4.2 AIR QUALITY AND GLOBAL CLIMATE CHANGE

INTRODUCTION

This section describes the ambient air quality of the local and regional area and provides a comparison of existing air quality to applicable federal, state, and local air pollutant standards. In addition, sources of air emissions near the proposed project site are identified and discussed. This section also identifies the plans and policies developed in efforts to improve air quality. Finally, this section evaluates potential air quality impacts associated with the project and identifies mitigation measures to reduce potential impacts. Sources utilized in this discussion include the South Coast Air Quality Management District (SCAQMD) Air Quality Analysis Guidance Handbook (Handbook) and air quality data from the SCAQMD, the California Air Resources Board (CARB), and the U.S. Environmental Protection Agency (EPA). Emission calculations and air quality modeling conducted for the project are provided in ***Appendix 4.2****.*

ENVIRONMENTAL SETTING

Regional Climate

The project is located in the South Coast Air Basin (SoCAB), which is shown in **Figure 4.2-1, South Coast Air Basin**. The SoCAB consists of Orange County, Los Angeles County (excluding the Antelope Valley portion), and the western, non-desert portions of San Bernardino and Riverside Counties.

Air quality is affected by both the rate and location of pollutant emissions. Meteorological conditions such as wind speed, wind direction, solar radiation, atmospheric stability, along with local topography heavily influence air quality by affecting the movement and dispersal of pollutants. Predominant meteorological conditions in the SoCAB are primarily light winds and shallow vertical mixing due to low-altitude temperature inversion. These conditions, when coupled with the surrounding mountain ranges, hinder the regional dispersion of air pollutants. The strength and location of a semi-permanent, high-pressure cell over the northern Pacific Ocean is the primary climatological influence on the SoCAB, as is the ocean, which moderates the local climate by acting like a large heat reservoir. As a result of these influences, warm summers, mild winters, infrequent rainfall and moderate humidity typify climatic conditions through most of the Basin. These meteorological conditions, in combination with regional topography, are conducive to the formation and retention of ozone (O_3) and urban smog.

Annual average temperatures throughout the SoCAB vary from the low to middle 60s degrees Fahrenheit (°F). However, due to decreased marine influence, the eastern portion of the Basin shows greater variability in average annual minimum and maximum temperatures. January is the coldest month throughout the SoCAB, and annual average minimum temperatures are 56°F in downtown Los Angeles, 49°F in San Bernardino, and 55°F in Long Beach. July and August are the warmest months in the SoCAB,

and annual average maximum temperatures are 83°F in downtown Los Angeles, 95°F in San Bernardino, and 85°F in Long Beach. All portions of the SoCAB have recorded maximum temperatures above 100°F.

Although the climate of the SoCAB can be characterized as semi arid, the air near the land surface is quite moist on most days because of the presence of a marine layer. Humidity restricts visibility in the SoCAB, also increase the conversion of SO_2 to sulfates. The annual average relative humidity is 71 percent along the coast and 59 percent inland. Because the ocean effect is dominant, periods of heavy early morning fog are frequent and low stratus clouds are a characteristic feature. These effects decrease with distance from the coast. More than 90 percent of the rainfall occurs from November through April. Annual average rainfall varies from approximately 9 inches in Riverside to 14 inches in downtown Los Angeles. Monthly and yearly rainfall totals are extremely variable. Summer rainfall usually consists of widely scattered thundershowers near the coast and slightly heavier shower activity in the eastern portion of the region near the mountains.

