3.2 AIR QUALITY

This section addresses the impacts of the proposed project on ambient air quality and the exposure of people, especially sensitive individuals, to unhealthful pollutant concentrations. Air pollutants of concern include ozone (O_3), carbon monoxide (CO), inhalable particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), and the two major contributors to the formation of O_3, reactive organic compounds (ROC), and oxides of nitrogen (NO_x). This section analyzes the type and quantity of emissions that would be generated by the construction and operation of the proposed project, and prescribes applicable mitigation measures to reduce emissions and impacts. This section is based on the air quality technical report prepared by Synectecology (2008). A copy of the report is included as Appendix B of this EIR.

3.2.1 ENVIRONMENTAL SETTING

REGIONAL CLIMATE

Air quality is affected by both the rate and location of pollutant emissions and by meteorological conditions that influence the movement and dispersal of pollutants. Atmospheric conditions such as wind speed, wind direction, and air temperature gradients, along with local topography, provide the link between air pollutant emissions and air quality.

The project site lies within the South Coast Air Basin (Basin). The distinctive climate of the Basin is determined by its terrain and geographical location. The Basin is a coastal plain with connecting broad valleys and low hills, bounded by the Pacific Ocean to the southwest and high mountains around its remaining perimeter. The general region lies in the semi-permanent high-pressure zone of the eastern Pacific, resulting in a mild climate tempered by cool sea breezes with light average wind speeds. The usually mild climatological pattern is interrupted occasionally by periods of extremely hot weather, winter storms, or Santa Ana winds.

Vertical dispersion of air pollutants in the Basin is hampered by the presence of persistent temperature inversions. High-pressure systems, such as the semi-permanent high-pressure zone in which the Basin is located, are characterized by an upper layer of dry air that warms as it descends, restricting the mobility in the formation of subsidence inversions. Such inversions restrict the vertical dispersion of air pollutants released into the marine layer and, together with strong sunlight, can produce worst-case conditions for the formation of photochemical smog.

The atmospheric pollution potential of an area is largely dependent on winds, atmospheric stability, solar radiation, and terrain. The combination of low wind speeds and low inversions produces the greatest concentration of air pollutants. On days without inversions, or on days of winds averaging over 15 miles per hour (mph), smog potential is greatly reduced (SCAQMD 2006).

EXISTING AIR QUALITY

"Air Pollution" is a general term that refers to one or more chemical substances that degrade the quality of the atmosphere. Individual air pollutants may adversely affect human or animal health and reduce visibility. Seven air pollutants have been identified by the U.S. Environmental Protection Agency (EPA) as being of concern nationwide: CO, O_3, nitrogen dioxide (NO_2), PM_{10}, $PM_{2.5}$, sulfur dioxide (SO_2), and lead (Pb). These pollutants are collectively referred to as criteria pollutants. The sources of these pollutants, their effects on human health and the nation's welfare, and their final deposition in the atmosphere vary considerably.

The South Coast Air Quality Management District (SCAQMD) maintains a network of air quality monitoring stations located throughout the Basin and has divided the Basin into air monitoring areas. The project site is located in the eastern portion of Source Receptor Area 8 (West San Gabriel Valley). This station does not monitor PM_{10}. These data are monitored at the East San Gabriel monitoring station located east of the project site. Table 3.2-1 summarizes the maximum and average pollutant levels and the exceedances of standards recorded at this station for the years 2002 through 2006.

Ozone (O_3) is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials. O_3 is a severe eye, nose, and throat irritant. O_3 also attacks synthetic rubber, textiles, plants, and other materials, and causes extensive damage to plants by leaf discoloration and cell damage.

O_3 is not emitted directly into the air, but is formed by a photochemical reaction in the atmosphere. O_3 precursors, which include ROC and NO_x, react in the atmosphere in the presence of sunlight to form O_3. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, O_3 is primarily a summer air pollution problem. The O_3 precursors, ROC and NO_x, are emitted by mobile sources and by stationary combustion equipment.

State and federal standards for O_3 have been set for an 8-hour averaging time, at 0.070 and 0.08 parts per million (ppm), respectively. The state 1-hour O_3 standard is 0.09 ppm, not to be exceeded. EPA set the 8-hour standard based on the scientific evidence that O_3 causes adverse health effects at lower O_3 concentrations over longer periods of time than the 1-hour standard addressed. EPA revoked a 1-hour standard in 2005.

Carbon monoxide (CO) is essentially inert to plants and materials but can have significant effects on human health. CO is a public health concern because it combines readily with hemoglobin, and thus, reduces the amount of oxygen transported in the bloodstream. Effects on humans range from slight headaches to nausea.

TABLE 3.2-1 AMBIENT AIR QUALITY AT THE WEST AND EAST SAN GABRIEL VALLEY MONITORING STATIONS

Pollutant	2003	2004	2005	2006	2006
Ozone (O_3)					
Maximum 1-hour concentration (ppm)	0.152	0.130	0.145	0.017	0.149
Maximum 8-hour concentration (ppm)	0.108	0.103	0.113	0.120	0.100
Number of Days Standard Exceeded					
CAAQS 1-hour (>0.09 ppm)	44	27	13	25	13
NAAQS 8-hour (>0.08 ppm)	28	9	5	7	6
Carbon Monoxide (CO)					
Maximum 1-hour concentration (ppm)	5	7	4	4	3
Maximum 8-hour concentration (ppm)	3.8	3.4	3.0	2.8	2.4
Number of Days Standard Exceeded					
NAAQS 8-hour (>9 ppm)	0	0	0	0	0
CAAQS 8-hour (>9.0 ppm)	0	0	0	0	0
Nitrogen Dioxide (NO_2)					
Maximum 1-hour concentration (ppm)	0.14	0.12	0.09	0.12	0.09
Number of Days Standard Exceeded					
CAAQS 24-hour (>0.25 ppm)	0	0	0	0	0
Inhalable Particulates (PM_{10})					
Maximum 24-hour concentration ($\mu g/m^3$)	119	83	76	81	83
Number of Days Standard Exceeded					
NAAQS 24-hour (>15 $\mu g/m^3$)	0	0	0	0	0
CAAQS 24-hour (>50 $\mu g/m^3$)	35.0	14.5	21.8	12.1	19.3
Inhalable Particulates ($PM_{2.5}$)					
Maximum 24-hour concentration ($\mu g/m^3$)	89.0	59.4	62.9	45.9	45.4
Number of Days Standard Exceeded					
CAAQS 24-hour (>65 $\mu g/m^3$)	0.9	0	0	0	0

Note:
CAAQS = California Ambient Air Quality Standards; NAAQS = National Ambient Air Quality Standards.
Source: ARB 2008; SCAQMD 2008

Motor vehicles are the dominant source of CO emissions in most areas. High CO levels develop primarily during winter when periods of light winds combine with the formation of ground level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Localized concentrations of CO may occur at points of severe traffic congestion. Motor vehicles also exhibit increased CO emission rates at low air temperatures.

State and federal CO standards have been set for both 1-hour and 8-hour averaging times. The state 1-hour standard is 20 ppm by volume, and the federal 1-hour standard is 35 ppm. Both state and federal standards are 9 ppm for the 8-hour averaging period.

Particulate matter can damage human health and retard plant growth. Health concerns associated with suspended particulate matter focus on those particles small enough to reach the lungs when inhaled. Particulates also reduce visibility and corrode materials.

