance document will be used in evaluating project impacts. The SCAQMD has established mass emission thresholds below which it is unlikely that an individual project's incremental increase in emissions could cause or contribute substantially to an exceedance of applicable ambient air quality standards. Based on these criteria, the proposed project would result in a potentially significant impact if any of the following would occur:

(a) Construction Thresholds

A potentially significant impact may occur if regional emissions during construction from both direct and indirect sources would exceed any of the following SCAQMD mass emission threshold levels listed below. If so, air quality dispersion modeling may be used determine if the emissions would cause an exceedance of applicable air quality standards.[11]

- 550 pounds per day CO
- 75 pounds per day of VOC
- 100 pounds per day of NO_X
- 150 pounds per day of SO_X
- 150 pounds per day of PM_{10}
- 55 pounds per day of $PM_{2.5}$

Exceedance of SCAQMD mass emission thresholds does not explicitly mean an exceedance of applicable air quality standards is expected. Refined air quality dispersion modeling should be performed to predict impacts to ground level ambient pollutant levels.

(b) Operation Thresholds

A potentially significant impact may occur if regional emissions during operations from both direct and indirect sources would exceed any of the following SCAQMD mass emission threshold levels listed below. If so, air quality dispersion modeling may be used determine if the emissions would cause an exceedance of applicable air quality standards:[12]

- 550 pounds per day of CO
- 55 pounds per day of VOC

[11] *SCAQMD, CEQA Air Quality Handbook, Chapter 6 (Determining the Air Quality Significance of a Project), 1993; and Air Quality Analysis Guidance Handbook. See http://www.aqmd.gov/ceqa/hdbk.html (accessed August 2012).*

[12] *SCAQMD, CEQA Air Quality Handbook, Chapter 6 (Determining the Air Quality Significance of a Project), 1993; and Air Quality Analysis Guidance Handbook. See http://www.aqmd.gov/ceqa/hdbk.html (accessed August 2012).*

- 55 pounds per day of NO_X
- 150 pounds per day of SO_X
- 150 pounds per day of PM_{10}
- 55 pounds per day of $PM_{2.5}$

Exceedance of SCAQMD mass emission thresholds does not explicitly mean an exceedance of applicable air quality standards is expected. Refined air quality dispersion modeling should be performed to predict impacts to ground level ambient pollutant levels.

(c) Localized Significance Thresholds

Localized Significance Thresholds (LSTs) were developed in response to the SCAQMD Governing Board's Environmental Justice Enhancement Initiative (I-4). The LST methodology was provisionally adopted by the SCAQMD Governing Board in October 2003 and formally approved by SCAQMD's Mobile Source Committee in February 2005. 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 and distance to the nearest sensitive receptor.

LSTs, which are voluntary, only apply to CO, NO_2, PM_{10}, and $PM_{2.5}$ emissions during construction and operation at the discretion of the lead agency. Screening-level analysis of LSTs is only recommended for construction activities at project sites that are 5 acres or less. The SCAQMD recommends that operational activities and construction for any project over 5 acres should perform air quality dispersion modeling to assess impacts to nearby sensitive receptors. Dispersion modeling would be required for CO_2, NO_X, PM_{10}, and $PM_{2.5}$ emissions during construction and for operational activities. NO_X to NO_2 conversion would be accounted for during the modeling to determine the maximum NO_2 concentrations at the nearest sensitive receptors.

The SCAQMD has developed methodology to assess the potential for localized emissions to cause an exceedance of applicable ambient air quality standards. Impacts would be considered significant if the following would occur:

- Maximum daily localized emissions are greater than the LST, resulting in predicted ambient concentrations in the vicinity of the project site greater than the most stringent ambient air quality standards for CO and NO_2.[13]
- Maximum localized PM_{10} or $PM_{2.5}$ emissions during construction are greater than the applicable LSTs, resulting in predicted ambient concentrations in the vicinity of the site to exceed 50 $\mu g/m^3$ over five hours (SCAQMD Rule 403 control requirement).

[13] *SCAQMD, Final Localized Significance Threshold Methodology, July 2003, Revised July 2008. See http://www.aqmd.gov/ceqa/handbook/LST/LST.html (accessed August 2012).*

Based on criteria set forth in the SCAQMD CEQA Air Quality Handbook, the proposed project would have a significant impact with regard to operational emissions if any of the following would occur:

- Traffic generated by the implementing project s causes an exceedance of the California 1-hour or 8-hour CO standards of 20 or 9.0 ppm, respectively, at an intersection or roadway within one-quarter mile of a sensitive receptor.
- The project would not be compatible with City of Pasadena, SCAQMD and SCAG air quality policies.

(3) Non-Attainment Pollutants

The SoCAB fails to meet national and state standards for O_3 (for both the 1-hour and 8-hour standard), PM_{10} (24-hour and annual) and $PM_{2.5}$, and therefore is considered a federal and state "non-attainment" area for these pollutants. A significant impact may occur if a project would add a cumulatively considerable contribution of a federal or state non-attainment pollutant.

(4) Toxic Air Contaminants

Additionally, the SCAQMD *CEQA Air Quality Handbook* states that the determination of the significance of TACs shall be made on a case-by-case basis, considering the following factors:

- The regulatory framework for the toxic material(s) and process(es) involved;
- The proximity of the TACs to sensitive receptors;
- The quantity, volume and toxicity of the contaminants expected to be emitted;
- The likelihood and potential level of exposure; and
- The degree to which the design of the proposed project will reduce the risk of exposure.

Based on these guidelines, the proposed project would have a significant impact from TACs, if:

- On-site stationary sources emit carcinogenic air contaminants or TACs that individually or cumulatively exceed the maximum individual cancer risk of ten in one million or an acute or chronic hazard index of 1.0.[14]
- Hazardous materials associated with on-site stationary sources result in an accidental release of air toxic emissions or acutely hazardous materials posing a threat to public health and safety.

In addition, the CARB has published a draft version of the *Air Quality and Land Use Handbook* on February 17, 2005, to serve as a general guide for considering impacts to sensitive receptors from facilities that emit TAC emissions. The recommendations provided therein are voluntary and do not constitute a requirement or mandate for either land use agencies or local air districts. The goal of the guidance document is to protect sensitive receptors, such as children, the elderly, acutely ill, and chronically ill persons, from exposure to TAC emissions. Some examples of CARB's siting recommendations include the following: (1) avoid siting sensitive receptors within 500 feet of a freeway, urban road with 100,000 vehicles per day, or rural roads with 50,000 vehicles per day; (2) avoid siting sensitive receptors within 1,000 feet of a distribution center

[14] *SCAQMD, Risk Assessment Procedures for Rules 1401 and 212, July 2005.*

(that accommodates more than 100 trucks per day, more than 40 trucks with operating transport refrigeration units per day, or where transport refrigeration unit operations exceed 300 hours per week); and (3) avoid siting sensitive receptors within 300 feet of any dry cleaning operation using perchloroethylene, and for operations with two or more machines provide 500 feet. Since the project introduces potentially sensitive populations to the area, these guidelines will be used in addition the SCAQMD criteria listed above.

(5) Odors

The SCAQMD *CEQA Air Quality Handbook* contains secondary thresholds consistent with the Appendix G *CEQA Guidelines* regarding odors. More specifically, the project would have a significant impact if it has the potential to create, or be subjected to, an objectionable odor that could impact sensitive receptors.

b. Methodology

Separate emissions and modeling analyses were performed for the project construction, commissioning and operational emissions because these activities will occur at and for different time periods and durations.

(1) Construction

Construction of the proposed project has the potential to create air quality impacts through the use of heavy-duty construction equipment and through vehicle trips generated from construction workers traveling to and from the project site. In addition, fugitive dust emissions would result from grading and construction activities. As mentioned above, there are four components to the construction of the proposed project: soil remediation on the Unit GT-5 site; demolition of existing structures on the Unit GT-5 site; construction of Unit GT-5; and seismic improvements to, and construction of the administrative/control room within, the Glenarm Building. It is anticipated that construction of the proposed project would consist of two simultaneous phases and take up to 23 months each following project approval. Each construction phase would include approximately two weeks of soil removal, five months of demolition and asbestos abatement, approximately 16 months of grading, excavation, and construction of the power generation unit and auxiliary facilities, and approximately seven months of demolition and construction of the administrative/control room. Project construction would result in approximately 13,000 cubic yards of cut soil that would be temporarily stockpiled on the project site. Of this volume, approximately 11,700 cubic yards would be reused on-site and approximately 1,300 cubic yards would require export to an off-site location. In addition, construction demolition would result in 1,500 cubic yards of debris that would require off-site disposal. Settlement during re-compaction and volume created during removal of existing below ground features will likely require the import of 5,200 yards of suitable fill material.

Construction is anticipated to commence as early as the fall of 2013 with completion by the spring of 2015. Construction activities would be the same for Unit GT-5, whether the GE LM 6000 turbine or the Rolls-Royce Trent 60 turbine is chosen.

Mass daily emissions during construction were compiled using CalEEMod, for each of the four scenarios listed above, which is an emissions estimation/evaluation model developed by the CARB that is based, in part, on SCAQMD guidelines and methodologies. The CalEEMod model separates the construction process into three phases. The first phase is building demolition with possible emissions resulting from demolition dust, debris haul truck trips, equipment exhaust, and worker commute exhaust. The second phase of

construction is site grading with potential emissions resulting from fugitive dust, soil haul truck trips, equipment exhaust, and worker commute exhaust. The third phase is subdivided into building equipment, architectural coating, asphalt, and worker commute. Emissions from the third phase of construction include equipment exhaust from building construction and asphalt paving, VOC emissions from architectural coating and asphalt paving, and worker commute exhaust. A complete listing of the construction equipment by phase and construction phase duration assumptions used in this analysis is included within the CalEEMod printout sheets that are provided in **Appendix B** of this Draft EIR.

Mobile source emissions, primarily NO_X and PM, would result from the use of construction equipment such as bulldozers, wheeled loaders, and cranes. During the finishing phase, the application of architectural coatings (i.e., paints) and other building materials would release reactive organic compounds. Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation and, for dust, the prevailing weather conditions. The assessment of construction air quality impacts considers each of these potential sources. The equipment mix and construction duration for each stage is detailed in **Appendix B** of this Draft EIR.