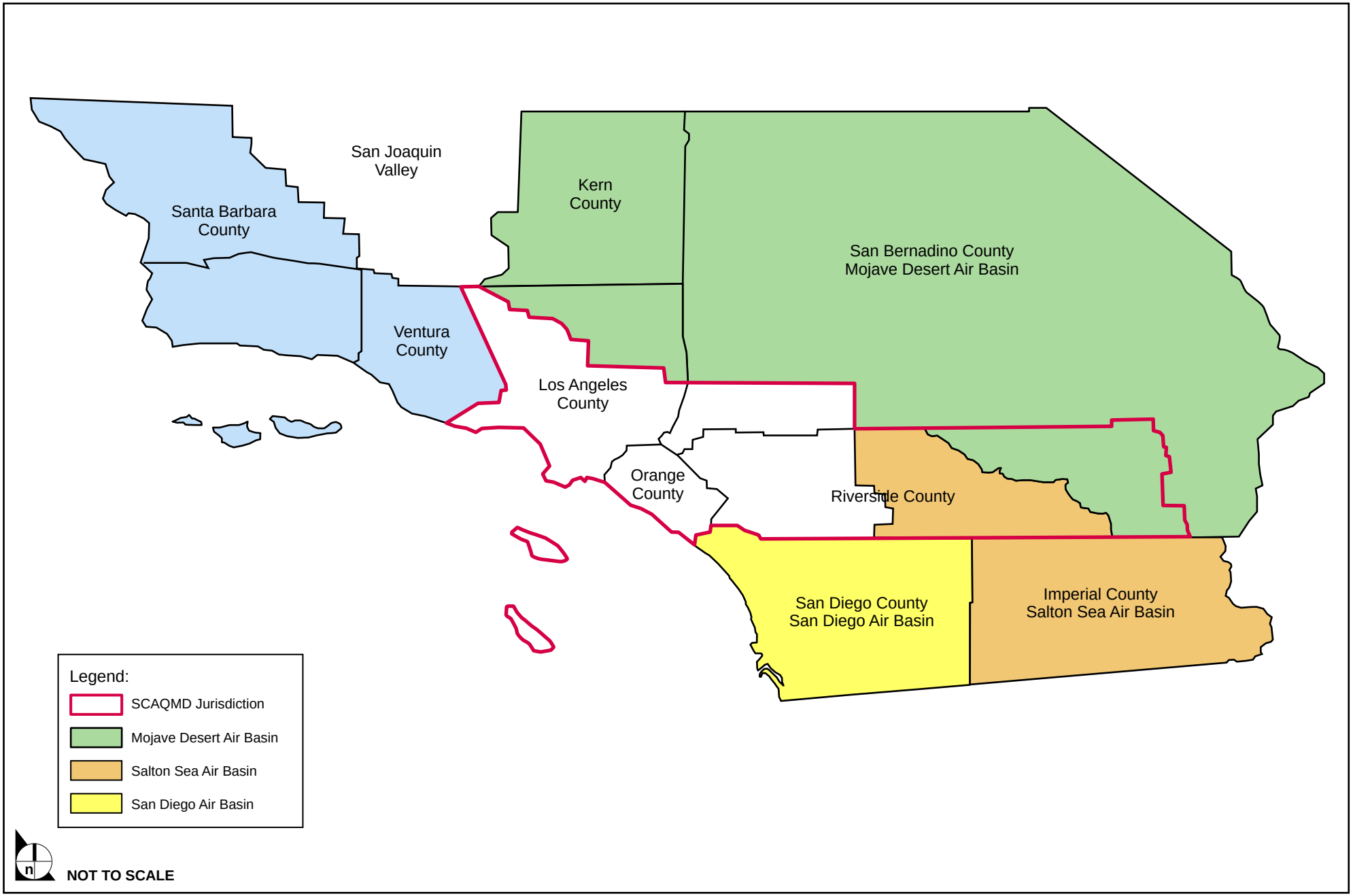
The South Coast Air Quality Management District (SCAQMD) operates stations in the SoCAB that monitor meteorological conditions and pollutant concentrations. Wind speeds and directions for the area are taken from the monitoring station located nearest to the project site and are shown in **Figure 4.2-2, Wind Rose for Source Receptor Area 7**. As shown, predominant winds are from the south and southeast between 5 and 10 miles per hour. The average maximum temperature in the Glendale area is 87°F and the average minimum is 40°F.[1] The average annual rainfall is 16.4 inches.[2]

Regional Air Quality

The U.S. EPA is responsible for enforcing the federal Clean Air Act and the National Ambient Air Quality Standards (NAAQS). The NAAQS identify levels of air quality for seven criteria pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable particulate matter (PM10), fine particulate matter (PM2.5), and lead. The California Air Resources Board (CARB), a branch of the California Environmental Protection Agency (CalEPA), oversees air quality planning and control throughout California. It is primarily responsible for ensuring implementation of the California Clean Air Act, responding to the federal Clean Air Act requirements, and regulating emissions from motor vehicles and consumer products within California. CARB makes area designations for 10 criteria pollutants: O_3,

1 Western Regional Climate Center, "Glendale Kennedy (Station 043450)," http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca3450. n.d.