There are federal and state ambient air quality standards for two classes of particulates: PM_{10} and $PM_{2.5}$. The state PM_{10} standards are 50 $\mu g/m^3$ (micrograms per cubic meter) as a 24-hour average, and 20 $\mu g/m^3$ as an annual arithmetic mean. The federal PM_{10} standard is 150 $\mu g/m^3$ as a 24-hour average. The EPA revoked an annual standard in 2006, citing a lack of evidence linking health effects to long term exposure to PM_{10}. The federal $PM_{2.5}$ standards are 15 $\mu g/m^3$ for the annual average, and 35 $\mu g/m^3$ for the 24-hour average. The California annual $PM_{2.5}$ standard is 12 $\mu g/m^3$, as an annual arithmetic mean.

Nitrogen dioxide (NO_2) is formed in the atmosphere primarily by the rapid reaction of the colorless gas nitric oxide (NO) with atmospheric oxygen. It is a reddish brown gas with an odor similar to that of a bleach. NO_2 participates in the photochemical reactions that result in ozone. The greatest source of NO, and subsequently NO_2, is the high temperature combustion of fossil fuels such as in motor vehicle engines and power plant boilers. NO_2 and NO are referred to collectively as NO_x. Health effects of NO_x include irritation or damage to the lungs, bronchitis, pneumonia, and lower resistance to respiratory infections such as influenza. The California Air Resources Board (ARB) approved a reduced hourly NO_2 standard (0.18 ppm) and a new annual standard (0.030 ppm) in 2007, to be effective upon formal adoption of the administrative code. The current federal standard is 0.053 ppm, as an annual arithmetic mean.

Sulfur dioxide (SO_2) is a colorless gas with a sharp irritating odor. It can react in the atmosphere to produce sulfuric acid and sulfates, which contribute to acid deposition and atmospheric visibility reduction. It also contributes to the formation of PM_{10}. Most SO_2 emitted into the atmosphere is from burning sulfur containing fossil fuels by mobile sources such as marine vessels and farm equipment, and stationary fuel combustion. Health effects of SO_2 include irritation to the mucous membranes of the eyes and noise, and it may also affect the mouth, trachea, and lungs. Healthy people may experience sore throats, coughing, and breathing difficulties when exposed to high concentrations. SO_2 causes constriction of the airways and poses a health hazard to asthmatics who are very sensitive to SO_2.

Lead (Pb) is a bluish-gray metal that occurs naturally in small quantities. Pb also occurs in a variety of compounds such as lead acetate, lead chloride, lead chromate, lead nitrate, and lead oxide. Pure Pb is

insoluble in water. However, some lead compounds are water soluble. Pb and lead compounds in the atmosphere often come from fuel combustion sources, such as burning of solid waste, coal, and oils. Historically, the largest source of Pb in the atmosphere resulted from the combustion of leaded gasoline in motor vehicles. However, with the phase out of leaded gasoline, concentrations in the air have substantially decreased. Industrial sources of atmospheric Pb include steel and iron factories, lead smelting and refining, and battery manufacturing. Atmospheric Pb may also result from lead in entrained dust and dirt contaminated with Pb. Lead-based paints were commonly used in the past and Pb paint chips or dust can be inhaled or ingested.

Toxic air contaminants (TACs) are pollutants that may be expected to result in an increase in mortality or serious illness, or that may pose a present or potential hazard to human health. Health effects of TACs include cancer, birth defects, neurological damage, damage to the body's natural defense system, and diseases that lead to death. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations. In general, for those TACs that may cause cancer, there is no concentration that does not present some risk. In other words, there is no threshold level below which adverse health impacts may not be expected to occur. This contrasts with the criteria air pollutants for which acceptable levels of exposure can be determined and for which the ambient standards have been established. Most TACs originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., construction equipment and airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries).

Greenhouse Gases are gases that trap heat in the atmosphere. The major concern is that increases in greenhouse gases are causing global climate change. Global climate change is a change in the average weather on earth that can be measured by wind patterns, storms, precipitation, and temperature. Although there is tremendous disagreement as to the speed of global warming and the extent of the impacts attributable to human activities, most agree that there is a direct link between increased emission of so-called greenhouse gases and long term global temperature. What greenhouse gases have in common is that they allow sunlight to enter the atmosphere, but trap a portion of the outward-bound infrared radiation and warm up the air.

The process is similar to the effect greenhouses have in raising the internal temperature, hence the name greenhouse gases. Both natural processes and human activities emit greenhouse gases. The accumulation of greenhouse gases in the atmosphere regulates the earth's temperature; however, emissions from human activities such as electricity production and motor vehicles have elevated the concentration of greenhouse gases in the atmosphere. This accumulation of greenhouse gases has contributed to an increase in the temperature of the earth's atmosphere and contributed to global climate change. The principal greenhouse gases are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), and water vapor (H_2O). Carbon dioxide is the reference gas for climate change because it gets the most attention and is considered the most important greenhouse gas. To account for the warming potential of greenhouse gases, greenhouse gas emissions are often quantified and reported as carbon dioxide-equivalent (CO_2e). Large emissions

sources are reported in million metric tons of CO_2e ($MMTCO_2e$). HFCs are used in refrigeration systems as substitutes for chlorofluorocarbons (CFCs), which were banned for destroying the ozone layer.

Sensitive Air Quality Receptors

Some population groups are considered more sensitive to air pollution than others due to the types of users or activities involved. Sensitive receptors for air quality include children, the elderly, and the acutely and chronically ill, especially those with cardio-respiratory diseases. Residential areas are also considered to be sensitive to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present. Recreational land uses are considered moderately sensitive to air pollution. Although exposure periods are generally short, exercise places a high demand on respiratory functions, which can be impaired by air pollution. In addition, noticeable air pollution can detract from the enjoyment of recreation. Industrial and commercial areas are considered the least sensitive to air pollution. Exposure periods are relatively short and intermittent, as the majority of the workers tend to stay indoors most of the time. Sensitive air quality receptors in the vicinity of the project site include residential uses to the east, south, west, and north, as well as on-site senior living, assisted living, and psychiatric hospital uses.

3.2.2 Regulatory Setting

Federal Clean Air Act

The federal Clean Air Act (42 U.S.C. Sections 7401-7671q) was first enacted in 1955 and has been amended numerous times, most recently in 1990. The CAA established federal air quality standards, known as the National Ambient Air Quality Standards, for SO_2, CO, NO_2, O_3, PM_{10}, and Pb and specified future dates for achieving compliance with these standards. The National Ambient Air Quality Standards were amended in July 1997 to include an additional standard for O_3 and to adopt a National Ambient Air Quality Standards for $PM_{2.5}$. The Clean Air Act also mandates that each state submit and implement a State Implementation Plan for local areas not meeting the National Ambient Air Quality Standards. State Implementation Programs must include pollution control measures that demonstrate how the NAAQS will be met.

California Clean Air Act

The California Clean Air Act, signed into law in 1988, requires all areas of the state to achieve and maintain the California Ambient Air Quality Standards by the earliest practical date. Standards for most of the criteria and other pollutants have been set by the State of California. The California Ambient Air Quality Standards tend to be more restrictive than the National Ambient Air Quality Standards and are based on even greater health and welfare concerns. California has also set California Ambient Air Quality Standards for sulfates, hydrogen sulfide, vinyl chloride and visibility-reducing particles. Table 3.2-2 shows the National Ambient Air Quality Standards and California Ambient Air Quality Standards currently in effect for criteria pollutants.