The amount of construction equipment used and the duration of construction activity could have a substantial effect upon the amount of construction emissions, concentrations and the resulting impacts occurring at any one time. As such, the emission forecasts provided reflect a specific set of conservative assumptions based on the expected construction scenario wherein a relatively large amount of construction is occurring in a relatively intensive manner.

In addition to the typical construction activities associated with the construction of Unit GT-5, combustion turbines typically require a commissioning stage for testing and certification of the combined-cycle power generation unit. According to the schedule provided by PWP's Owner's Engineer, Unit GT-5 (GE LM 6000 or Rolls-Royce Trent 60) will be commissioned in a total of 12 phases (days) lasting 204 hours. Commissioning activities involves all of the steps from the first fire of the combustion turbine through reliability testing. During initial commissioning, tests will be performed on the combustion turbine to verify its performance and make any needed adjustments. Following commissioning, the GT-5 unit will be ready for normal operation. Commissioning emissions are being considered under construction because the GT-5 unit will have to be certified before operation can commence. It is important to note that commissioning emissions are short-term, one-time, emissions that occur within a short time frame.

The localized effects from the on-site portion of daily construction emissions were evaluated at sensitive receptor locations potentially impacted by the project through project-specific modeling. LSTs are only applicable to the following pollutants: NO_X, CO, PM_{10}, and $PM_{2.5}$. LSTs represent the maximum emissions from a project that would not 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 SRA and distance to the nearest sensitive receptor. For PM_{10} and $PM_{2.5}$, LSTs were derived based on requirements in SCAQMD Rule 403, Fugitive Dust. 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. For construction emissions, the LST lookup tables were utilized. If the project exceeds an applicable LST when the mass rate look-up tables are used as a screening analysis, then project specific air quality modeling model may be performed. The SCAQMD recommends that the USEPA AERMOD model be used for the project specific analysis.

Dispersion modeling was performed using the USEPA AERMOD model with meteorological data obtained from the SCAQMD West San Gabriel Valley monitoring station for commissioning emissions. Receptors were placed at sensitive receptors including residential and school uses with a 25-meter grid spacing. The ozone limiting method (OLM) was also enabled to properly calculate NO_2 conversion from NO_X emissions.

(2) Operations

(a) Mass Emissions

Operation of the new combustion turbine GT-5 (GE LM 6000 or Rolls-Royce Trent 60) can commence once the commissioning process discussed above is complete. The GT-5 turbine would result in the emissions of criteria air pollutants, and TACs. The operation of the wet cooling tower will also result in the emission of particulate matter and TACs. Criteria pollutant emissions from the combustion turbine are affected by several factors; most important is the mode of operation and the ambient meteorological conditions. Three operational modes were analyzed as worst-case scenarios for project operations for each of the configurations being considered: (1) normal operation (17°F, 100 percent load, without chiller) and 5 starts and 5 shutdowns, (2) water injection and intercooler tuning with normal operation (17°F, 100 percent load, without chiller), and (3) ammonia injection grid tuning with normal operation (17°F, 100 percent load, without chiller). The SCAQMD conducts attainment planning and demonstrations based on the daily maximum emissions. Thus, the criteria air pollutant emissions inventory for the GT-5 turbine used to compare to the mass emissions CEQA thresholds presented above are based on the maximum daily emissions. Dispersion modeling performed in support of the SCAQMD permit application relied on PTE annual emissions for those criteria pollutants with annual ambient air quality standards.

As mentioned previously, two different configurations are being considered for Unit GT-5: GE LM 6000 and Rolls-Royce Trent 60. Details of operation for each configuration are identical and are provided below. Calculations of operational emissions used in the analyses from both configurations were from data provided by the project applicant via the manufacturers.

Startup/Shutdown: Startup will be completed in an estimated 120 minutes, while shutdown will be completed in an estimated 60 minutes.

Normal Operation: During normal operation, the combustion turbine will operate at various load conditions of 50 percent or higher.

Commissioning: The combustion turbine will be commissioned in a total of 204 hours in 12 phases, from the first fire of the combustion turbine through the completion of certification.

Water Injection and Intercooler Tuning: Water injection and intercooler tuning on the combustion turbine unit will be performed two times a year. Each tuning episode is expected to be completed in 12 hours.

Ammonia Injection Grid Tuning: Tuning of the ammonia injection grid will be performed once a year. Tuning operation is expected to be completed in 10 hours.

In addition to the GT-5 emissions, the CalEEMod software was used to compile the mass daily emissions estimates from mobile (vehicular traffic), stationary (natural gas usage), and area (landscape or maintenance equipment) sources that would occur during long-term project operations. In calculating mobile-source emissions, the CalEEMod default trip length assumptions were applied to the average daily trip estimates to arrive at vehicle miles traveled. Stationary-source and area source emissions were calculated using data provided by PWP's Owner's Engineer. All emissions calculation worksheets and air quality modeling output files are provided in **Appendix B** of this Draft EIR.

(b) Dispersion Modeling

To demonstrate that the incremental increase in emissions would not create a violation of applicable NAAQSs, dispersion modeling was performed using the USEPA AERMOD model with meteorological data obtained from the SCAQMD West San Gabriel Valley monitoring station. Cartesian grid receptor points were placed at sensitive receptor locations including residential and school uses with a 25-meter grid spacing. The ozone limiting method (OLM) was also enabled to properly calculate NO_2 conversion from NO_X emissions. The pollutant concentrations used to compare to the ambient air quality standards presented above in Table 4.B-1 are based on the maximum hourly, daily, and annual emissions, as appropriate. Maximum annual emissions assume operation of GT-5 up to its permitted limit of 8,760 hours per year (24 hours per day, 365 days per year).

(c) CO Hot Spots

Motor vehicles are another source of CO pollutants. Traffic-congested roadways and intersections have the potential to generate localized high levels of CO. Carbon monoxide is produced in greatest quantities from vehicle combustion and is usually concentrated at or near ground level because it does not readily disperse into the atmosphere. However, the proposed project would result in a minimal increase in vehicular traffic compared to current practices, so project motor vehicle emissions will not contribute significantly to CO emissions.

(3) Toxic Air Contaminants Impacts (Construction and Operation)

Although unlimited annual usage of B-3 would be allowed under the requested SCAQMD permit to operate, Unit B-3 currently operates approximately only 2,000 hours per year. Therefore, the incremental increase in TAC emissions with chronic health effects was calculated as the difference between the maximum annual Potential to Emit (PTE) being sought in the SCAQMD operating permit for GT-5, which was calculated based on 8,760 hours per year (24 hours per day, 365 days per year), and the actual annual emissions of B-3. TAC emissions were estimated using emission factors from Table 3.1-3 of USEPA AP-42 for all TACs except for formaldehyde, benzene, acrolein, and polycyclic aromatic hydrocarbons (PAHs). Formaldehyde, benzene, and acrolein emission factors are from Section 3.1 of the Background Document for AP-42. PHA emission factor (speciated TACs) were obtained from the CATEF (emission factors developed by California ARB) database for natural gas-fired combustion turbines with CO/SCR catalysts. Annual TAC emissions were conservatively based on 8,760 hours of normal operation.

TAC emissions during commissioning, for either turbine configuration, would only occur for a short time, resulting in short term impacts. In addition, the fuel usage during most of the commissioning scenario would be lower than during normal operation because most of the commissioning scenario would involve

operating Unit GT-5 at low loads. TAC emissions during startup/shutdown operations would also be lower than during normal operation because the fuel usage during the startup/shutdown operations is lower than during normal operation. Thus, toxic air contaminant emissions during commissioning, startup and shutdown operations are not presented.

The cooling tower for the GE LM 6000 would be a 2-cell unit with a total circulation rate of 14,260 gallons per minute (gpm) and will have six cycles of concentration. The cooling tower for the Rolls-Royce Trent 60 would be similar, but with a total circulation rate of 10,000 gpm. PWP is proposing to use potable water from the Southern California Metropolitan Water District's (MWD's) Weymouth Plant. TACs in the potable water include: arsenic, fluoride, manganese, chromium (as cr+6), tetrachloroethylene, and trichloroethylene (PWP, 2009). Hourly and annual emissions of TACs were calculated utilizing six cycles of concentration and the maximum TACs in the potable water. Emissions were provided by the project applicant.

Consistent with State and local requirements under CEQA, a Health Risk Analysis (HRA) was conducted to evaluate the carcinogenic risk to residents and workers resulting from exposure to localized sources of TACs during operation of the project. The California Office of Environmental Health Hazard Assessment (OEHHA) has established risk factors for TACs based on a 70-year continuous exposure and provides methodologies to account for lesser exposure durations, such as workers (46-year, 8 hours/day). Nonetheless, cancer risk from inhalation of exhaust (e.g., DPM) from operation of this project was calculated using the USEPA recommended AERMOD dispersion model. Output from the dispersion analysis was used to estimate the TAC concentrations. The cancer risk estimate was then calculated based on those estimated DPM concentrations using the risk methodology promulgated by the OEHHA and SCAQMD.

The HRA provides cancer and non-cancer risk analyses for resident and worker receptors. As discussed previously, the nearest sensitive receptors to the project site are: single family residences approximately 210 feet (64 meters) to the west across Fair Oaks Avenue, multi-family residential approximately 425 feet (130 meters) to the south of the project site, and Blair High School approximately 645 feet (197 meters) to the east. Because the nearest potential sensitive receptors are residents located 64 meters from the project site and represent the worst-case potential exposure (70 year continuous), the HRA performed represents a worst-case scenario for all sensitive land uses in the vicinity. Therefore, the results of the HRA are that is also applicable to the student and school employee receptors at Blair High School, who are located further away and are potentially exposed to the project TAC emissions for shorter durations (180 and 240 days per year, respectively), than the resident receptors.