2 Ibid.



SOURCE: Impact Sciences, Inc. – June 2010

FIGURE **4.2-1**

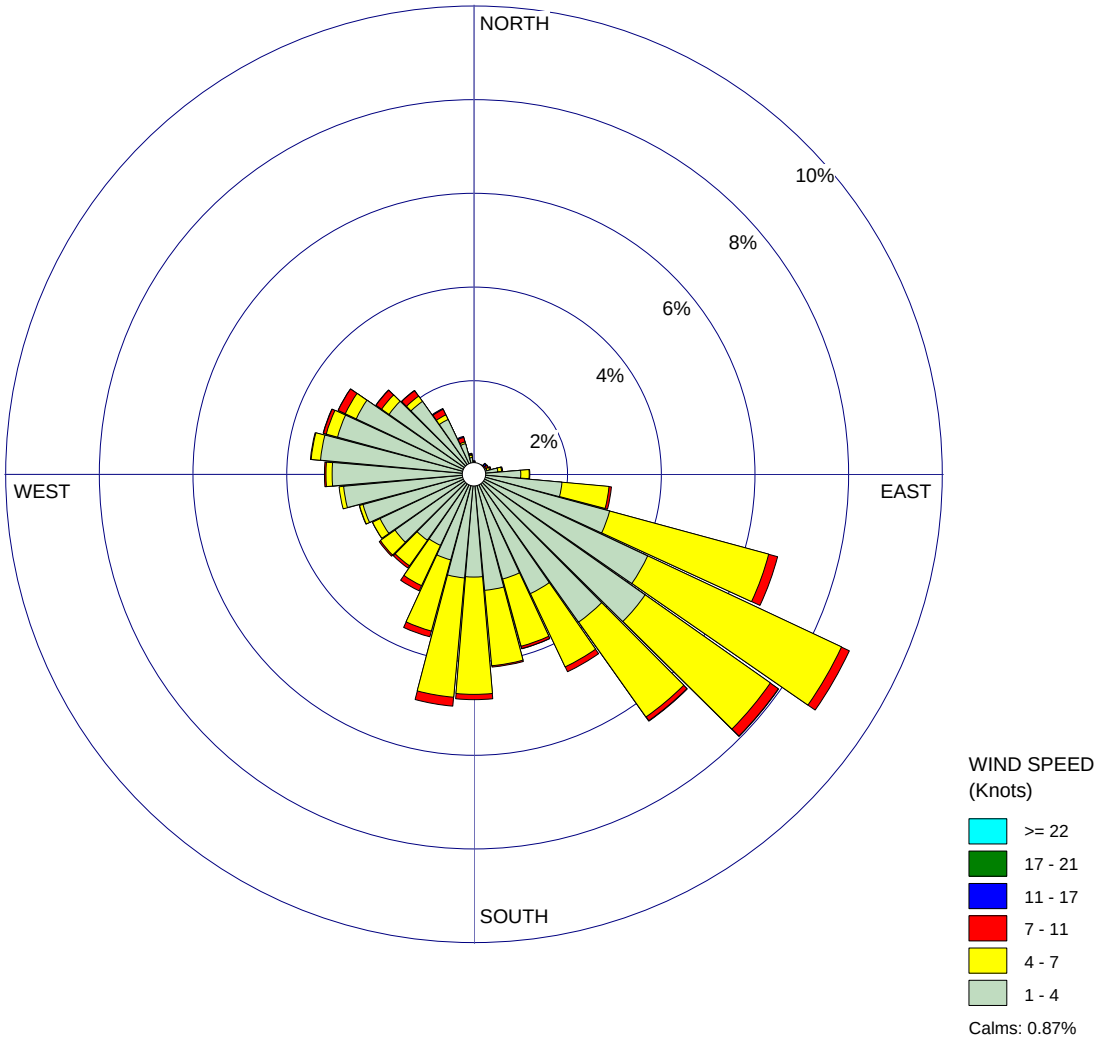
South Coast Air Basin

WIND ROSE PLOT:

BURBANK MONITORING STATION

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:	DATA PERIOD:	COMPANY NAME:	
Meteorological Data File from the South Coast Air Quality Management District	**2005-2007** **Jan 1 - Dec 31** **00:00 - 23:00**	**Impact Sciences, Inc.**	
	CALM WINDS: **0.87%**	TOTAL COUNT: **26164 hrs.**	
	AVG. WIND SPEED: **3.54 Knots**	DATE: **6/29/2010**	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

SOURCE: South Coast Air Quality Management District – June 2010

FIGURE **4.2-2**

Wind Rose for Source Receptor Area 7

CO, NO_2, SO_2, PM10, PM2.5, sulfates, lead, hydrogen sulfide, and visibility-reducing particles.[3] CARB designated the management of air quality in the South Coast Air Basin (SoCAB) to the South Coast Air Quality Management District (SCAQMD). The SCAQMD is primarily responsible for controlling stationary sources of emissions in the SoCAB and for developing regional air quality plans that demonstrate compliance with federal and state air quality standards.

Air pollutants of concern in the SoCAB are primarily generated by two categories of sources: stationary and mobile. Stationary sources are known as "point sources," which have one or more emission sources at a single facility, or "area sources," which are widely distributed emissions. Point sources are usually associated with manufacturing and industrial uses and include sources such as refinery boilers or combustion equipment that produces electricity or process heat. Examples of area sources include residential water heaters, painting operations, lawn mowers, agricultural fields, landfills, and consumer products, such as lighter fluid or hair spray. Mobile sources refer to operational and evaporative emissions from motor vehicles. Mobile sources account for approximately 59 percent of the volatile organic compound (VOC) emissions, 90 percent of the nitrogen oxides (NO_X) emissions, 95 percent of the CO emissions, 55 percent of the sulfur oxides (SO_X) emissions, 15 percent of the PM10 emissions, and 34 percent of the PM2.5 emissions found within the SoCAB.[4]

The criteria pollutants relevant to the project and of concern in the SoCAB are briefly described below. While VOCs are not considered to be criteria pollutants, they are widely emitted from land use development projects and participate in photochemical reactions in the atmosphere to form O_3; therefore, VOCs are relevant to the project and are of concern in the SoCAB.