TABLE 3.2-2 NATIONAL AND CALIFORNIA AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	Federal[1]		State[2]
		Primary[3]	Secondary[4]	Concentration[5]
Ozone (O_3)[6]	1-Hour	-	Same as Primary Standard	0.09 ppm (180 µg/m^3)
	8-Hour	0.08 ppm (157 µg/m^3)		0.070 ppm (137 µg/m^3)[9]
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m^3)	None	9.0 ppm (10 mg/m^3)
	1-Hour	35 ppm (40 mg/m^3)		20 ppm (23 mg/m^3)
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.053 ppm (100 µg/m^3)	Same as Primary Standard	0.030 ppm (56 µg/m^3)[10]
	1-Hour	-		0.018 ppm (338µg/m^3)[10]
Sulfur Dioxide (SO_2)	Annual Average	0.03 ppm (80 µg/m^3)	-	-
	24-Hour	0.14 ppm (365 µg/m^3)	-	0.04 ppm (105 µg/m^3)
	3-Hour	-	0.5 ppm (1300 µg/m^3)	-
	1-Hour	-	-	0.25 ppm (655 µg/m^3)
Suspended Particulate Matter (PM_{10})[7]	24-Hour	150 µg/m^3	Same as Primary Standard	50 µg/m^3
	Annual Arithmetic Mean	Revoked		20 µg/m^3
Fine Particulate Matter ($PM_{2.5}$)[8]	24-Hour	35 µg/m^3	Same as Primary Standard	-
	Annual Arithmetic Mean	15 µg/m^3		12 µg/m^3
Lead (Pb)	30-Day Average	-	-	1.5 µg/m^3
	Calendar Quarter	1.5 µg/m^3	Same as Primary Standard	-
Hydrogen Sulfide (H_2S)	1-Hour	No Federal Standards		0.03 ppm (42 µg/m^3)
Sulfates (SO_4)	24-Hour			25 µg/m^3
Visibility Reducing Particles	8-Hour (10 am to 6 pm, Pacific Standard Time)			In sufficient amount to produce an extinction coefficient of 0.23 per km due to particles when the relative humidity is less than 70 percent.
Vinyl chloride[9]	24 Hour			0.01 ppm (26 µg/m^3)

[1] NAAQS (other than O_3, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when 99 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the USEPA for further clarification and current federal policies.

[2] California Ambient Air Quality Standards for O_3, CO (except Lake Tahoe), SO_2 (1- and 24-hour), NO_2, PM_{10}, $PM_{2.5}$ and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded.

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

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

[5] Concentration expressed first in units in which it was promulgated. Ppm in this table refers to ppm by volume or micromoles of pollutant per mole of gas.

[6] On June 15, 2005 the 1-hour ozone standard was revoked for all areas except the 8-hour ozone nonattainment Early Action Compact Areas (those areas do not yet have an effective date for their 8-hour designations). Additional information on federal ozone standards is available at http://www.epa.gov/oar/oaqps/greenbk/index.html.

[7] Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, the USEPA revoked the annual PM_{10} standard on December 17, 2006.

[8] Effective, December 17, 2006, the USEPA lowered the $PM_{2.5}$ 24-hour standard from 65 µg/m^3 to 35 µg/m^3.

[9] 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.

[10] The Nitrogen Dioxide ambient air quality standard was amended on February 22, 2007, to lower the 1-hr standard to 0.18 ppm and establish a new annual standard of 0.030 ppm. These changes become effective after regulatory changes are submitted and approved by the Office of Administrative Law, expected later this year.

ppm = parts per million; µg/m^3 = micrograms per cubic meter; mg/m^3 = milligrams per cubic meter
Source: EPA 2008; ARB,2007c.

Specific geographic areas are classified as either "attainment" or "non-attainment" areas for each pollutant based on the comparison of measured data with federal and state standards. If an area is redesignated from non-attainment to attainment, the Clean Air Act requires a revision to the State Implementation Plan, called a maintenance plan, to demonstrate how the air quality standard will be maintained for at least 10 years. The attainment status for the Basin is shown in Table 3.2-3. The Basin is a federal and state nonattainment area for O_3, PM_{10}, and $PM_{2.5}$.

TABLE 3.2-3 ATTAINMENT FOR THE SOUTH COAST AIR BASIN

Pollutant	Attainment Status	
	Federal	**State**
O_3 (1[a]- and 8-hour)	Severe-17 nonattainment	Nonattainment
PM_{10}	Nonattainment Serious	Nonattainment
$PM_{2.5}$	Nonattainment	Nonattainment
CO	Attainment/Maintenance	Attainment
NO_2	Attainment	Attainment
SO_2	Attainment	Attainment
Pb	Attainment	Attainment

[a] Federal 1-hour O_3 repealed by law with implementation of the 8-hour standard.
Sources: EPA, *The Green Book Nonattainment Areas for Criteria Pollutants*, website http://www.epa.gov/air/oaqps/greenbk/, accessed February 5, 2008; ARB, Area Designations, 2007d, website http://www.arb.ca.gov/desig/adm/adm.htm, accessed February 4, 2008.

REGIONAL AUTHORITY

The SCAQMD has jurisdiction over an area of approximately 10,743 square miles. This area includes all of Los Angeles County except for the Antelope Valley, all of Orange County, the non-desert portion of western San Bernardino County, and the western and Coachella Valley portions of Riverside County. The Basin is a subregion of the SCAQMD jurisdiction.

The SCAQMD and the Southern California Association of Governments (SCAG) are responsible for preparing the Air Quality Management Plan (AQMP), which address federal and state Clean Air Act requirements. The AQMP details goals, policies, and programs for improving air quality.

The SCAQMD adopted a comprehensive AQMP update, the 2003 AQMP for the Basin, on August 1, 2003 (SCAQMD 2007a). The 2003 AQMP outlines the air pollution control measures needed to meet federal health-based standards for O_3 (one-hour standard) by 2010, and for PM_{10} by 2006. It also demonstrates how the federal standard for CO, achieved for the first time at the end of 2002, will be maintained.[1] This revision to the AQMP also addresses several state and federal planning requirements and incorporates significant new scientific data, primarily in the form of updated emissions inventories, ambient measurements, new meteorological episodes, and new air quality modeling tools. The 2003 AQMP is consistent with and builds upon the approaches taken in the 1997 AQMP and the 1999 Amendments to the O_3 State Implementation Plan for the Basin for the attainment of the federal O_3 air

[1] The Basin has technically met the CO standards since 2002, but the official attainment status has not been reclassified by the EPA.

quality standard.[2] Lastly, the AQMP takes a preliminary look at what will be needed to achieve new and more stringent health standards for O_3 and $PM_{2.5}$.

As a result of state and local control strategies, the Basin has not exceeded the federal CO standard since 2002. In March 2005, the SCAQMD adopted a CO Redesignation Request and Maintenance Plan that provides for maintenance of the federal CO air quality standard until at least 2015 and commits to revising the Redesignation Request and Maintenance Plan in 2013 to ensure maintenance through 2025 (SCAQMD 2005a). The SCAQMD also adopted a CO emissions budget that covers the years 2005 through 2015. The EPA approved the Redesignation Request and Maintenance Plan, and the Basin was redesignated as a CO attainment area effective June 11, 2007 (Federal Register 2007).