(4) Odor Impacts (Construction and Operation)

Potential odor impacts for a project where substantial emissions of odorous compounds are not expected (i.e. landfills, animal rendering facilities, etc.) are typically evaluated qualitatively, by conducting a screening-level analysis, If it is determined that a proposed project would introduce a new odor source, or modify an existing odor source, then downwind sensitive receptor locations are identified and site-specific dispersion modeling is conducted to determine project impacts.

c. Project Design Features

Unit GT-5 will employ the Best Available Control Technology (BACT) to reduce the emission of air pollutants. Specifically, GT-5 will utilize two primary means for the reduction of NO_X emissions. On the front end, GT-5

will rely on the use of demineralized water for the water injection directly into the combustor of the combustion turbine. On the back end, a selective catalytic reduction (SCR) catalyst with ammonia injection will be used. The emissions of CO and VOC will be controlled by a combination of built-in combustion and post-combustion (oxidation catalyst) controls. The GT-5 unit will need to undergo periodic tuning to maintain the water injection and intercooler system and the ammonia injection grid. See below for a discussion of these BACT technologies the proposed project will implement.

(1) Oxidizing Catalyst

To reduce the turbine CO emissions, Unit GT-5 will have an oxidizing catalyst, which is similar in concept to catalytic converters used in automobiles. The catalyst is usually coated with a noble metal, such as platinum, which will oxidize unburned hydrocarbons and CO to water vapor and carbon dioxide (CO_2). The CO catalyst is proposed to limit the CO concentrations exiting the Once Through Steam Generator (OTSG) stack

(2) Heat Recovery Boiler/OTSG

An essential part of the combined cycle power plant (Unit GT-5), the heat recovery boiler (also known as an OTSG) will be located to receive and capture in the form of steam the waste heat energy exhausted as hot gases from the gas turbine engine during normal operation. This steam will be produced as a result of pumping water through the heat recovery boiler's finned tubes, across the outside of which the hot gases flow, in a closed loop. The steam will be superheated and sent to a steam turbine generator, typical of many thermal power plant designs, and then will be collected from the exhaust end of the steam turbine to be returned back to the heat recovery boiler to be reused in the steam cycle. The boiler will use only the gas turbine waste heat and will not be supplementally fired, meaning there will be no extra energy added in the gas turbine exhaust path.

As a safety and operational reliability improvement, this particular heat recovery boiler will be equipped with special alloy tubes that will permit the operation of the gas turbine without the beneficial cooling effect of running water through the tubes. The boiler design intended for this project will be a OTSG which is a simpler design in the fact that there are no steam drums and no boiler blowdown. Water will enter the boiler near the exhaust stack and travel vertically downward, crisscrossing the vertically upward exhaust gases. It is expected that the OTSG will have a 125'-0" tall stack, similar to the existing gas turbine units.

The OTSG will employ a catalytic converter or SCR that will catalytically convert the air pollutants NOx and carbon monoxide to diatomic nitrogen (N_2), water (H_2O), and carbon dioxide (CO_2). The catalyst will be placed horizontally across the gas path for reduction of CO, and further upstream, ammonia (NH_3) vapor will be injected to reduce NOx as it comes in contact with the NOx catalyst.

(3) Selective Catalytic Reduction (SCR)

Selective catalytic reduction refers to a process that chemically reduces NOx by injecting ammonia into the flue gas stream over a catalyst in the presence of oxygen. The process is termed selective because the ammonia reducing agent preferentially reacts with NO_X rather than oxygen, producing inert nitrogen and water vapor. The performance and effectiveness of SCR systems are related to operating temperatures, which may vary with catalyst designs. Regardless of the type of catalyst used, efficient conversion of NOx to nitrogen and water vapor requires uniform mixing of ammonia into the exhaust gas stream. Also, the catalyst surface has to be large enough to ensure sufficient time for the reaction to take place.

(4) Continuous Emissions Monitoring System

The continuous emissions monitoring system (CEMS) will be located at the base of the OTSG to monitor the regulated constituents (CO, CO_2, NO_X, NH_3, VOCs, and particulate) of the gas turbine exhaust emitted from the plant on a continual basis and to record those emissions per the requirements of 40 CFR 60.[15] An electronic computer-based recording system, referred hereto as a "historian", is included to assure meeting Federal and State recording requirements for recording and record maintenance.

(5) Energy Efficiency

The proposed project will also implement various design features which will reduce the consumption of natural resources and the resultant criteria pollutant emissions from the control room component of the proposed project. The new administrative/control room, which will be housed within the existing Glenarm Building, consolidates administrative, maintenance, and control spaces to maximize use, efficiency, and security and will be constructed to achieve a reduction in energy usage when compared to the State's mandatory energy efficiency standards in accordance with the California Green Building Standards Code, as adopted by the City of Pasadena. Additionally, the new GT-5 unit would provide a replacement for the existing B-3 unit, which is aging and increasingly inefficient. Operation of the GT-5 unit will allow PWP to provide customers with more reliable, efficient, and environmentally sensitive power production.

In accordance with the California Green Building Standards Code, as set forth in the City of Pasadena Municipal Code Chapter 14.04.500 et seq. The ordinance requires applicable projects to comply with specified provisions to reduce energy consumption such as the use of low slope cool roofs and exceeding energy efficiency targets beyond regulatory requirements. The ordinance also supports the use of the United States Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED®) Green Building Rating System as a standard for which a project may be measured as a green building. The ordinance allows applicable projects the flexibility to comply with voluntary measures to achieve a certain number of equivalent LEED® points. The proposed administrative/control room would be approximately 18,000 square feet; therefore, it would be required to comply with Tier 2 standards. According to the CalGreen standards, nonresidential buildings should achieve at least a 15% reduction in energy usage when compared to the State's mandatory energy efficiency standards. The Tier 2 standards encourage, but do not require, nonresidential buildings to achieve a 30% reduction. Section 14.04.578 requires that Tier 2 projects achieve an equivalent of 50 LEED® points through compliance with required and voluntary measures. Due to the size of the project, compliance with the Tier 2 requirements of the Pasadena Green Building Standards is mandatory. Under the Green Building Standards, the renovation of the Glenarm Building to accommodate the control room as proposed under the project would be required to achieve an equivalent "Silver" rating from the USGBC's LEED® green building program.

Certain objectives and characteristics of the proposed project, as identified in the LEED® Checklist provided by the PWP would aid in reducing its GHG emissions and achieve the equivalent of a LEED® Silver rating. The following project features, consistent with Pasadena's Green Building Standards, have been accounted for in this analysis.

[15] *Code of Federal Regulations, Title 40, Protection of Environment, Part 60, Standards of Performance for New Stationary Sources.*

- The proposed project would reuse an existing building which would reduce waste and disposable construction. Any construction waste produced by the project would be reduced by recycling, reclaiming and reusing to reduce 95 percent of the material by weight, from the waste stream and disposal in the landfill. Building materials used would have a high recyclable content, such as structured steel with a 95 percent recycled content, be produced locally or those that contain rapidly renewable materials.
- The project is located close to existing public transportation lines and basic services are available within walking distance.
- The project would make use of low-flow water closets, waterless urinals, and high-efficiency metered faucets to reduce water use by at least 30% below baseline level of an equivalent commercial facility.
- The project would reduce lighting power demand by at least 20 percent and would evaluate the feasibility of implementing specific controls to dim or switch off lights based on available daylight and occupancy. The most energy efficient and cost effective HVAC equipment will be selected for the project and Energy Star eligible appliances and equipment would be used throughout.

d. Analysis of Project Impacts

AQ-1 Would the project conflict with or obstruct implementation of the applicable air quality plan?

The AQMP was prepared, assuming a region-specific level of growth, to reduce the high levels of pollutants within areas under the jurisdiction of SCAQMD, to return clean air to the region, and to minimize the impact of reduced air quality on the economy. As shown below, the repowering of B-3 would result in decreased daily maximum emissions of ozone precursors VOC and NO_X as compared to the baseline (current B3 operations), but increased daily emissions of non-attainment pollutants PM_{10} and $PM_{2.5}$. Consistency with the implementation of applicable air quality plans would be ensured or enhanced through compliance with the applicable SCAQMD regulations, programs, and policies highlighted in Section 3.1. As shown below, dispersion modeling performed in accordance with SCAQMD rules demonstrates that the increases in emissions do not result in ground-level concentrations in excess of ambient air quality standards.

The 2007 AQMP relies on assumptions and data regarding City of Pasadena's growth consistent with the applicable zoning under the existing General Plan. The proposed project does not result in new employment, and therefore would not conflict with any growth projections as presented in the 2007 AQMP. Furthermore, as shown below, construction and operation of the proposed project does not result in ambient levels in excess of applicable federal air quality standards. Therefore, the project would not conflict with or obstruct the 2007 AQMP and results in a less than significant impact.

AQ-2: Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?

The project site is located within the SoCAB which is characterized by relatively poor air quality. State and federal air quality standards are sometimes exceeded in many parts of the SoCAB, including those monitoring stations nearest to the project location. The proposed project is a replacement of an existing turbine unit (B-3) and would continue to contribute to local and regional air pollutant emissions. The new Unit GT-5 (GE LM 6000 or Rolls-Royce Trent 60) would be cleaner and more efficient than the existing Unit B-3, resulting in less pollutant emissions on a short-term (i.e. hourly) basis. However, Unit B-3 is operated

only intermittently as needed and the permit for Unit GT-5 seeks to allow a maximum of continuous operation. Thus the Potential to-Emit (PTE) of Unit GT-5 would increase emissions of pollutants with AAQSs established for long averaging times (i.e. annual).

As discussed above, the SCAQMD has established regional and localized emission thresholds, below which a project 's incremental increase is not expected to cause or contribute to an existing or projected Basin-wide or localized air quality violation. If the SCAQMD mass emission or localized significance thresholds are exceeded for emissions during project construction or operation, project -specific air quality dispersion modeling can be conducted to predict actual emissions at nearby sensitive receptors to determine if a significant impact would indeed occur or not. Dispersion modeling was conducted for this project to determine regional and local construction and operational impacts and the results are presented below.