- **Ozone (O_3).** O_3 is a gas that is formed when volatile organic compounds (VOCs) and nitrogen oxides (NO_X), both byproducts of internal combustion engine exhaust and other sources undergo slow photochemical reactions in the presence of sunlight. Ozone concentrations are generally highest during the summer months when direct sunlight, light wind, and warm temperature conditions are favorable to the formation of this pollutant.

- **Volatile Organic Compounds (VOCs).** VOCs are compounds comprised primarily of atoms of hydrogen and carbon. Internal combustion associated with motor vehicle usage is the major source of

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3 California Air Resources Board, "Area Designations (Activities and Maps)," http://www.arb.ca.gov/desig/desig.htm. 2010. According to California Health and Safety Code, Section 39608, "state board, in consultation with the districts, shall identify, pursuant to subdivision (e) of Section 39607, and classify each air basin which is in attainment and each air basin which is in nonattainment for any state ambient air quality standard." Section 39607(e) states that the State shall "establish and periodically review criteria for designating an air basin attainment or nonattainment for any state ambient air quality standard set forth in Section 70200 of Title 17 of the California Code of Regulations. California Code of Regulations, Title 17, Section 70200 does not include vinyl chloride; therefore, CARB does not make area designations for vinyl chloride.

4 California Air Resources Board, "2008 Estimated Annual Average Emissions – South Coast Air Basin," http://www.arb.ca.gov/ei/maps/basins/abscmap.htm. 2009.

hydrocarbons. Adverse effects on human health are not caused directly by VOCs, but rather by reactions of VOCs to form secondary air pollutants, including ozone. VOCs are also referred to as reactive organic compounds (ROCs) or reactive organic gases (ROGs). VOCs themselves are not "criteria" pollutants; however, they contribute to formation of O_3.

- **Nitrogen Dioxide (NO_2).** NO_2 is a reddish-brown, highly reactive gas that is formed in the ambient air through the oxidation of nitric oxide (NO). NO_2 is also a byproduct of fuel combustion. The principle form of NO_2 produced by combustion is NO, but NO reacts quickly to form NO_2, creating the mixture of NO and NO_2 referred to as oxides of nitrogen (NO_X). NO_2 acts as an acute irritant and, in equal concentrations, is more injurious than NO. At atmospheric concentrations, however, NO_X is only potentially irritating. NO_2 absorbs blue light, the result of which is a brownish-red cast to the atmosphere and reduced visibility.

- **Carbon Monoxide (CO).** CO is 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, unlike ozone, 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.

- **Sulfur dioxide (SO_2).** SO_2 is 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. When sulfur dioxide oxidizes in the atmosphere, it forms sulfates (SO_4).

- **Respirable Particulate Matter (PM10).** PM10 consists of extremely small, suspended particles or droplets 10 microns or smaller in diameter. Some sources of PM10, like pollen and windstorms, are naturally occurring. However, in populated areas, most PM10 is caused by road dust, diesel soot, combustion products, abrasion of tires and brakes, and construction activities.

- **Fine Particulate Matter (PM2.5).** PM2.5 refers to particulate matter that is 2.5 micrometers or smaller in size. The sources of PM2.5 include fuel combustion from automobiles, power plants, wood burning, industrial processes, and diesel-powered vehicles such as buses and trucks. These fine particles are also formed in the atmosphere when gases such as sulfur dioxide, NO_X, and VOCs are transformed in the air by chemical reactions.

- **Lead (Pb).** Pb occurs in the atmosphere as particulate matter. The combustion of leaded gasoline is the primary source of airborne lead in the basin. The use of leaded gasoline is no longer permitted for on-road motor vehicles, so most such combustion emissions are associated with off-road vehicles such as racecars that use leaded gasoline. Other sources of Pb include the manufacturing and recycling of batteries, paint, ink, ceramics, ammunition, and secondary lead smelters.

The U.S. Environmental Protection Agency (U.S. EPA) is the federal agency responsible for setting the NAAQS. Air quality of a region is considered to be in attainment of the NAAQS if the measured ambient air pollutant levels are not exceeded more than once per year, except for O_3, PM10, PM2.5 and those based on annual averages or arithmetic mean. The NAAQS for O_3, PM10, and PM2.5 are based on statistical calculations over one- to three-year periods, depending on the pollutant. The California Air

Resources Board (CARB) is the state agency responsible for setting the California Ambient Air Quality Standards (CAAQS). Air quality of a region is considered to be in attainment of the CAAQS if the measured ambient air pollutant levels for O_3, CO, NO_2, SO_2, PM10, PM2.5, and lead are not exceeded, and all other standards are not equaled or exceeded at any time in any consecutive three-year period. The NAAQS and CAAQS for each of the monitored pollutants and their effects on health are summarized in **Table 4.2-1, Ambient Air Quality Standards**.