The purpose of the 2007 AQMP for the Basin is to set forth a comprehensive program that will lead the region into compliance with federal 8-hour ozone and $PM_{2.5}$ air quality standards. The Final 2007 AQMP was adopted by the AQMD Governing Board on June 1, 2007. On June 22, 2007, ARB held a public hearing and members of the public, elected officials, as well as AQMD Board Members and staff recommended more aggressive actions to reduce emissions from mobile sources. Mobile sources contribute over 80 percent of the particulate matter pollution in the region and are responsible for impacting public health. Based on public input received at the hearing, ARB delayed the adoption of its State Strategy. Instead, the ARB Board directed its staff to work closely with the AQMD to strengthen the plan to further reduce mobile source emissions (SCAQMD 2007b). The Plan was revised, approved by ARB on September 27, 2007, and submitted to EPA for approval on November 28, 2007 (ARB 2007a, ARB 2007b). The 2007 AQMP also incorporates significant new scientific data, primarily in the form of updated emissions inventories, ambient measurements, new meteorological episodes, and new air quality modeling tools.

GREENHOUSE GAS EMISSIONS

In 2005, in recognition of California's vulnerability to the effects of climate change, Governor Schwarzenegger established Executive Order S-3-05, which sets forth a series of target dates by which statewide emissions of greenhouse gases would be progressively reduced, as follows:

- By 2010, reduce greenhouse gas emissions to 2000 levels;
- By 2020, reduce greenhouse gas emissions to 1990 levels; and
- By 2050, reduce greenhouse gas emissions to 80 percent below 1990 levels.

In 2006, California passed the California Global Warming Solutions Act of 2006 (Assembly Bill 32, California Health and Safety Code Division 25.5, Sections 38500 et seq.), which requires ARB to design and implement emissions limits, regulations, and other measures, such that feasible and cost-effective

[2] Until the 2003 AQMP is officially approved by the EPA, the 1997 AQMP and the 1999 Amendments to the Ozone State Implementation Plan will remain in effect.

statewide greenhouse gas emissions are reduced to 1990 levels by 2020 (representing an approximate 25 percent reduction in emissions).

In June 2007, ARB directed staff to pursue 37 early actions for reducing greenhouse gas emissions under the California Global Warming Solutions Act of 2006. The broad spectrum of strategies to be developed – including a Low Carbon Fuel Standards, regulations for refrigerants with high global warming potentials, guidance and protocols for local governments to facilitate greenhouse gas reductions, and green ports – reflects that the serious threat of climate change requires action as soon as possible (ARB 2007e).

In addition to approving the greenhouse gas reduction strategies, ARB directed staff to further evaluate early action recommendations made at the June 2007 meeting, and to report back to ARB within six months. The general sentiment of ARB suggested a desire to try to pursue greater greenhouse gas emissions reductions in California in the near term. Since the June 2007 ARB hearing, ARB staff has evaluated all 48 recommendations submitted by several stakeholder and several internally-generated staff ideas and published the *Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California*, recommended for ARB board consideration in October 2007 (ARB 2007f). Based on its additional analysis, ARB staff is recommending the expansion of the early action list to a total of 44 measures (see Table 3.2-4). Nine of the strategies meet the Assembly Bill 32 definition of discrete early action measures. Discrete early action measures are measures that will be in place and enforceable by January 1, 2010. The discrete early action items include: (1) a Low Carbon Fuel standards for ethanol, biodiesel, hydrogen, electricity, compressed natural gas, liquefied petroleum gas and biogas; (2) restrictions on high Global Warming Potential refrigerants; (3) landfill methane capture; (4) Smartway truck efficiency; (5) port electrification; (6) reduction of perfluorocarbons from the semiconductor industry; (7) reduction of propellants in consumer products; (8) tire inflation; and (9) sulfur hexafluoride (SF_6) reductions from the non-electricity sector. Table 3.2-4 lists all 44 of the early action measures.

TABLE 3.2-4 RECOMMENDED GREENHOUSE GAS MEASURES TO BE INITIATED BY ARB BETWEEN 2007 AND 2012

ID#	Sector	Strategy Name
1	Fuels	Above Ground Storage Tanks
2	Transportation	Diesel – Offroad equipment (non-agricultural)
3	Forestry	Forestry protocol endorsement
4	Transportation	Diesel – Port trucks
5	Transportation	Diesel – Vessel main engine fuel specifications
6	Transportation	Diesel – Commercial harbor craft
7	Transportation	Green ports
8	Agriculture	Manure management (methane digester protocol)
9	Education	Local government greenhouse gas (GHG) reduction guidance/protocols
10	Education	Business GHG reduction guidance/protocols
11	Energy Efficiency	Cool communities program
12	Commercial	Reduce high Global Warming Potential (GWP) GHGs in products

ID#	Sector	Strategy Name
13	Commercial	Reduction of PFCs from semiconductor industry
14	Transportation	Smartway truck efficiency
15	Transportation	Low Carbon Fuel Standard (LCFS)
16	Transportation	Reduction of HFC-134a from DIY Motor Vehicle AC servicing
17	Waste	Improved landfill gas capture
18	Fuels	Gasoline disperser hose replacement
19	Fuels	Portable outboard marine tanks
20	Transportation	Standards for off-cycle driving conditions
21	Transportation	Diesel – Privately-owned on-road trucks
22	Transportation	Anti-idling enforcement
23	Commercial	SF_6 reductions from the non-electric sector
24	Transportation	Tire inflation program
25	Transportation	Cool automobile paints
26	Cement	Cement (A): Blended cements
27	Cement	Cement (B): Energy efficiency of California cement facilities
28	Transportation	Ban on HFC release from Motor Vehicle AC service/dismantling
29	Transportation	Diesel – offroad equipment (agricultural)
30	Transportation	Add AC leak tightness test and repair to Smog Check
31	Agriculture	Research on GHG reductions from nitrogen land applications
32	Commercial	Specifications for commercial refrigeration
33	Oil and Gas	Reduction in venting/leaks from oil and gas systems
34	Transportation	Requirement of low GWP GHGs for new motor vehicle ACs
35	Transportation	Hybridization of medium and heavy-duty diesel vehicles
36	Electricity	Reduction of SF_6 in electricity generation
37	Commercial	High GWP refrigerant tracking, reporting, and recovery program
38	Commercial	Foam recovery/destruction program
39	Fire Suppression	Alternative suppressants in fire protection systems
40	Transportation	Strengthen light-duty vehicle standards
41	Transportation	Truck stop electrification with incentives for truckers
42	Transportation	Diesel – Vessel speed reductions
43	Transportation	Transportation refrigeration – electricity standby
44	Agriculture	Electrification of stationary agricultural engines
Source: ARB 2007f.		

The ARB Board adopted Resolution 07-55 in December 2007, approving 427 $MMTCO_2e$ as the statewide greenhouse gas emissions limit for 2020, which is equivalent to the 1990 emissions level. The 2020 target reductions are currently estimated to be 174 $MMTCO_2e$. In total, the recommended early actions (see Table 3.2-4 above) have the potential to reduce greenhouse gas emissions by at least 42 $MMTCO_2e$ by 2020, representing about 25 percent of the estimated reductions needed by 2020. The measures are in the sectors of fuels, transportation, forestry, agriculture, education, energy efficiency, commercial, solid waste, cement, oil and gas, electricity, and fire suppression.