(1) Regional Construction

The SCAQMD has established regional daily mass emission thresholds that address pollution sources associated with general construction activities, such as the use of on-site construction equipment, fugitive dust from site grading activities, and travel by construction workers. Project construction emissions were calculated using the CalEEMod model. The analysis assumed that construction activities would comply with applicable portions of SCAQMD Rule 403 regarding the control of fugitive dust. Commissioning emissions, which are different for the GE LM 6000 and Rolls-Royce Trent 60 configurations, were calculated with data provided by the City.

Construction emissions, which are the same for the GE LM 6000 and Rolls-Royce Trent 60, are presented in **Table 4.B-4**, *Estimate of Unmitigated Regional Construction Emissions*, utilizing a project -specific equipment mix and a construction schedule.[16] As indicated therein, the incremental increase in emissions from construction of the proposed project would not exceed SCAQMD mass emission thresholds construction for any of the pollutants studied (VOC, NO_X, CO, SO_X, PM_{10} and $PM_{2.5}$). Details of this analysis are available in **Appendix B** of this Draft EIR.

Emissions produced by the commissioning of the two different configurations of Unit GT-5 under consideration are presented separately from construction, as this phase would occur after construction is completed. Table 4.B-4 also presents commissioning emissions for the GE LM 6000 and the Rolls-Royce Trent 60. Commissioning emissions would occur for 12 days, 204 hours. Unit GT-5 would be running at different loads for 16-24 hours at a time during this commissioning phase. It will also use the AIG and WI and intercooler on and off during this time. These emissions were evaluated against the SCAQMD daily mass emission thresholds for construction. As shown in Table 4.B-4, the commissioning emissions from the GE LM 6000 and Rolls-Royce Trent 60 would exceed the SCAQMD daily mass emission thresholds for VOC, NO_X, CO, and $PM_{2.5}$. The SCAQMD mass emission thresholds would not be exceeded for SO_X and PM_{10}. It is important to remember that these emissions are a one-time, short-lived occurrence (12 days). However, as shown, commissioning of Unit GT-5 would result in maximum daily emissions that exceed the SCAQMD mass emission thresholds. To determine if the emissions would indeed cause a potentially significant impact,

[16] *In order to provide a conservative analysis, it is assumed that all construction activities would be completed in the minimum timeframe feasible. This is of particular importance as construction emissions are directly related to the intensity of construction activities, and significance criteria are established for emissions levels representing the "worst-case day." Actual construction may proceed at a less intensive pace, which would result in lower daily emissions.*

Table 4.B-4

Estimate of Unmitigated Regional Construction Emissions [a]
(pounds/day)

Stage	VOC	NO_X	CO	SO_X	PM_{10} [b]	$PM_{2.5}$
REGIONAL EMISSIONS						
Soil Remediation	3	23	11	<1	1	1
Export Haul Trucks	7	76	35	<1	21	4
Construction GT-5 (including import haul trucks)	13	99	60	<1	30	6
Construction Control Room	5	37	19	<1	3	2
Demolition	4	26	13	<1	2	1
Maximum Regional Daily Emissions	**13**	**99**	**60**	**<1**	**30**	**6**
SCAQMD Regional Daily Mass Emission Threshold	75	100	550	150	150	55
Over/(Under)	(65)	(29)	(505)	(150)	(137)	(51)
Exceed Daily Mass Emission Threshold?	**No**	**No**	**No**	**No**	**No**	**No**
Commissioning Emissions GE LM 6000	**213**	**1176**	**1176**	**18**	**92**	**92**
SCAQMD Regional Daily Mass Emission Threshold	75	100	550	150	150	55
Over (Under)	138	1076	626	(132)	(58)	37
Exceed Daily Mass Emission Threshold?	**Yes**	**Yes**	**Yes**	**No**	**No**	**Yes**
Commissioning Emissions Rolls-Royce Trent 60	**156**	**2374**	**1997**	**19**	**113**	**113**
SCAQMD Regional Daily Mass Emission Threshold	75	100	550	150	150	55
Over (Under)	81	2274	1447	(131)	(19)	58
Exceed Daily Mass Emission Threshold?	**Yes**	**Yes**	**Yes**	**No**	**No**	**Yes**
LOCALIZED CONSTRUCTION EMISSIONS						
Soil Remediation	3	23	11	<1	1	1
Construction GT-5	10	71	45	<1	13	4
Construction Control Room	4	33	17	<1	2	2
Demolition	4	26	13	<1	2	1
Maximum Localized Emissions	**10**	**71**	**45**	**<1**	**13**	**4**
Localized Significance Thresholds [c]	N/A	98	1256	N/A	23	6
Over/(Under) Threshold	N/A	(27)	(1211)	N/A	(10)	(2)
Exceed Localized Significance Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

[a] *Emission quantities are rounded to "whole number" values. As such, the "total" values presented herein may be one unit more or less than actual values.*
[b] *PM_{10} emissions estimates are based on compliance with SCAQMD Rule 403 requirements for fugitive dust suppression.*
[c] *The SCAQMD LSTs are based on Source Receptor Area 8 (West San Gabriel Valley) for a 2 acre site with sensitive receptors located further than or equal to 64 meters from the construction activity.*

Source: PCR Services Corporation, 2012.

project specific dispersion modeling for CO, NO_2, PM_{10}, and $PM_{2.5}$ was conducted for both configurations under consideration and the results of the analysis are discussed below under Localized Construction.

(2) Localized Construction

The localized construction emission thresholds, which are based on the construction site acreage and distance to the closest off-site sensitive receptor, were obtained for CO, NO_2, PM_{10}, and $PM_{2.5}$ from the LST look-up tables and are listed in Table 4.B-4. As shown in Table 4.B-4, daily maximum localized emissions would not exceed the SCAQMD daily significance thresholds for NO_X, CO, PM_{10}, or $PM_{2.5}$. Therefore, localized construction emissions would result in a less than significant impact with regard to ambient air quality standards.

As previously discussed, commissioning emissions of VOC, NO_X, CO and $PM_{2.5}$ would exceed the SCAQMD regional mass emission thresholds. Air dispersion modeling was performed to assess the potential for the emissions to cause impacts (i.e., violate the applicable ambient air quality standards) for NO_X, CO, and $PM_{2.5}$. It should be noted that ozone modeling cannot be performed to assess VOC emissions on a project-level basis. **Table 4.B-5**, *Air Dispersion Modeling Analysis for Commissioning Emissions*, shows the highest pollutant concentration produced by the 12 phases of commissioning.

Table 4.B-5

Air Dispersion Modeling Analysis for Commissioning Emissions

Configuration	NO_2 [a] ug/m^3	CAAQS ug/m^3	Significant?
GE LM 6000	221	338	No
Rolls-Royce Trent 60	303	338	No

Configuration	CO [a] ug/m^3	CAAQS ug/m^3	Significant?
GE LM 6000	4,607	23,000	No
Rolls-Royce Trent 60	4,655	23,000	No

Configuration	PM2.5 [b] ug/m^3	Allowable Increase ug/m^3	Significant?
GE LM 6000	1	2.5	No
Rolls-Royce Trent 60	1	2.5	No

[a] *One hour average concentrations represent the most stringent applicable standard for these pollutants.*
[b] *24 hour average standard is the most stringent standard for $PM_{2.5}$.*

Source: PCR Services Corporation, 2012.

As shown in Table 4.B-5, concentrations of NO_2 and CO produced by the commissioning of either the GE LM 6000 or Rolls-Royce Trent 60 turbine would be below the applicable CAAQS.[17] Emissions of $PM_{2.5}$ were predicted to result in negligible increases in 24-hour concentrations for either the GE LM 6000 or Rolls Royce Trent 60 configuration. Construction of the proposed project would result in temporary increases in air pollutants. Emissions from the soil remediation, demolition, and construction phases are not predicted to

[17] *Because commissioning is a short-term event, the CAAQS is the most stringent applicable standard. NAAQS values are based on the 98th percentile 1-hour value over a calendar year.*

exceed regional or localized thresholds. Commissioning emissions are predicted to exceed SCAQMD mass emission thresholds for VOC, NO_X, CO and $PM_{2.5}$.

Air dispersion modeling of NO_2, CO, SO_X and $PM_{2.5}$ emissions confirm that emissions would not result in violations of the most stringent CAAQS or NAAQS and therefore, would not result in a significant impact to regional or localized air quality. Therefore, while mass emissions (e.g., pounds per day) may exceed the daily limits, dispersion modeling of these emissions has determined that regional and local construction emissions would not violate an actual air quality standard and would not contribute significantly to an existing or projected air quality violation. Project impacts from construction would be less than significant.

(3) Regional Operation

To determine long-term impacts from implementation of the proposed project, emissions from the operation of the proposed project were analyzed against current emissions from the power plant. This baseline level was obtained from actual stack measurements of emissions from Unit B-3 or calculated based on usage data. The baseline also includes current mobile emissions from workers and delivery trucks.

As mentioned previously, two different configurations are being considered for Unit GT-5: GE LM 6000 and Rolls-Royce Trent 60. Three operational modes were analyzed for each configuration as worst-case scenarios for project operations: (1) normal operation (17°F, 100% load, without chiller) and 5 starts and 5 shutdowns, (2) water injection and intercooler tuning with normal operation (17°F, 100% load, without chiller), and (3) ammonia injection grid tuning with normal operation (17°F, 100% load, without chiller). Calculations of operational emissions used in the analyses from both configurations were from data provided by the project applicant via the manufacturers.

For analysis purposes, project emissions were subtracted from baseline emissions and the net change was calculated. This change was then compared against the SCAQMD operational daily mass emission thresholds. **Tables 4.B-6** and **4.B-7**, *Normal Operations 5 starts/shutoffs, Operational Emissions*, present results from the GE LM 6000 and Rolls-Royce Trent 60 configurations, respectively. As shown in Table 4.B-6, pollutant concentrations resulting from Normal Operations for the GE LM 6000 would exceed SCAQMD operational daily mass emission threshold for $PM_{2.5}$. Emissions for VOCs, NO_X, CO, SO_X, and PM_{10} were not exceeded for the GE LM 6000. Pollutant concentrations for the Rolls-Royce Trent 60 did not exceed the SCAQMD operational daily mass emission thresholds for any of the pollutants.