Table 4.2-1
Ambient Air Quality Standards

Air Pollutant	Concentration/Averaging Time		Most Relevant Health Effects
	State Standard (CAAQS)	Federal Primary Standard (NAAQS)	
Ozone	0.09 ppm, 1-hr. avg. 0.070 ppm, 8-hr avg.	0.075 ppm, 8-hr avg. (3-year average of annual 4th-highest daily maximum)	(a) Pulmonary function decrements and localized lung edema in humans and animals; (b) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (c) Increased mortality risk; (d) Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (e) Vegetation damage; and (f) Property damage
Nitrogen Dioxide[1]	0.18 ppm, 1-hr avg. 0.030 ppm, annual arithmetic mean	0.100 ppm, 1-hr avg. (3-year avg. of the 98th percentile of the daily maximum 1-hour avg.) 0.053 ppm, annual arithmetic mean	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extrapulmonary biochemical and cellular changes and pulmonary structural changes; and (c) Contribution to atmospheric discoloration
Carbon Monoxide	20 ppm, 1-hr avg. 9.0 ppm, 8-hr avg.	35 ppm, 1-hr avg. (not to be exceeded more than once per year) 9 ppm, 8-hr avg. (not to be exceeded more than once per year)	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; and (d) Possible increased risk to fetuses
Sulfur Dioxide[2]	0.25 ppm, 1-hr. avg. 0.04 ppm, 24-hr avg.	0.075 ppm, 1-hr avg. (3-year avg. of the 99th percentile)	Bronchoconstriction accompanied by symptoms, which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in person with asthma

Air Pollutant	Concentration/Averaging Time		Most Relevant Health Effects
	State Standard (CAAQS)	Federal Primary Standard (NAAQS)	
Respirable Particulate Matter (PM10)	50 μg/m³, 24-hr avg. 20 μg/m³, annual arithmetic mean	150 μg/m³, 24-hr avg. (not to be exceeded more than once per year on average over 3 years)	(a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Declines in pulmonary function growth in children; and (c) Increased risk of premature death from heart or lung diseases in the elderly
Fine Particulate Matter (PM2.5)	12 μg/m³, annual arithmetic mean	35 μg/m³, 24-hr avg. (3-year average of 98th percentile) 15 μg/m³, annual arithmetic mean (3-year average)	(a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Declines in pulmonary function growth in children; and (c) Increased risk of premature death from heart or lung diseases in the elderly
Lead[3]	1.5 μg/m³, 30-day avg.	1.5 μg/m³, calendar quarter 0.15 μg/m³, 3-month rolling average	(a) Increased body burden, and (b) Impairment of blood formation and nerve conduction
Visibility-Reducing Particles	Reduction of visual range to less than 10 miles at relative humidity less than 70%, 8-hour avg. (10 AM–6 PM)	None	Visibility impairment on days when relative humidity is less than 70%.
Sulfates	25 μg/m³, 24-hr avg.	None	(a) Decrease in ventilatory function, (b) Aggravation of asthmatic symptoms, (c) Aggravation of cardio-pulmonary disease, (d) Vegetation damage, (e) Degradation of visibility, and (f) Property damage
Hydrogen Sulfide	0.03 ppm, 1-hr avg.	None	Odor annoyance
Vinyl Chloride[3]	0.01 ppm, 24-hr avg.	None	Known carcinogen

Source: South Coast Air Quality Management District, Final Program Environmental Impact Report for the 2007 Air Quality Management Plan*, (2007) Table 3.1-1, p. 3.1-3.*

μg/m³ = microgram per cubic meter.

ppm = parts per million by volume.

[1] *On January 25, 2010, the U.S. EPA promulgated a new 1-hour NO_2 standard. The new 1-hour standard is 0.100 parts per million (188 micrograms per cubic meter [μg/m³]) and became effective on April 12, 2010.*

[2] *On June 3, 2010, the U.S. EPA issued a new 1-hour SO_2 standard. The new 1-hour standard is 0.075 parts per million (196 μg/m³). The U.S. EPA also revoked the existing 24-hour and annual standards citing a lack of evidence of specific health impacts from long-term exposures. The new 1-hour standard becomes effective 60 days after publication in the Federal Register.*

[3] *CARB 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.*

In addition to criteria pollutants, the SCAQMD periodically assesses levels of toxic air contaminants (TACs) in the SoCAB. TACs are defined by California Health and Safety Code Section 39655:

> *"Toxic air contaminant" means an air pollutant which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health. A substance that is listed as a hazardous air pollutant pursuant to subsection (b) of Section 112 of the federal act (42 U.S.C. Sec. 7412(b)) is a toxic air contaminant.*