Further complexity has been recently injected into the field of greenhouse gas analysis by the passage of Senate Bill 375 (2008) which in sum would require an as-yet undefined role in the local process by SCAG (the "metropolitan planning organization" to which the City belongs). While ARB has recently

released a Draft Scoping Plan (June 2008) to guide compliance with Assembly Bill 32, the recommendations therein are still preliminary. The City of Pasadena had already implemented many of the recommendations prior to the release of the Draft Scoping Plan, through avenues such as its Green Building Ordinance, its transit-oriented development zones and standards, its approaches to public transportation, and the like. Most importantly, the City is also in the process of drafting a local carbon inventory, which will shortly lead to a local Greenhouse Gas Reduction Plan and related updates to the City's General Plan elements. The City intends to work with ARB and the State Attorney General's Office to ensure that its Greenhouse Gas Reduction Plan and updated General Plan elements meet the goals and objectives of the state.

3.2.3 ENVIRONMENTAL IMPACTS

METHODOLOGY

For this project, emissions of ROC, NO_x, CO, PM_{10}, $PM_{2.5}$, and CO_2 were calculated using the URBEMIS2007 software package, version 9.2.2 (Rimpo and Associates 2007). The emissions factors and calculation methodologies contained in the URBEMIS2007 program have been approved for use by SCAQMD. URBEMIS is a calculation tool designed to estimate air emissions from land use development projects based on development type and size. The model contains data that are specific for the SCAQMD and Los Angeles County. Inputs include each land use type and size, in terms of building area, number of dwelling units, etc., and the vehicle trip generation for each land use. Appendix B contains the worksheets documenting the input and output for this analysis.

Trip generation data were provided by Linscott, Law & Greenspan Engineers as part of the traffic study for this project (see Appendix F). The proposed project would add 1,467 average daily vehicle trips. Because earlier years result in higher emissions, a worst-case scenario, the operation of all phases of the proposed project was assumed to begin in 2009, although the proposed project would be phased in with the first phase operational in 2010 and subsequent phases occurring beyond that time.

The SCAQMD has promulgated methodology and standards for assessment of local exposure to NO_2, CO, PM_{10}, and $PM_{2.5}$. This methodology is called Localized Significance Thresholds (LST) (SCAQMD 2003). An LST analysis is a localized air dispersion modeling analysis used to predict maximum concentration levels of these criteria pollutant emissions generated from a project site that could reach nearby sensitive receptors. Air dispersion modeling is a function of multiple variables, including local-specific meteorological conditions, site-specific air pollutant emission levels, and sensitive receptor distances to the modeling site. In order to minimize efforts for detailed dispersion modeling, SCAQMD developed screening (lookup) tables to assist lead agencies with a simple tool for evaluating impacts from small typical projects. The use of LST lookup tables are specific for various areas within the Basin and are designed for projects up to 5 acres in size.

Localized CO emissions may occur off-site under conditions of severe congestion at major intersections. The Transportation Project-Level Carbon Monoxide Protocol, UCD-ITS-97-21, University of California,

Davis, December 1997, provides procedures and guidelines for use by agencies to evaluate the potential local level CO impacts of a transportation project. The procedures may also be applied to a development project. The Transportation Project-Level Carbon Monoxide Protocol provides a methodology for determining the level of analysis, if any, required on a project. According to the Transportation Project-Level Carbon Monoxide Protocol, projects may worsen air quality if they significantly increase the percentage of vehicles in cold start modes (i.e., the starting of a vehicle after at least 1-hour of non-operation), defined as an increase in the number of vehicles operating in a cold start mode of 2 percent or more; those that significantly increase traffic volumes, defined as an increase of 5 percent over existing volumes; and those that worsen traffic flow, defined for intersections, as increasing average delay at signalized intersections operating at level of service E or F. A project may contribute to a CO hot spot where it increases volume and cold starts. The increased volume and cold start criteria are of concern where projects have concentrated traffic generation, such as at large residential developments or office buildings. A residential development would increase cold starts at nearby intersections in the morning peak hour.

THRESHOLDS OF SIGNIFICANCE

As part of the Initial Study (see Appendix A), it was determined that the proposed project would not conflict with or obstruct implementation of the applicable air quality management plan or create objectionable odors. Accordingly, these issues are not further analyzed in the EIR.

The proposed project has the potential to generate short-term air quality impacts during construction and long-term air quality impacts during operation. The proposed project would have a significant effect on air quality if it would:

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

- 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); or

- Expose sensitive receptors to substantial pollutant concentrations.

At this time, there are no statewide guidelines for greenhouse gas emission impacts, but this will be addressed through the provisions of Senate Bill 97, which was enacted in 2007. Senate Bill 97 (2007 Statutes Chapter 185) acknowledges that local agencies must analyze the environmental impact of greenhouse gases under CEQA. Furthermore, Senate Bill 97 requires the Governor's Office of Planning and Research (OPR) to develop CEQA guidelines for the effects and mitigation of greenhouse gas emission. Unfortunately, these guidelines will not be available for some time as OPR has until July 1, 2009 to draft the new greenhouse gas guidelines, and the State Resources Agency will thereafter have until January 1, 2010 to certify and adopt the regulations. In the interim, local agencies must analyze the

impact of greenhouse gases. For the purpose of this EIR, the lead agency has analyzed whether the project would conflict with the goal of reducing greenhouse gas emission in California to 1990 levels by 2020, as set forth in the timetable established in the California Global Warming Solutions Act of 2006.

The City of Pasadena has not developed specific air quality thresholds for air quality impacts. Because of the SCAQMD's regulatory role in the Basin, the significance thresholds and analysis methodologies in the SCAQMD's *Air Quality Guidance Handbook* are used in evaluating project impacts (SCAQMD 2006). Specifically, the proposed project would result in a significant construction or operational air quality impact if any of the following occur:

- Regional emissions exceed the mass daily thresholds set forth in Table 3.2-5.

TABLE 3.2-5 SCAQMD AIR QUALITY SIGNIFICANCE THRESHOLDS

MASS DAILY THRESHOLDS [a]		
POLLUTANT	**CONSTRUCTION [b]**	**OPERATION [c]**
NO_X	100 lbs/day	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM_{10}	150 lbs/day	150 lbs/day
$PM_{2.5}$	55 lbs/day	55 lbs/day
SO_X	150 lbs/day	150 lbs/day
CO	550 lbs/day	550 lbs/day
Lead	3 lbs/day	3 lbs/day
TOXIC AIR CONTAMINANTS (TACS) AND ODOR THRESHOLDS		
TACs (including carcinogens and noncarcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Hazard Index ≥ 1.0 (project increment)	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402	
Ambient Air Quality for Criteria Pollutants [d]		
NO_2 1-hour average annual average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 0.25 ppm (state) 0.053 ppm (federal)	
PM_{10} 24-hour average annual geometric average annual arithmetic mean	10.4 µg/m^3 (construction)[e] & 2.5 µg/m^3 (operation) 1.0 µg/m^3 20 µg/m^3	
$PM_{2.5}$ 24-hour average	10.4 µg/m^3 (construction)[e] & 2.5 µg/m^3 (operation)	
Sulfate 24-hour average	25 µg/m^3	
CO 1-hour average 8-hour average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 20 ppm (state) 9.0 ppm (state/federal)	

[a] Source: SCAQMD 2007c.
[b] Construction thresholds apply to both the South Coast Air Basin and Coachella Valley (Salton Sea and Mojave Desert Air Basins).
[c] Ambient air quality thresholds for criteria pollutants based on SCAQMD Rule 1303, Table A-2 unless otherwise stated.
[d] Ambient air quality threshold based on SCAQMD Rule 403.