Tables 4.B-8 and **4.B-9**, *WI and Intercooler Tuning with Normal Operations, Operational Emissions*, present results from the GE LM 6000 and Rolls-Royce Trent 60 configurations, respectively. As shown in Tables 4.B-8 and 4.B-9, pollutant concentrations resulting from WI and Intercooler Tuning with Normal Operations would not exceed SCAQMD operational daily mass emission thresholds for VOCs, NO_X, CO, SO_X, PM_{10}, and $PM_{2.5}$.

Tables 4.B-10 and **4.B-11**, *AIG Tuning with Normal Operations, Operational Emissions*, present results from the GE LM 6000 and Rolls-Royce Trent 60 configurations, respectively. As shown in Tables 4.B-10 and 4.B-11, pollutant concentrations resulting from AIG Tuning with Normal Operations would not exceed SCAQMD operational daily mass emission thresholds for VOCs, NO_X, CO, SO_X, PM_{10}, and $PM_{2.5}$.

Table 4.B-6

GE LM 6000 Normal Operation 5 Starts/Shutoffs
Operational Emissions
(Pounds per Day)[a]

Emission Source	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$[c]
Existing Emissions						
Mobile	<1	<1	<1	<1	<1	<1
Stationary[b]	60	264	538	5	83	83
Total Existing (Baseline)	**60**	**264**	**538**	**5**	**83**	**83**
Project Regional Emissions						
Mobile Sources	<1	2	9	<1	2	<1
Area Sources	1	<1	<1	<1	<1	<1
Stationary Sources (Control Room)	<1	<1	<1	<1	<1	<1
Stationary Sources (Unit GT-5)	46	238	189	43	219	219
Total Project	**47**	**240**	**198**	**43**	**221**	**219**
Net Change	**-13**	**-24**	**-340**	**38**	**138**	**136**
SCAQMD Daily Mass Emission Threshold[c]	55	55	550	150	150	55
Exceed Daily Mass Emission Threshold?	**No**	**No**	**No**	**No**	**No**	**Yes**

[a] *Emission quantities are rounded to "whole number" values. As such, the "total" values presented herein may be one unit more or less than actual values.*

[b] *PM emissions from natural gas combustion are usually less than 1 micrometer in diameter, so we assumed that all PM_{10} emissions were also $PM_{2.5}$ emissions.*

[c] *The SCAQMD thresholds are the allowed incremental increase in project emissions (lbs/day) over baseline conditions which have been determined not to jeopardize Basin-wide clean air plans.*

Source: PCR Services Corporation, 2012.

The CalEEMod model was used to calculate stationary source emissions from the control room, mobile and area source emissions. Mobile source emissions are expected to increase minimally as the proposed project would not require additional employees. Area sources and natural gas emissions were calculated with CalEEMod outputs. As mentioned above, stationary source emissions for the two GT-5 configurations were provided by the project applicant.

Tables 4.B-6, 4.B-8 and 4.B-10 demonstrate that pollutant emissions resulting from project operations would not exceed SCAQMD regional operational daily mass emission thresholds for any pollutant, except for $PM_{2.5}$ for the GE LM 6000 under Normal Operations 5 starts/shutoffs. Emissions from the GE LM 6000 for WI and intercooling tuning with normal operation and AIG tuning with normal operation would not exceed the SCAQMD daily mass emission thresholds for any of the pollutants studied. Therefore, the GE LM 6000 turbine has the potential to violate the $PM_{2.5}$ air quality standard. Refined dispersion modeling was used to determine if the GE LM 6000 turbine would contribute significantly to an existing or projected air quality violation when operating under normal operations with 5 starts/shutoffs and the results of the analysis are discussed below under Localized Operation.

Table 4.B-7

Rolls-Royce Trent 60 Normal Operation 5 Starts/Shutoffs
Operational Emissions
(Pounds per Day)[a]

Emission Source	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$[c]
Existing Emissions						
Mobile	<1	<1	<1	<1	<1	<1
Stationary[b]	60	264	538	5	83	83
Total Existing (Baseline)	**60**	**264**	**538**	**5**	**83**	**83**
Project Regional Emissions						
Mobile Sources	<1	2	9	<1	2	<1
Area Sources	1	<1	<1	<1	<1	<1
Stationary Sources (Control Room)	<1	<1	<1	<1	<1	<1
Stationary Sources (Unit GT-5)[b]	56	256	240	20	119	119
Total Project	**57**	**258**	**249**	**20**	**121**	**119**
Net Change	**-3**	**-6**	**-289**	**15**	**38**	**36**
SCAQMD Daily Mass Emission Threshold[d]	55	55	550	150	150	55
Exceed Daily Mass Emission Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

[a] *Emission quantities are rounded to "whole number" values. As such, the "total" values presented herein may be one unit more or less than actual values.*
[b] *Emissions were provided by project applicant.*
[c] *$PM_{2.5}$ emissions were not provided by the project applicant. PM emissions from natural gas combustion are usually less than 1 micrometer in diameter, so we assumed that all PM_{10} emissions were also $PM_{2.5}$ emissions.*
[d] *The SCAQMD thresholds are the allowed incremental increase in project emissions (lbs/day) over baseline conditions which have been determined not to jeopardize Basin-wide clean air plans.*

Source: PCR Services Corporation, 2012.

Tables 4.B-7, 4.B-9 and 4.B-11 demonstrate that pollutant emissions from the Rolls-Royce Trent 60 would not result in an exceedance of the SCAQMD daily mass emission thresholds for any scenario. Therefore, no violation to any air quality standards would occur and emissions would not contribute significantly to an existing or projected air quality impact for the Rolls-Royce Trent 60 configuration.

(4) Localized Operation

Due to the increase in $PM_{2.5}$ emissions (see Table 4.B-6) in excess of the SCAQMD mass emission threshold, air dispersion modeling was performed to analyze potential impacts to ground level pollutant concentrations. Even though the increases in air emissions for all pollutants expect $PM_{2.5}$ were calculated to be less than the CEQA thresholds, air dispersion modeling was also performed for those pollutants in support of the permit application. As shown in **Table 4.B-12**, *Air Dispersion Modeling Analysis for NOx Emissions*, operational NOx emissions from all scenarios occurring during the operation of Unit GT-5 would result in a maximum ground-level NO_2 concentration (project impact + exiting ambient) of 220 ug/m^3, one-

Table 4.B-8

GE LM 6000 WI & Intercooler Tuning with Normal Operation
Operational Emissions
(Pounds per Day)[a]

Emission Source	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$[c]
Existing Emissions						
Mobile	<1	<1	<1	<1	<1	<1
Stationary[b]	60	264	538	5	83	83
Total Existing (Baseline)	**60**	**264**	**538**	**5**	**83**	**83**
Project Regional Emissions						
Mobile Sources	<1	2	9	<1	2	<1
Area Sources	1	<1	<1	<1	<1	<1
Stationary Sources (Control Room)	<1	<1	<1	<1	<1	<1
Stationary Sources (Unit GT-5)[b]	29	272	62	17	96	96
Total Project	**30**	**274**	**71**	**17**	**98**	**96**
Net Change	**-30**	**10**	**-467**	**12**	**15**	**13**
SCAQMD Daily Mass Emission Threshold[d]	55	55	550	150	150	55
Exceed Daily Mass Emission Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

[a] *Emission quantities are rounded to "whole number" values. As such, the "total" values presented herein may be one unit more or less than actual values.*
[b] *Emissions were provided by project applicant..*
[c] *$PM_{2.5}$ emissions were not provided by the project applicant. PM emissions from natural gas combustion are usually less than 1 micrometer in diameter, so we assumed that all PM_{10} emissions were also $PM_{2.5}$ emissions.*
[d] *The SCAQMD thresholds are the allowed incremental increase in project emissions (lbs/day) over baseline conditions which have been determined not to jeopardize Basin-wide clean air plans.*

Source: PCR Services Corporation, 2012.

hour average, well below the CAAQS standard of 330 ug/m^3, and a maximum ground-level concentration of 135 ug/m^3, one-hour average 98th percentile, below the NAAQS standard of 188 ug/m^3 for either the GE LM 6000 or Rolls-Royce Trent 60 turbine. Therefore, operation of Unit GT-5 would not cause a violation of applicable NO_2 standards.

Dispersion analysis performed for CO and PM_{10} shows that emissions of CO and PM_{10} would not result in exceedance of short-term ambient air quality standards. As shown in **Table 4.B-13**, *Air Dispersion Modeling Analysis for CO and PM_{10} Emissions*, operational emissions from all scenarios occurring during the operation of Unit GT-5 with either configuration would be below the standards and would not result in a significant impact.

Table 4.B-14, *Annual Operation Emissions for Unit GT-5*, compares the annual emissions expected for the GE LM 6000 and Rolls-Royce Trent 60 turbines with current existing emissions from Unit B-3. As shown in the

Table 4.B-9

Rolls-Royce Trent 60 WI & Intercooler Tuning with Normal Operation
Operational Emissions
(Pounds per Day)[a]

Emission Source	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$[c]
Existing Emissions						
Mobile	<1	<1	<1	<1	<1	<1
Stationary[b]	60	264	538	5	83	83
Total Existing (Baseline)	**60**	**264**	**538**	**5**	**83**	**83**
Project Regional Emissions						
Mobile Sources	<1	2	9	<1	2	<1
Area Sources	1	<1	<1	<1	<1	<1
Stationary Sources (Control Room)	<1	<1	<1	<1	<1	<1
Stationary Sources (Unit GT-5)[b]	48	292	134	18	120	120
Total Project	**49**	**294**	**143**	**18**	**122**	**120**
Net Change	**-11**	**30**	**-395**	**13**	**39**	**37**
SCAQMD Daily Mass Emission Threshold[d]	55	55	550	150	150	55
Exceed Daily Mass Emission Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

[a] *Emission quantities are rounded to "whole number" values. As such, the "total" values presented herein may be one unit more or less than actual values.*
[b] *Emissions were provided by project applicant..*
[c] *$PM_{2.5}$ emissions were not provided by the project applicant. PM emissions from natural gas combustion are usually less than 1 micrometer in diameter, so we assumed that all PM_{10} emissions were also $PM_{2.5}$ emissions.*
[d] *The SCAQMD thresholds are the allowed incremental increase in project emissions (lbs/day) over baseline conditions which have been determined not to jeopardize Basin-wide clean air plans.*

Source: PCR Services Corporation, 2012.

table, emissions for CO are less than existing emissions from Unit B-3, while VOC, NO_X, SO_X, PM_{10} and $PM_{2.5}$ are higher than existing emissions. There are no annual mass emission thresholds and no annual ambient air standards for ozone or $PM_{2.5}$. Thus, dispersion modeling was conducted to analyze the impacts of the annual increases in NO_X and PM_{10} emissions.