Between April 2004 and March 2006, the SCAQMD conducted the Multiple Air Toxics Exposure Study III (MATES III), which is a follow-up to previous MATES I and II air toxics studies conducted in the South Coast Air Basin. The MATES III Final Report was issued in September 2008. The MATES III study, based on actual monitored data throughout the Basin, consisted of several elements. These included a monitoring program, an updated emissions inventory of toxic air contaminants, and a modeling effort to characterize carcinogenic risk across the South Coast Air Basin from exposure to toxic air contaminants. The MATES III study applied a 2-kilometer (1.24-mile) grid over the South Coast Air Basin and reported carcinogenic risk within each grid space (covering an area of 4 square kilometers or 1.54 square miles). The study concluded that the average of the modeled air toxics concentrations measured at each of the monitoring stations in the South Coast Air Basin equates to a background cancer risk of approximately 1,200 in 1,000,000 primarily due to diesel exhaust. The MATES III study also concluded lower ambient concentrations of most of the measured air toxics compared to the levels measured in the previous MATES II study conducted during 1998 and 1999. Specifically, benzene and 1,3-butadiene, pollutants generated mainly from vehicles, were down 50 percent and 73 percent, respectively.[5] The reductions were attributed to air quality control regulations and improved emission control technologies.

Local Air Quality

The SCAQMD has divided the SoCAB into Source Receptor Areas in which air quality monitoring stations are operated. The project site is located in the East San Fernando Valley Source Receptor Area (SRA 7). The monitoring station for this area is located at 228 W Palm Avenue in the City of Burbank, California (Station Nos. 069), just over 4 miles northwest of the project site. This station monitors emission levels of CO, O_3, NO_2, SO_2, PM10, and PM2.5.

Table 4.2-2, Ambient Pollutant Concentrations Registered in Source Receptor Area 7, lists the ambient pollutant concentrations registered and the exceedances of state and federal standards that have occurred at the abovementioned monitoring station from 2006 through 2008, the most recent years in which data is available from the SCAQMD. As shown, the monitoring station has registered values above state and

5 South Coast Air Quality Management District, *Multiple Air Toxics Exposure Study in the South Coast Air Basin (MATES III) – Draft Report*, (2008) ES-2.

federal standards for O_3, the state standard for PM10, and the federal standard for PM2.5. Values for lead and sulfate are not presented in the table below since ambient concentrations are well below the state standards in the area. Hydrogen sulfide, vinyl chloride, and visibility reducing particles were not monitored by CARB or the SCAQMD in Los Angeles County during the period of 2006 to 2008.

Table 4.2-2
Summary of Ambient Air Pollutant Concentrations in Source Receptor Area 7

Pollutant	Standards[1]	Year		
		2006	2007	2008
OZONE (O_3)				
Maximum 1-hour concentration monitored (ppm)		0.17	0.116	0.133
Maximum 8-hour concentration monitored (ppm)		0.128	0.096	0.109
Number of days exceeding state 1-hour standard	0.09 ppm	25	13	20
Number of days exceeding state 8-hour standard	0.070 ppm	23	19	35
Number of days exceeding federal 8-hour standard[2]	0.075 ppm	22	13	17
NITROGEN DIOXIDE (NO_2)				
Maximum 1-hour concentration monitored (ppm)		0.10	0.09	0.11
Annual average concentration monitored (ppm)		0.0274	0.0289	0.0285
Number of days exceeding state 1-hour standard	0.18 ppm	0	0	0
CARBON MONOXIDE (CO)				
Maximum 1-hour concentration monitored (ppm)		4	4	3
Maximum 8-hour concentration monitored (ppm)		3.5	2.8	2.6
Number of days exceeding 1-hour standard	20 ppm	0	0	0
Number of days exceeding 8-hour standard	9.0 ppm	0	0	0
SULFUR DIOXIDE (SO_2)				
Maximum 1-hour concentration monitored (ppm)		0.01	0.01	0.01
Maximum 24-hour concentration monitored (ppm)		0.004	0.003	0.003
Number of days exceeding state 1-hour standard	0.25 ppm	0	0	0
Number of days exceeding state 24-hour standard	0.04 ppm	0	0	0
RESPIRABLE PARTICULATE MATTER (PM10)				
Maximum 24-hour concentration monitored ($\mu g/m^3$)		71	109	66
Annual average concentration monitored ($\mu g/m^3$)		35.6	40.0	35.6
Number of samples exceeding state standard	50 $\mu g/m^3$	10	11	7
Number of samples exceeding federal standard	150 $\mu g/m^3$	0	0	0
FINE PARTICULATE MATTER (PM2.5)				
Maximum 24-hour concentration monitored ($\mu g/m^3$)		50.7	56.5	57.5
Annual average concentration monitored ($\mu g/m^3$)		16.6	16.8	14.1
Number of samples exceeding federal standard	35 $\mu g/m^3$	6	9	2