- Either of the following conditions would occur at an intersection or roadway within one-quarter mile of a sensitive receptor:
    - The proposed project causes an exceedance of the California 1-hour or 8-hour CO standards of 20 or 9.0 ppm, respectively; or
    - For intersection or roadways where existing CO levels exceed California standards, the incremental increase due to the project is equal to or greater than 1.0 ppm for the 1-hour CO standard, or 0.45 ppm for the 8-hour CO standard.
- Exposure of sensitive receptors to TACs would exceed the thresholds stated in Table 3.2-4.

IMPACT ANALYSIS

AIR-1: *During the construction phase, VOC emissions would exceed the SCAQMD significance threshold, and therefore, the proposed project would violate an air quality standard. During the operational phase, regional pollutant emissions would not exceed the SCAQMD significance thresholds and would not violate an air quality standard.*

CONSTRUCTION

The primary source of air pollutants during construction would be the engine exhaust from construction equipment and on-road haul trucks and dust from demolition, grading, and earthmoving operations. The operation of construction equipment and vehicles would result in emissions of ROC, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$. Emission estimates were calculated for the proposed project using the URBEMIS2007 model described above.

For the purposes of this analysis, it is assumed that the proposed project would be developed in 5 phases (see Table 3.2-6). All demolition is assumed to occur at the onset of the first phase of construction for the purposes of overstating the demolition impacts. It is also assumed that 47,000 square feet of subterranean parking and utility closets would be constructed in Phase 2 beneath the proposed Independent Living Building (Building 33). This analysis assumes that the 80,000-square-foot subterranean parking structure would also be constructed in Phase 2 to accommodate the new psychiatric hospital. As such, for the purposes of the overall disturbed area involved in the grading effort, twice the area of the structure was used to overestimate potential impacts from excavation in Phase 2. In both cases, the parking structures are assumed to be excavated and the cut material hauled off-site by heavy trucks. Both cases overestimate the actual required grading.

TABLE 3.2-6 AREAS USED IN THE CALCULATION OF CONSTRUCTION EMISSIONS BY PHASE

Phase	Square Footage
Phase 1	
Demolition	3,320
Construction	10,560
Phase 2	
Demolition	28,648
Construction	179,750
Subterranean Parking Construction	127,000
Phase 3	
Demolition	6,844
Construction	51,200
Phase 4	
Demolition	8,800
Construction	34,400
Phase 5	
Demolition	0
Construction	77,500
Source: Synectecology 2008.	

The URBEMIS2007 model assumes that the area to be disturbed for construction is twice the square footage of the structure. Assisted care residential units are assumed to disturb 2,722.5 square feet per unit. Not including the subterranean parking to be constructed south of the new psychiatric hospital, about 828,706 square feet, or 19 acres, would be disturbed during the four phases of construction when combined.

Demolition activities would encompass 47,492 square feet of enclosed space. While demolition activities are subject to dust control under SCAQMD Rule 403, the URBEMIS2007 model does not allow for demolition dust suppression. As such, the values from PM_{10} and $PM_{2.5}$ attributed to demolition dust were reduced by 45 percent, representing a 55 percent control efficiency as projected by the model for standard dust suppression for grading activities. It is mandatory for all construction projects in the Basin to comply with SCAQMD Rule 403 for fugitive dust (SCAQMD 2005b). Specifically, Rule 403 requires the use of the applicable best available control measures to minimize fugitive dust. These measures may include, but are not limited to, applying water in sufficient quantities to prevent the generation of visible dust plumes, applying soil binders to uncovered areas, re-establishing ground cover as quickly as possible, utilizing a wheel washing system to remove bulk material from tires and vehicle undercarriages before vehicles exit the project site, and maintaining effective cover over exposed areas.

Table 3.2-7 shows the results for the time periods when daily pollutant emissions would be at a maximum. Emissions for other time periods are included in Appendix B. The calculations for the project construction-related air emissions include watering active grading areas at least two times per day in compliance with Rule 403.

TABLE 3.2-7 CONSTRUCTION EMISSIONS

Phase of Construction	VOC	NOx	CO	SOx	PM10	PM2.5
	Emissions - Pounds per day					
Phase 1	23	27	14	0	2	1
Phase 2	183	43	46	<1	9	3
Phase 3	52	40	20	<1	3	2
Phase 4	74	73	33	<1	4	3
Phase 5	79	33	17	<1	4	2
Maximum daily construction emissions	**183**	73	46	<1	9	3
SCAQMD Significance Screening Thresholds- from Table 3.2-4	*75*	*100*	*550*	*150*	*150*	*55*
Exceed threshold?	**Yes**	No	No	No	No	No
Emissions rounded to the nearest pound; totals may not add due to rounding. Source: Synectecology 2008.						

As shown in Table 3.2-7, VOC emissions during Phases 2 and 5 are estimated at 183 and 79 pounds per day respectively, which exceeds the 75 pounds per day SCAQMD threshold. Emissions of all other analyzed pollutants would not exceed the SCAQMD daily emissions thresholds. The principal source of the VOC emissions is the application of paints and coatings. The construction impact would be significant. Implementation of mitigation measure AIR-A would be required to reduce VOC emissions below the SCAQMD daily emissions thresholds and reduce the level of impact to less than significant.

OPERATIONS

Operational emissions come from area sources and mobile sources. Area sources include natural gas for space heating and water heating, gasoline-powered landscaping and maintenance equipment, consumer products such as household cleaners, and architectural coatings for routine maintenance. Mobile sources are vehicle trips that would be made by residents, employees, and visitors to the project site. The major source of long-term air quality impacts is emission produced from project-generated vehicle trips. Stationary sources add only minimally to these values.

At completion, the proposed project is estimated to add 1,467 net new daily trips. Estimated trip generation numbers for the proposed project are provided in the project traffic study (see Appendix F). Emissions generated from project-related trips are based on the URBEMIS2007 model and per the model default, assume occupancy in 2009 for a more conservative analysis. In actuality, none of the project phases would be complete by 2009; but as emissions per vehicle go down each year due to emission restrictions and the ongoing replacement of older vehicles, the use of 2009 emissions factors presents a worst-case analysis. Further, while the project would remove 47,612 square feet of existing uses, no credit was taken for the associated reduction in stationary source emissions, although the reduction in average daily trips shown in the traffic study was used in the analysis. Both summer and winter scenarios were modeled and the higher of the 2 values are included in Table 3.2-8.