Dispersion analysis performed for NO_X, and PM_{10} shows that annual emissions would not result in violations of annual ambient air quality standards. As shown in **Table 4.B-15**, *Air Dispersion Modeling Analysis for NO_X, and PM_{10} Annual Emissions*, operational emissions from all scenarios occurring during the operation of Unit GT-5 with either configuration would be below the applicable standards and would not result in a significant impact.

Based on the above discussion, construction and operation of the GE LM 6000 or Rolls-Royce Trent 60 turbine would not result in violations of applicable air quality standards or contribute substantially to an

Table 4.B-10

GE LM 6000 AIG Tuning with Normal Operation
Operational Emissions
(Pounds per Day)[a]

Emission Source	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$[c]
Existing Emissions						
Mobile	<1	<1	<1	<1	<1	<1
Stationary[b]	60	264	538	5	83	83
Total Existing (Baseline)	**60**	**264**	**538**	**5**	**83**	**83**
Project Regional Emissions						
Mobile Sources	<1	2	9	<1	2	<1
Area Sources	1	<1	<1	<1	<1	<1
Stationary Sources (Control Room)	<1	<1	<1	<1	<1	<1
Stationary Sources (Unit GT-5)[b]	29	290	63	19	96	96
Total Project	**30**	**292**	**72**	**19**	**98**	**96**
Net Change	**-30**	**28**	**-466**	**14**	**15**	**13**
SCAQMD Daily Mass Emissione Threshold[d]	55	55	550	150	150	55
Exceed Daily Mass Emission Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

[a] *Emission quantities are rounded to "whole number" values. As such, the "total" values presented herein may be one unit more or less than actual values.*
[b] *Emissions were provided by project applicant..*
[c] *$PM_{2.5}$ emissions were not provided by the project applicant. PM emissions from natural gas combustion are usually less than 1 micrometer in diameter, so we assumed that all PM_{10} emissions were also $PM_{2.5}$ emissions.*
[d] *The SCAQMD thresholds are the allowed incremental increase in project emissions (lbs/day) over baseline conditions which have been determined not to jeopardize Basin-wide clean air plans.*

Source: PCR Services Corporation, 2012.

existing or projected air quality violation. Construction emissions would not exceed regional daily mass emission or localized significance thresholds. Commissioning emissions would exceed SCAQMD daily mass emission thresholds for VOC, NOx, CO and $PM_{2.5}$; however, dispersion modeling demonstrated that no violations of applicable short-term ambient air standards would occur during commissioning. Maximum daily operational VOC, NO_X, CO, and SO_X emissions decrease compared to existing conditions (Unit B-3). The increase in $PM_{2.5}$ emissions from normal operation of the GE LM 6000 exceeds SCAQMD mass emission thresholds. Although emissions of PM10 also increased, the incremental increase is not predicted to exceed applicable SCAQMD mass emission thresholds. Project-specific air dispersion modeling demonstrated that the increases in daily maximum regional and local emissions from construction and operations would not violate an air quality standard and would not contribute significantly to an existing or projected air quality violation. Therefore, project impacts from construction and operations are less than significant.

AQ-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

Table 4.B-11

Rolls-Royce Trent 60 AIG Tuning with Normal Operation
Operational Emissions
(Pounds per Day)[a]

Emission Source	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$[c]
Existing Emissions						
Mobile	<1	<1	<1	<1	<1	<1
Stationary	60	264	538	5	83	83
Total Existing (Baseline)	**60**	**264**	**538**	**5**	**83**	**83**
Project Regional Emissions						
Mobile Sources	<1	2	9	<1	2	<1
Area Sources	1	<1	<1	<1	<1	<1
Stationary Sources (Control Room)	<1	<1	<1	<1	<1	<1
Stationary Sources (Unit GT-5)	43	306	119	19	120	120
Total Project	**44**	**308**	**128**	**19**	**122**	**120**
Net Change	**-16**	**44**	**-410**	**14**	**39**	**37**
SCAQMD Daily Mass Emission Threshold[c]	55	55	550	150	150	55
Exceed Daily Mass Emission Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

[a] *Emission quantities are rounded to "whole number" values. As such, the "total" values presented herein may be one unit more or less than actual values.*

[b] *$PM_{2.5}$ emissions were not provided by the project applicant. PM emissions from natural gas combustion are usually less than 1 micrometer in diameter, so it is assumed that all PM_{10} emissions also represent $PM_{2.5}$ emissions.*

[c] *The SCAQMD thresholds are the allowed incremental increase in project emissions (lbs/day) over baseline conditions which have been determined not to jeopardize Basin-wide clean air plans.*

Source: PCR Services Corporation, 2012.

quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?

The proposed project would result in the emission of criteria pollutants for which the project area is in non-attainment during both construction and operation. A significant impact may occur if a project would add a cumulatively considerable contribution of a federal or state non-attainment pollutant. The SoCAB is currently in non-attainment for ozone, PM_{10}, and $PM_{2.5}$.

As stated above, the emissions from construction of the project are not predicted to exceed any applicable SCAQMD regional or local impact threshold. Commissioning emissions, for both the GE LM 6000 and Rolls-Royce Trent 60, would exceed the SCAQMD daily mass emission thresholds for VOC, NO_X, and $PM_{2.5}$. Project-specific construction air dispersion modeling as shown in Table 4.B-15, demonstrate that NO_X, and $PM_{10}/PM_{2.5}$ emissions do not result in ambient concentrations which exceed applicable NAAQS or CAAQS. Therefore, the project would not result in considerable cumulative concentration and would result in a less

Table 4.B-12

Air Dispersion Modeling Analysis for NOx Emissions[a] (ug/m^3, 1-hour analysis)

Configuration	Operations						
	CAAQS Analysis						
	Startup	Normal Operation	Shutdown	WI and Intercooler Tuning	AIG Tuning	Threshold	Significant?
GE	215	208	211	217	214	339	No
RR	216	209	216	220	216	339	No
	NAAQS Analysis[b]						
GE	132	129	131	135	133	188	No
RR	132	129	132	133	132	188	No

[a] *Emission quantities are rounded to "whole number" values. As such, the "total" values presented herein may be one unit more or less than actual values.*

[b] *To attain this standard, only the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 188 ug/m^3 (effective January 22, 2010).*

Source: PCR Services Corporation, 2012.

Table 4.B-13

Air Dispersion Modeling Analysis for CO and PM_{10}[a] Emissions (ug/m^3)[a]

		CO (1-hour)[b]		PM_{10}[b] (24-hour)	
Configuration:		**GE**	**RR**	**GE**	**RR**
Operations	**Normal Operation**	4,582	4,582	0.97	0.70
	Startup	4,590	4,594	0.94	0.60
	Shutdown	4,585	4,586	0.94	0.62
	WI and Intercooler Tuning	4,583	4,589	0.96	0.64
	AIG Tuning	4,582	4,585	0.93	0.60
	Ambient Air Quality Standard	**23,000**		**2.50**	
	Significant?	**No**	**No**	**No**	**No**

[a] *Emission quantities are rounded to "whole number" values. As such, the "total" values presented herein may be one unit more or less than actual values.*

[b] *$PM_{2.5}$ emissions were not provided by the project applicant. PM emissions from natural gas combustion are usually less than 1 micrometer in diameter, so it is assumed that all PM_{10} emissions also represent $PM_{2.5}$ emissions.*

Source: PCR Services Corporation, 2012.

than significant impact for construction emissions for both the GE LM 6000 and Rolls-Royce Trent 60 turbines.

Table 4.B-14

Annual Operations Emissions for Unit GT-5
(tons/yr)

GE LM 6000 - Annual Emissions (tons/yr)

	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Normal Operations	6	17	10	3	18	18
WI & Intercooling Tuning	0	0	0	0	0	0
AIG Tuning	0	0	0	0	0	0
Total GE LM 6000	**6**	**17**	**10**	**3**	**18**	**18**
Existing B-3 Emissions	1	5	20	0.1	2	2
Net change	**5**	**12**	**-10**	**3**	**16**	**16**

Rolls-Royce Trent 60 - Annual Emissions (tons/yr)

	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Normal Operations	7	19	11	4	22	22
WI & Intercooling Tuning	0	0	0	0	0	0
AIG Tuning	0	0	0	0	0	0
Total Rolls-Royce Trent 60	**7**	**19**	**11**	**4**	**22**	**22**
Existing B-3 Emissions	1	5	20	0.1	2	2
Net change	**6**	**14**	**-9**	**4**	**20**	**20**

Source: PCR Services Corporation, 2012.

Normal maximum daily operations (5 starts/shutdowns) of the GE LM 6000 or Rolls-Royce Trent 60 results in decreases in ozone precursors, but increases in PM_{10} and $PM_{2.5}$ emissions. Only the potential increase in daily $PM_{2.5}$ emissions from the GE LM 6000 would exceed the SCAQMD daily mass emission threshold. Project-specific air dispersion modeling as shown in Tables 4.B-12 and 4.B-13 above, demonstrate that $PM_{2.5}$ emissions do not result in ground level concentrations in excess of applicable NAAQS or CAAQS. Therefore, operation of the project would not result in a cumulatively considerable net increase of criteria pollutants (VOC, NO_X, PM10, and $PM_{2.5}$), for which the project is in non-attainment. The proposed project would result in a less than significant impact for operational emissions for both the GE LM 6000 and Rolls-Royce Trent 60 turbines.