Source: California Air Resources Board, "Air Quality Data Statistics," http://www.arb.ca.gov/adam/. 2010.
NA = not available
[1] *Parts by volume per million of air (ppm), micrograms per cubic meter of air ($\mu g/m^3$), or annual arithmetic mean (aam).*
[2] *The 8-hour federal O_3 standard was revised from 0.08 ppm to 0.075 ppm in March 2008. The statistics shown are based on the 2008 standard of 0.075 ppm.*

Global Climate Change

Description of the Global Climate Change and the Greenhouse Effect

Global climate change refers to any significant change in climate measurements, such as temperature, precipitation, or wind, lasting for an extended period (i.e., decades or longer).[6] Climate change may result from:

- natural factors, such as changes in the sun's intensity or slow changes in the Earth's orbit around the sun;
- natural processes within the climate system (e.g., changes in ocean circulation, reduction in sunlight from the addition of GHG and other gases to the atmosphere from volcanic eruptions); and
- human activities that change the atmosphere's composition (e.g., through burning fossil fuels) and the land surface (e.g., deforestation, reforestation, urbanization, desertification).

The third bullet is the focus of climate change legislation. The natural process through which heat is retained in the troposphere[7] is called the "greenhouse effect." The greenhouse effect traps heat in the troposphere through a three-fold process as follows: (1) short-wave radiation in the form of visible light emitted by the Sun is absorbed by the Earth as heat; (2) long-wave radiation is re-emitted by the Earth; and (3) greenhouse gases (GHGs) in the atmosphere absorb or trap the long-wave radiation and re-emit it back towards the Earth and into space.

While water vapor and CO_2 are the most abundant GHG, other trace GHGs have a greater ability to absorb and re-radiate long-wave radiation. To gauge the potency of GHGs, scientists have established a Global Warming Potential (GWP) for each GHG based on its ability to absorb and re-emit long-wave radiation over a specific period. The GWP of a gas is determined using CO_2 as the reference gas with a GWP of 1 over 100 years. For example, a gas with a GWP of 10 is 10 times more potent than CO_2 over 100 years. The use of GWP allows GHG emissions to be reported using CO_2 as a baseline. The sum of each GHG multiplied by its associated GWP is referred to as carbon dioxide equivalents (CO_2e). This essentially means that 1 metric ton of a GHG with a GWP of 10 has the same climate change impacts as 10 metric tons of CO_2.

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6 U.S. Environmental Protection Agency, "Glossary of Climate Change Terms," http://www.epa.gov /climatechange/glossary.html#Climate_change. 2009.

7 The troposphere is the bottom layer of the atmosphere, which varies in height from the Earth's surface to 10 to 12 kilometers.

Greenhouse Gases

The compounds described below are GHGs subject to control under state law.[8] As noted above, water vapor is a GHG; however, it's concentration in the atmosphere is a function of temperature and vapor pressure and cannot be controlled by any known means; therefore, water vapor is not subject to control under state law.

- **Carbon Dioxide (CO_2)**. Carbon dioxide primarily is generated by fossil fuel combustion from stationary and mobile sources. Due to the emergence of industrial facilities and mobile sources over the past 250 years, the concentration of carbon dioxide in the atmosphere has increased 35 percent.[9] Carbon dioxide is the most widely emitted GHG and is the reference gas (GWP of 1) for determining the GWP of other GHGs. In 2004, 83.8 percent of California's GHG emissions were carbon dioxide.[10]

- **Methane (CH_4)**. Methane is emitted from biogenic sources, incomplete combustion in forest fires, landfills, manure management, and leaks in natural gas pipelines. In the United States, the top three sources of methane are landfills, natural gas systems, and enteric fermentation.[11] Methane is the primary component of natural gas, which is used for space and water heating, steam production, and power generation. The GWP of methane is 21.

- **Nitrous Oxide (N_2O)**. Nitrous oxide is produced by both natural and human-related sources. Primary human-related sources include agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic acid production, and nitric acid production. The GWP of nitrous oxide is 310.

- **Hydrofluorocarbons (HFCs)**. HFCs typically are used as refrigerants in both stationary refrigeration and mobile air conditioning. The use of HFCs for cooling and foam blowing is growing, particularly as the continued phase-out of chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) gains momentum. The GWP of HFCs range from 140 for HFC-152a to 6,300 for HFC-236fa.

- **Perfluorocarbons (PFCs)**. Perfluorocarbons are compounds consisting of carbon and fluorine. They primarily are created as a byproduct of aluminum production and semiconductor manufacturing. Perfluorocarbons are potent GHGs with a GWP several thousand times that of carbon dioxide, depending on the specific PFC. Another area of concern regarding PFCs is their long atmospheric lifetime (up to 50,000 years).[12] The GWPs of PFCs range from 5,700 to 11,900.