In addition to vehicle trips, the proposed project would produce emissions from on-site sources. The combustion of natural gas for heating the structures and water would occur. Landscaping would be maintained, requiring the use of gardening equipment and their attendant emissions. Additionally, the structures would require repainting over time resulting in the release of VOC emissions. Finally, the use of consumer aerosol products is associated with the residential component of the proposed project. The total operational emissions are shown in Table 3.2-8. The URBEMIS input-output data sheets are in Appendix B.

TABLE 3.2-8 DAILY OPERATIONS EMISSIONS

Sources - 2011	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
	Emissions – Pounds per Day					
Mobile sources	14	21	154	<1	24	5
Natural gas	<1	2	1	0	0	0
Landscape maintenance	<1	<1	5	0	<1	<1
Structural maintenance	1	N/A	N/A	N/A	N/A	N/A
Consumer products	7	N/A	N/A	N/A	N/A	N/A
Total Operations Emissions	23	24	160	<1	24	5
SCAQMD Significance Screening Thresholds- from Table 3.2-4	*55*	*55*	*550*	*150*	*150*	*55*
Exceed threshold?	No	No	No	No	No	No

Emissions rounded to the nearest pound; totals may not add due to rounding.
Values shown are highest for summer or winter operation.
Source: Synectecology 2008.

As shown in Table 3.2-8, emissions of all analyzed pollutants would be less than the SCAQMD daily emissions thresholds. Accordingly, the operations impact on regional air quality would be less than significant.

AIR-2: *The proposed project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment during construction or operation.*

In accordance with SCAQMD methodology, any project that does not exceed or can be mitigated to a less than the daily threshold values does not contribute to a cumulatively considerable impact. With implementation of mitigation measure AIR-A, the project's contribution of VOC emissions during construction would be reduced to a less than significant level. Operation of the proposed project would not exceed the SCAQMD daily emissions thresholds. Therefore, it would not contribute to a cumulatively considerable air quality impact.

Construction and operation of the proposed project would contribute greenhouse gas emissions that are the source of global climate change. This issue is discussed in detail in Section 4.3, Cumulative Impacts of this EIR.

AIR-3: *The proposed project would not expose sensitive receptors to substantial pollutant concentrations from on-site emissions of criteria pollutants, off-site emissions of CO, or TACs.*

SHORT-TERM LOCALIZED IMPACTS

As described in the methodology section above, SCAQMD has developed screening tables for evaluating localized impacts from NO_X, CO, PM_{10}, and $PM_{2.5}$ based on the thresholds shown in the Ambient Air Quality for Criteria Pollutants section of Table 3.2-4. The proposed construction activities would be spread over an existing facility and it would disturb an approximately 19-acre area. However, the proposed project would be constructed in phases and each phase would disturb a different size area. The URBEMIS2007 model was used to determine the acreage of the construction effort for each phase and the emissions associated with each phase. Because dispersion modeling is based on an emissions-per-unit area and not the total emissions associated with each phase, the worst-case scenario is associated with the smaller areas of construction that result in a higher concentration per unit. In the case of CO and NO_x, Phase 5 of construction results in the higher concentrations of emissions with the smallest area disturbed (1.58 acres), whereas Phase 1 construction results in the highest concentration for PM_{10} and $PM_{2.5}$ with the smallest area (1.95 acres). Table 3.2-9 shows the calculated on-site constructions emissions data and threshold values for each pollutant based on the SCAQMD screening tables.

TABLE 3.2-9 LOCAL EMISSIONS ANALYSIS

Pollutant	Maximum Daily Emissions[1] lbs/day	LST Threshold[2] lbs/day	Exceed Threshold?
NOx	22	140	No
CO	12	423	No
PM_{10}[4]	1	4	No
$PM_{2.5}$[4]	1	3	No
Source: Synectecology 2008.			

As shown in Table 3.2-9, all short-term localized emissions values would be less than the LST thresholds. The impact would be less than significant, and no mitigation measures would be required.

LONG-TERM LOCALIZED IMPACTS

Long-term emissions also have the potential to exceed ambient air quality standards. Because operational emissions are mostly the product of vehicle travel, these impacts are typically produced along roadways. Because CO is produced in greatest quantities from vehicle combustion and does not readily disperse into the atmosphere, adherence to ambient air quality standards is typically demonstrated through an analysis of localized CO concentrations.

Areas of vehicle congestion have the potential to create pockets of CO called hot spots. These hot spots typically occur at intersections where vehicle speeds are reduced and idle time is increased. These

pockets of CO have the potential to exceed the state ambient air quality 1-hour standard of 20 ppm or the 8-hour standard of 9 ppm. Typically for an intersection to exhibit a significant CO concentration, it would operate at level of service D or worse. Intersection movements are based on data included in the traffic study and include ambient growth, the project, and related projects. Modeling was performed using 2018 "Future With Project" traffic volumes and emissions factors. As a reasonable worst-case scenario, the analysis assumes the retention of the existing intersection capacity and does not consider measures outlined in the traffic analysis to improve traffic flow through the project area. Table 3.2-10 presents those intersections in the study area that meet or exceed level of service D and would receive project-related traffic.

TABLE 3.2-10 CO SCREENING

Intersection	Level of Service	Peak Hour Volume	1-Hour Standard (20 ppm)	8-Hour Standard (9 ppm)
San Gabriel Blvd at Colorado Blvd (a.m.)	E	4,427	8.4	4.4
San Gabriel Blvd at Colorado Blvd (p.m.)	F	4,946	8.4	4.4
San Gabriel Blvd at Del Mar Blvd (a.m.)	E	4,146	8.5	4.5
San Gabriel Blvd at Del Mar Blvd (p.m.)	F	4,345	8.4	4.4
San Gabriel Blvd at San Pasqual St (a.m.)	E	3,284	8.2	4.2
San Gabriel Blvd at San Pasqual St (p.m.)	F	3,016	8.0	4.1
Madre St at Colorado Blvd (a.m.)	D	3,261	8.1	4.2
Madre St at Colorado Blvd (p.m.)	D	4,217	8.4	4.4
Madre St at Del Mar Blvd (p.m.)	D	2,702	8.0	4.1
As measured at a distance of 10 feet from the corner of the intersection predicting the highest value. CO values include background concentrations of 7.0 and 3.4 ppm for 1- and 8-hour concentrations, respectively. Eight-hour concentrations are based on a persistence factor of 0.7 of the 1-hour concentration. Source: Synectecology 2008				

As shown in the table, the anticipated 1-hour and 8-hour CO concentrations would be less than the thresholds of significance. Thus, the proposed project would not create a CO hot spot, and the impact would be less than significant.

TOXIC AIR CONTAMINANTS

The principal TACs of concern are those that may be generated by demolition of the existing buildings and excavation of contaminated soils. As described in Section 2.5 of this EIR, a preconstruction survey would be required to determine the presence of ACM and LBP. All ACM and LBP would be removed prior to the start of demolition in accordance with DTSC requirements for LBP and the SCAQMD's requirements for ACM (Rule 1403). The applicant must obtain proof of satisfaction of state and regional requirements prior to the start of demolition.

An additional TAC that would be generated during project construction is diesel particulate matter (diesel PM). Diesel PM would be generated in the exhaust of diesel engine construction equipment. During construction, there would be persons at the residential and commercial uses adjacent to the project site.