AQ-4: Would the project expose sensitive receptors to substantial pollutant concentrations?

Some population groups, such as children, the elderly, and acutely ill and chronically ill persons, especially those with cardio-respiratory diseases, are considered more sensitive to air pollution than others. The proposed project is located in the City of Pasadena, in an urban area with sensitive receptors. The nearest sensitive receptors to the project site are: single family residences approximately 64 meters to the west across Fair Oaks Avenue; multi-family residential approximately 130 meters to the south of the project site; and Blair High School approximately 197 meters east.

Table 4.B-15

Air Dispersion Modeling Analysis for NO_X and PM_{10}[a] Annual Emissions (ug/m^3)

NOx Annual Arithmetic Mean (µg/m^3)

	Modeled Conc.	Background	Total	CAAQS	Significant?
GE	0.13	44.2	44.3	56	No
RR	0.13	44.2	44.3	56	No

PM_{10} Annual Arithmetic Mean (µg/m^3)

	2005	2006	2007	2008	2009	CAAQS	Significant?
GE	--	0.17	0.16	0.14	0.13	20	No
RR	0.19	0.17	0.15	0.14	0.13	20	No

Source: PCR Services Corporation, 2012.

[a] *$PM_{2.5}$ emissions were not provided by the project applicant. PM emissions from natural gas combustion are usually less than 1 micrometer in diameter, so it is assumed that all PM_{10} emissions also represent $PM_{2.5}$ emissions. The annual CAAQS for $PM_{2.5}$ is 12 µg/m^3.*

The project would implement best management practices to minimize dust creation and minimize air pollutants. Compliance with SCAQMD Rule 403 would require the applicant to utilize one or more of the best available control measures identified in the tables within the rule. Examples of these measures include but are not limited to pre-watering of soils prior to cut and fill activities, stabilizing stockpiled materials, and directing construction traffic to established haul routes.

The potential for the proposed project to result in exposure of sensitive receptors to substantial criteria pollutant concentrations is discussed in detail above. Project construction and operation is not expected to significantly impact any offsite sensitive land uses.

(5) Construction

The greatest potential for construction-generated TAC emissions would be related to diesel particulate emissions associated with heavy equipment operations during grading and excavation activities. In addition, incidental amounts of toxic substances such as oils, solvents, and paints would be used. The use of these substances would comply with all applicable SCAQMD rules for their manufacture and application. According to SCAQMD methodology, health effects from carcinogenic air toxics are usually described in terms of individual cancer risk. "Individual Cancer Risk" is the likelihood that a person exposed to concentrations of TACs over a 70-year lifetime will contract cancer, based on the use of standard risk-assessment methodology. Given the relatively short-term construction schedule of the proposed project, construction would not result in a long-term (i.e., 70 years) substantial source of TAC emissions with no residual emissions after construction and corresponding individual cancer risk. As such, project -related toxic emission impacts during construction would not be significant.

(6) Operation

The installation of equipment with the potential to emit TACs must demonstrate, in accordance with SCAQMD Rule 1401, that no off-site sensitive receptors be exposed to health risks in excess of the

significance criteria discussed above. An HRA was conducted to evaluate the carcinogenic risk to residents and workers resulting from exposure to localized sources of TACs during operation of the project. The threshold for significance used to evaluate the exposure to TACs is one cancer case per one million people, according to District Rule 1401.

Routine TAC emissions would result from the combustion of natural gas in the turbine and from the cooling tower. TACs include ammonia, 1,3-butadiene, and acetaldehyde to name a few Details are presented in **Appendix B** of this Draft EIR.

As shown in **Table 4.B-16**, *Summary of Cancer Risk Assessment Results for GE LM 6000,* , the results of this analysis for the GE LM 6000 configuration yields a maximum individual cancer risk of 0.07 in a million for residents and 0.02 per million for workers. Both are well below the Rule 1401 threshold of one cancer case in a million people as a significant cancer risk. As discussed previously, residential receptors are the nearest sensitive receptors to the project site and represent a worst-case scenario. Therefore, the results of the HRA are applicable to the student and school employee receptors at Blair High School, who are located farther away and potentially exposed to the project TAC emissions for shorter durations (180 and 240 days per year, respectively).

Table 4.B-16

Summary of Cancer Risk Assessment Results for GE LM 6000

Receptor Type	Maximum Individual Cancer Risk (per million)	Rule 1401 Threshold (per million)	Significant?
Resident	0.07	1	No
Worker	0.02	1	No

Source: PCR Services Corporation, 2012

The HRA also estimates non-cancer risk by calculating both chronic and acute hazard indices (HI) following the SCAQMD health risk assessment guidelines, which recommends a significance threshold of 1.0. The maximum chronic HI was estimated at 0.002 for both resident and worker receptors, well below the threshold of 1.0. Also indicated therein, the analysis estimates a maximum acute HI of 0.003 for resident receptors and 0.002 for worker receptors, which again are both below the significance threshold. Therefore, operation of the proposed project using the GE LM 6000 turbine would result in less than significant impacts with respect to emissions of TACs.

As shown in **Table 4.8-17**, *Summary of Cancer Risk Assessment Results for Rolls-Royce Trent 60,* , the results of the HRA for the Rolls-Royce Trent 60 configuration yields a maximum individual cancer risk of 0.05 in a million for residents and 0.01 per million for workers at the project site. Both are well below the Rule 1401 threshold of one cancer case in a million people as a significant cancer risk.

Table 4.B-17

Summary of Cancer Risk Assessment Results for Rolls-Royce Trent 60

Receptor Type	Maximum Individual Cancer Risk (per million)	Rule 1401 Threshold (per million)	Significant?
Resident	0.05	1	No
Worker	0.01	1	No

Source: PCR Services Corporation, 2012

The maximum chronic HI was estimated at 0.001 for residents and 0.001 for worker receptors, well below the threshold of 1.0. Also indicated therein, the analysis estimates a maximum acute HI of 0.003 for resident receptors and 0.002 for worker receptors, which again are both below the significance threshold. Therefore, operation of the proposed project using the Rolls-Royce Trent 60 turbine would also result in less than significant impacts with respect to emissions of TACs.

Implementation of the proposed project would not introduce substantial emissions of diesel particulate matter (DPM) from idling vehicles as very few would be required for operations. In 2004, CARB adopted an Airborne Toxic Control Measure (ATCM) to limit heavy duty diesel motor vehicle idling in order to reduce public exposure to diesel PM and other TACs and air pollutants. The measure applies to diesel-fueled commercial vehicles with gross vehicle weight ratings greater than 10,000 pounds which are licensed to operate on highways, regardless of where they are registered. This measure does not allow diesel fueled commercial vehicles to idle for more than five minutes at any given time. Potential localized air toxic impacts from on-site sources of diesel particulate emissions would be minimal since only a limited number of heavy-duty trucks would access the project site (deliveries, trash removal, etc.), and the trucks that do visit the site would not idle on the project site for extended periods of time. Based on the limited activity of the TAC sources by vehicles, potential air toxic impacts to off-site populations would be less than significant.

Dispersion modeling verifies that increases in emissions from either the GE or Rolls-Royce configurations proposed for GT-5 as compared to B-3 would not result in concentrations of criteria pollutants in excess of standards. Construction and operation of both turbine configurations for the proposed Unit GT-5 are predicted to result in less than significant impacts in terms of TAC emissions. Therefore, the proposed project is not predicted to result in exposure of sensitive receptors to substantial concentrations.

(7) CO Hot Spots

The SCAQMD recommends an evaluation of potential localized CO impacts when vehicle to capacity (V/C) ratios are increased by two percent or more at intersections with a level of service (LOS) of C or worse or when LOS declines from A through C to D or worse. The proposed project would result in a minimal increase in vehicular traffic compared to current practices and would not cause substantial changes in V/C ratios or LOS declines. As shown previously in Table 4.B-3, CO levels in the project area are substantially below the federal and state standards. Table 4.B-3 indicates that the maximum CO levels in recent years are 4 ppm (1-hour average) and 2.8 ppm (8-hour average) compared to the thresholds of 20 ppm (1-hour average) and 9.0 (8-hour average). Thus, it is not expected that CO levels at project-impacted intersections would rise to such a degree as to cause an exceedance of these standards.

Furthermore, the SCAQMD conducted CO modeling for the 2003 AQMP for four intersections considered the worst-case intersections in the South Coast Air Basin. These intersections included: (a) Wilshire Boulevard and Veteran Avenue; (b) Sunset Boulevard and Highland Avenue; (c) La Cienega Boulevard and Century Boulevard; (d) Long Beach Boulevard and Imperial Highway.

In the 2003 AQMP, the SCAQMD notes that the intersection of Wilshire Boulevard and Veteran Avenue is the the most congested intersection in Los Angeles County with an average daily traffic volume of about 100,000 vehicles per day.[18] This intersection is located near the on- and off-ramps to Interstate 405 in West Los Angeles. The evidence provided in Table 4-10 of Appendix V of the 2003 AQMP shows that the peak modeled CO concentration due to vehicle emissions at these four intersections was 4.6 ppm (1-hour average) and 3.2 (8-hour average) at Wilshire Boulevard and Veteran Avenue.[19] When added to the existing background CO concentrations in the project area, these values would be 8.6 ppm (1-hour average) and 6.0 ppm (8-hour average).

None of the intersections in the project area have peak hour traffic volumes that exceed those at the intersections modeled in the 2003 AQMP nor do they have any geometric qualities that would result in higher concentrations than the intersections modeled by the SCAQMD. As a result, CO concentrations are expected to be less than 7.6 ppm (1-hour average) and 5.2 ppm (8-hour average), which would not exceed the thresholds. Thus, this comparison provides evidence that the project would not contribute to the formation of CO hotspots and no further CO analysis is required. Therefore, the project would result in less than significant impacts with respect to CO hotspots.

AQ-5 Would the project create objectionable odors affecting a substantial number of people?

According to the SCAQMD *CEQA Air Quality Handbook*, land uses associated with odor complaints typically include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. The proposed project does not include any uses identified by SCAQMD as being associated with odors. Potential sources that may emit odors during construction activities include the use of architectural coatings and solvents. SCAQMD Rule 1113 limits the amount of volatile organic compounds from architectural coatings and solvents. Via mandatory compliance with SCAQMD Rules, no construction activities or materials are proposed which would create objectionable odors. Therefore, no impact would occur and no mitigation measures would be required.

Operation of the proposed project would not essentially change from current operations. Natural gas is odorless, but gas suppliers odorize natural gas as a safety measure so that its presence is detectable to humans. Odor complaints have been received periodically by the public and PWP has determined that the cause was small quantities of natural gas which posed no health or safety concern to the plant or the public. No new sources of odors are proposed, and operations would remain largely the same as with B-3. Therefore, no impact would occur from operations and no mitigation measures would be required.

[18] *South Coast Air Quality Management District,* 2003 Air Quality Management Plan*, Appendix V: Modeling and Attainment Demonstrations, (2003) V-4-24.*

[19] *The 8-hour average is based on a 0.7 persistence factor, as recommended by the SCAQMD.*

3. MITIGATION MEASURES

The proposed project would have less than significant or no impact with incorporation of project design features. Therefore, no mitigation measures are required.

4. CUMULATIVE IMPACTS

As discussed in Section 3.0, Environmental Setting, the development of 32 related projects is anticipated in the City. As shown in **Figure 3-1,** *Related Projects Location Map*, of this Draft EIR, the nearest related project and the only other project within the South Fair Oaks Specific Plan area, the Huntington Memorial Hospital Master Plan Project, is approximately .30 miles from the project site.

a. Construction

With respect to the project's construction-period air quality emissions and cumulative Basin-wide conditions, the SCAQMD has developed strategies to reduce criteria pollutant emissions outlined in the 2007 AQMP pursuant to Federal CAA mandates. As such, the proposed project would comply with SCAQMD Rule 403 requirements, and implement all feasible mitigation measures. In addition, the proposed project would comply with adopted AQMP emissions control measures. Per SCAQMD rules and mandates as well as the CEQA requirement that significant impacts be mitigated to the extent feasible, these same requirements (i.e., Rule 403 compliance, the implementation of all feasible mitigation measures, and compliance with adopted AQMP emissions control measures) would also be imposed on construction projects Basin-wide.

As indicated above, the incremental increase in emissions from construction of the implementing project would not exceed SCAQMD regional daily mass emission and localized significance thresholds for VOC, NOx, CO, SOx, PM_{10} and $PM_{2.5}$, but would exceed the SCAQMD daily mass emission thresholds for VOC, NOx, CO, and $PM_{2.5}$ during commissioning. Project-specific localized modeling was conducted and the results show that violations of applicable ambient air quality standards are not expected. Emissions of TAC and odorous compounds during construction would also result in less than significant impacts.

The related projects are located at a considerable distance from the Glenarm Plant; the nearest related project is a master plan and general plan amendment and zone change at 100 West California Boulevard, approximately 1,700 feet northwest of the project site. At that distance from an emission source, pollutants are highly dispersed and unlikely to impact localized ground level concentrations noticeably. Although likely that construction of some of the related projects may overlap with the proposed project, it is highly speculative at this point in time. Therefore, impacts from the related projects' construction emissions, even if simultaneous to the proposed project's construction schedule, would not contribute to an impact at nearby receptors.

CEQA Guidelines Section 15064 provides guidance on determining the significance of the environmental effects caused by a project. Specifically, CEQA Guidelines Section 15064(h)(1) states, in part, that:

> *"…'Cumulative considerable' means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects."*

Because the project does not cause significant regional or localized impacts, project construction emissions would not be considered cumulatively considerable. As such, cumulative impacts to air quality during proposed project construction would be less than significant.

b. Operation

A significant impact may occur if a project would add a cumulatively considerable contribution of a federal or state non-attainment pollutant. The Basin is currently in nonattainment for ozone, PM_{10} and $PM_{2.5}$, and similar to the proposed project, the related projects may result in increases in those pollutants.

CEQA Guidelines Sections 15064(h)(3) provides guidance in determining the significance of cumulative impacts. Specifically, Section 15064(h)(3) states in part that:

> *"A lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan or mitigation program which provides specific requirements that will avoid or substantially lessen the cumulative problem (e.g., water quality control plan, air quality plan, integrated waste management plan) within the geographic area in which the project is located. Such plans or programs must be specified in law or adopted by the public agency with jurisdiction over the affected resources through a public review process to implement, interpret, or make specific the law enforced or administered by the public agency…"*

For purposes of the cumulative air quality analysis with respect to CEQA Guidelines Section 15064(h)(3), the project's incremental contribution to cumulative air quality impacts is determined based on compliance with the SCAQMD adopted 2007 AQMP, SCAQMD Rules and Regulations as discussed above and the City of Pasadena's IRP.

As discussed above, the project would not result in population and/or employment growth that exceeds growth estimates in the AQMP. The project would comply with all rules and regulations as implemented by the SCAQMD and the CARB, and would conform to the goals of the IRP. Therefore, it is determined that the proposed project is consistent with the all applicable plans, rules and regulations. Thus, given the project's consistency with the air quality plans, the project's incremental contribution to cumulative air quality effects is not cumulatively considerable, per CEQA Section 15064(h)(3).

Nonetheless, SCAQMD no longer recommends relying solely upon consistency with the AQMP and other air quality plans as an appropriate methodology for assessing cumulative air quality impacts. Instead, SCAQMD's approach to determining cumulative air quality impacts for criteria air pollutants is to first determine whether or not the proposed project would result in a significant project-level impact to regional air quality based on SCAQMD significance thresholds. The SCAQMD recommends that project specific air quality impacts be used to determine the potential cumulative impacts to regional air quality. For operations, the GE LM 6000 exceeds the regional $PM_{2.5}$ SCAQMD for normal operation with 5 starts/shutdowns. Operations utilizing the Rolls-Royce Trent 60 do not exceed any SCAQMD regional daily mass emission thresholds. To determine localized effects, project specific air dispersion modeling as shown in Tables 4.B-12 and 4.B-13, above, show that NO_X, CO, and $PM_{10}/PM_{2.5}$ emissions would not exceed the applicable NAAQS or CAAQS. Therefore, operation of the project would not result in a cumulatively considerable net increase of criteria pollutants, NO_X, CO, and $PM_{10}/PM_{2.5}$, for which the project is in non-

attainment and would result in a less than significant impact for operational emissions for the Rolls-Royce Trent 60 turbine. The GE LM 6000 turbine only exceeds the SCAQMD threshold in $PM_{2.5}$; however, as shown by project specific air dispersion modeling, $PM_{2.5}$ emissions would result in less than significant cumulative impacts for operations. Therefore, because project specific operational emissions would not cause significant impacts at or beyond the project boundary, pursuant to CEQA Guidelines Section 15064(h)(1), the project's operational emissions would not overlap with emissions from related projects and are not considered to be cumulatively considerable. Therefore, the emissions of non-attainment pollutants and precursors generated by project operation in excess of the SCAQMD project-level mass emission thresholds would be cumulatively less than significant.

With respect to TAC emissions, project specific modeling was conducted to determine the Individual Cancer Risk of TAC emissions associated with both models of the GT-5 turbine. As shown in Table 4.B-16, the results of this analysis for the GE LM 6000 model yields a maximum individual cancer risk of 0.07 in a million for residents and 0.02 per million for workers at the project site. The HRA also estimates non-cancer risk by calculating both chronic and acute hazard indices (HI) following the SCAQMD health risk assessment guidelines, which recommends a significance threshold of 1.0. The maximum chronic HI for the GE LM 6000 was estimated at 0.002 for both resident and worker receptors, well below the threshold of 1.0. Also indicated therein, the analysis estimates a maximum acute HI of 0.003 for resident receptors and 0.002 for worker receptors, which again are both below the significance threshold.

As shown in Table 4.B-17, the results of this analysis for the Rolls-Royce Trent 60 model yields a maximum individual cancer risk of 0.05 in a million for residents and 0.01 per million for workers at the project site. Both model results are well below the Rule 1401 Threshold of one cancer case in a million people as a significant cancer risk. The maximum chronic HI for the Rolls-Royce Trent 60 was estimated at 0.001 for both residents and worker receptors, well below the threshold of 1.0. Also indicated therein, the analysis estimates a maximum acute HI of 0.003 for resident receptors and 0.002 for worker receptors, which again are both below the significance threshold. Therefore, operation of the proposed project using the GE LM 6000 or Rolls-Royce Trent 60 turbines would result in less than significant impacts with respect to emissions of TACs.

Neither the project, as shown by modeling, nor any of the identified related projects (which are largely residential, restaurant, retail/commercial, and institutional developments), would represent a substantial source of long-term TAC emissions. However, the project and each of the related projects would likely generate minimal TAC emissions related to the use of consumer products, landscape maintenance activities, among other things. Pursuant to the law enacted in 1983 by California Assembly Bill 1807 (Tanner, Stats. 1983, ch. 1047), as amended, which directs the CARB to identify substances such as TAC and adopt ATCMs to control such substances, the SCAQMD has adopted numerous rules (primarily in Regulation XIV) that specifically address TAC emissions. These SCAQMD rules have resulted in and will continue to result in substantial Basin-wide TAC emissions reductions. As such, cumulative TAC emissions during long-term operations would be less than significant, and thus, would not contribute to a cumulative impact.

With respect to potential odor impacts, neither the proposed project, which would utilize BACT technology, nor any of the related projects (which are primarily institutional, general office, residential, retail, and restaurant uses) have a high potential to generate odor impacts. Furthermore, any related project that may have a potential to generate objectionable odors would be required by SCAQMD Rule 402 (Nuisance) to

implement BACT to limit potential objectionable odor impacts to a less than significant level. Thus, potential odor impacts from related projects are anticipated to be less than significant individually and cumulatively.

5. LEVEL OF SIGNIFICANCE AFTER MITIGATION

As discussed above, the proposed project would result in either no impacts or less than significant impacts without mitigation measures that are not required by applicable rules and regulations. Therefore, the project would still have a less than significant impact whether additional mitigation measures are employed or not.