The dose to which receptors are exposed is the primary factor used to determine health risk (i.e., potential exposure to TAC emission levels that exceed applicable standards). Dose is a function of the concentration of a substance or substances in the environment and the duration of exposure to the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the maximally exposed individual. Thus, the risks estimated for a maximally exposed individual are higher if a fixed exposure occurs over a longer period of time. According to the Office of Environmental Health Hazard Assessment, health risk assessments, which determine the exposure of sensitive receptors to TAC emissions, should be based on a 70-year exposure period; however, such assessments should be limited to the period/duration of construction activities associated with the project. Thus, because the use of diesel engine construction equipment would occur over a period of a few years, it would not meet the criteria for a 70-year exposure period. Accordingly, short-term construction activities would not result in exposure of sensitive receptors to substantial TAC emissions.

While residential and most commercial uses are not associated with the release of TACs, some commercial uses, including hospitals and medical centers, have been identified with the use of toxic substances and release of toxic emissions. Vehicle emissions primarily associated with the use of heavy trucks for activities such as refuse collection also release diesel PM, which is a known carcinogen. However, the use of trucks during project operation would account for approximately 1.4 percent of the vehicle trips generated at the proposed project site and these emissions are distributed over a vast area. As such, vehicle travel is not typically associated with prolonged exposure to toxic emissions.

Under SCAQMD Rule 1401 (New Source Review of Carcinogenic Air Contaminants), the SCAQMD enforces emissions limits when a new facility applies for permits for new construction, modifications, or relocation of equipment that emits any TACs listed therein. Permits are granted if the increase in cancer risk from the new, modified, or relocated source does not exceed one in a million or a 10 in a million cancer cases, if the proposed controls are the best available and the equipment is supplied with Toxic-Best Available Control Technology. SCAQMD Rule 402 prohibits emissions of air pollutants that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause or have a natural tendency to cause injury or damage to business or property. Mandatory adherence to the SCAQMD rules would ensure a less than significant impact to TACs during project operation.

AIR-4: *The proposed project would not conflict with the state goal for reducing greenhouse gas emission, and thereby, have a negative impact on global climate change.*

The proposed project would not conflict with implementation of state goals for reducing greenhouse gas emissions. With regard to new projects in California, GHG impacts are nearly always exclusively cumulative impacts; there are no non-cumulative GHG emission impacts from a climate change perspective (CAPCOA 2008, AEP 2007). As with other individual relatively small projects (i.e., projects that are not cement plants, oil refineries, electric generating facilities/providers, cogeneration facilities, or

hydrogen plants or other stationary combustion sources that emit more than 25,000 $MMTCO_2e$ per year), the primary concern would be whether the project would be in conflict with the goals of Assembly Bill 32 for reducing greenhouse gas emissions.

Three types of analyses are used to determine whether the proposed project would be in conflict with the state goals for reducing greenhouse gas emissions. The analyses are reviews of:

A. Potential conflicts with the ARB early action strategies (see Table 3.2-4);

B. The relative size of the project in comparison to the estimated greenhouse gas reduction goal of 174 $MMTCO_2e$ by 2020 and in comparison to the size of major facilities that are required to report greenhouse gas emissions (25,000 metric tons of CO_2e per year) (ARB 2007g); and

C. The basis parameters of the proposed project to determine whether its design is inherently energy efficient.

With regard to Item A, the proposed project does not present any apparent conflict with the most recent list of the ARB early action strategies (see Table 3.2-4). With regard to Item B, project construction greenhouse gas emissions would generate a total of approximately 1,279 tons of CO_2 produced over the approximately 1,006 days of active construction activity. Project operation would generate approximately 8.27 tons of CO_2 daily, or about 3,020 tons per year. The proposed project would not be classified as a major source of greenhouse gas emissions.

In accordance with the 2007 AQMP, the emissions levels in California are estimated to be 473 $MMTCO_2e$ for 2000 and 532 $MMTCO_2e$ for 2010. Year 2009 (the worst-case scenario year on which emissions are based) is then extrapolated to 526.1 $MMTCO_2e$ (579.9 short tons). At approximately 3,020 tons per year, the proposed project operations represented about 0.0005 percent of California's annual CO_2 emissions budget.

With regard to Item C, the proposed project is subject to all Title 24 building standards for energy efficiency. In addition, Pasadena has numerous "green" requirements already in place (e.g., trip reduction requirements, transit-oriented development requirements, and green building standards). Of note, the proposed project must comply with the City's Green Building Ordinance, which requires new construction to be built in a way that is capable of being certified by the U.S. Green Building Council under the Leadership in Energy and Environmental Design (LEED) standards. The applicant would have the option of purchasing energy produced from renewable resources and install energy saving features, both of which would reduce greenhouse gas emissions. Additionally, the project site would need to comply with the City's transportation demand management requirements, which encourage carpooling, vanpooling, use of public transit, bicycling, and walking. Compliance with City regulations would further reduce the greenhouse gas emissions generated by the proposed project during operation. In addition, the applicant has agreed to voluntary conditions to further reduce greenhouse gas emissions, including but not limited to, providing bicycle parking, preferential parking for alternative fuel vehicles,

using drought resistant landscaping, using energy efficient appliances, and installing light colored paving materials.

Based on project construction and operation greenhouse gas emissions estimates, it is not anticipated that the proposed project alone would substantially add to the global inventory of greenhouse gas emissions. The operational emission of greenhouse gases from the proposed project would be about 0.0005 percent of the California's current greenhouse gas emissions. Recognizing that there is a great amount of public concern regarding greenhouse gas emissions, the majority of the information given above is for disclosure purposes as required by CEQA. There is no agreement among air quality experts, or guidance at the state level, regarding the level at which an individual project's incremental greenhouse gas effects is cumulatively considerable. Given the emerging level of experience within the air quality industry with greenhouse gas emissions analyses, coupled with the fact that the policies implementing the state goal of reducing greenhouse gas emissions in California to 1990 levels by 2020, as set forth in the timetable established in the California Global Warming Solutions Act of 2006 (Assembly Bill 32) have not been adequately defined, there is no way to state within reasonable scientific certainty that the proposed project would conflict with these policies. The impact would be less than significant, and no mitigation measures are required.

It should be noted that global climate change would not be expected to have a substantial impact on the proposed project. The project location would not be affected by minor changes in sea level and the proposed project would not require a substantial volume of water resources so any changes in available water resources resulting from climate change would not have a substantial effect on the viability of the proposed project.

3.2.4 Mitigation Measures

AIR-A During construction, the construction contractor shall only use paint that contains no more than 0.22 pounds/gallon (100 grams/liter) of volatile organic compounds (VOCs).

3.2.5 Significance after Mitigation

With the implementation of mitigation measure AIR-A, construction VOC emissions would be reduced to 73 and 32 pounds per day during Phase 2 and 5 respectively, which is below the SCAQMD daily emissions thresholds of 75 pounds per day. Thus, with mitigation the proposed project would not violate an air quality standard. Operation of the proposed project would not exceed SCAQMD daily emissions thresholds. As described in AIR-2 above, construction and operation of the proposed project would not contribute to a cumulatively considerable air quality impact. The proposed project would not expose sensitive receptors to substantial pollutant emissions during construction and operation. Based on project construction and operation greenhouse gas emissions estimates, it is not anticipated that the proposed project alone would substantially add to the global inventory of greenhouse gas emissions. Further, the proposed project would be consistent with state goals of reducing greenhouse gas emissions. Impacts related to air quality would be less than significant.

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