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8 All GWPs are given as 100-year GWP. Unless noted otherwise, all GWPs were obtained from the Intergovernmental Panel on Climate Change. *Climate Change 1995: The Science of Climate Change – Contribution of Working Group I to the Second Assessment Report of the IPCC*. Cambridge (UK): Cambridge University Press, 1996.

9 U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2006 (EPA 430-R-08-005)*, (2008) 1-3.

10 California Energy Commission, *Inventory of California Greenhouse Gas Emissions and Sinks 1990 to 2004*, (2006).

11 U.S. Environmental Protection Agency, "Methane: Sources and Emissions," http://www.epa.gov /methane/sources.html. n.d.

12 U.S. Department of Energy, Energy Information Administration, "Other Gases: Hydrofluorocarbons, Perfluorocarbons, and Sulfur Hexafluoride," http://www.eia.doe.gov/oiaf/1605/gg00rpt/other_gases.html. n.d.

- **Sulfur Hexafluoride (SF_6)**. Sulfur hexafluoride is a colorless, odorless, nontoxic, nonflammable gas. It is most commonly used as an electrical insulator in high voltage equipment that transmits and distributes electricity. Sulfur hexafluoride is the most potent GHG that has been evaluated by the IPCC with a GWP of 23,900. However, its global warming contribution is not as high as the GWP would indicate due to its low mixing ratio, as compared to carbon dioxide (4 parts per trillion [ppt] in 1990 versus 365 parts per million [ppm]).[13]

Contributions to Greenhouse Gas Emissions

Global

Worldwide anthropogenic (man-made) GHG emissions are tracked for industrialized nations (referred to as Annex I) and developing nations (referred to as Non-Annex I). Man-made GHG emissions for Annex I nations are available through 2007. Man-made GHG emissions for Non-Annex I nations are available through 2005. The sum of these emissions totaled approximately 42,133 million metric tons of CO_2 equivalents ($MMTCO_2e$).[14] It should be noted that global emissions inventory data are not all from the same year and may vary depending on the source of the emissions inventory data.[15] Emissions from the top five (5) countries and the European Union accounted for approximately 55 percent of the total global GHG emissions, according to the most recently available data (see **Table 4.2-3, Top Five GHG Producer Countries and the European Union**). The GHG emissions in more recent years may differ from the inventories presented in **Table 4.2-3**; however, the data is representative of currently available inventory data.

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13 U.S. Environmental Protection Agency, "High GWP Gases and Climate Change," http://www.epa.gov/highgwp/scientific.html#sf6. n.d.

14 The CO_2 equivalent emissions commonly are expressed as "million metric tons of carbon dioxide equivalent ($MMTCO_2e$)." The carbon dioxide equivalent for a gas is derived by multiplying the tons of the gas by the associated GWP, such that $MMTCO_2e$ = (million metric tons of a GHG) x (GWP of the GHG). For example, the GWP for methane is 21. This means that the emission of one million metric tons of methane is equivalent to the emission of 21 million metric tons of CO_2.

15 The global emissions are the sum of Annex I and non-Annex I countries, without counting Land-Use, Land-Use Change and Forestry (LULUCF). For countries without 2005 data, the UNFCCC data for the most recent year were used. United Nations Framework Convention on Climate Change, "Annex I Parties – GHG total without LULUCF," http://unfccc.int/ghg_emissions_data/ghg_data_from_unfccc/time_series_annex_i/items/3841.php and "Flexible GHG Data Queries" with selections for total GHG emissions excluding LULUCF/LUCF, all years, and non-Annex I countries, http://unfccc.int/di/FlexibleQueries/Event.do?event= showProjection. n.d.

Table 4.2-3
Top Five GHG Producer Countries and the European Union

Emitting Countries	GHG Emissions ($MMTCO_2e$)
China	7,250
United States	7,217
European Union (EU), 27 Member States	5,402
Russian Federation	2,202
India	1,863
Japan	1,412
Total	**25,346**

Source: World Resources Institute, "Climate Analysis Indicators Tool (CAIT)," http://cait.wri.org/. 2010. Excludes emissions and removals from land use, land-use change and forestry (LULUCF).
Note: Emissions for Annex I nations are based on 2007 data. Emissions for Non-Annex I nations (e.g., China, India) are based on 2005 data).

United States

As noted in **Table 4.2-3**, the United States was the number two producer of GHG emissions. The primary greenhouse gas emitted by human activities in the United States was CO_2, representing approximately 84 percent of total greenhouse gas emissions.[16] Carbon dioxide from fossil fuel combustion, the largest source of U.S. greenhouse gas emissions, accounted for approximately 80 percent of the GHG emissions.[17]

State of California

CARB compiles GHG inventories for the State of California. Based upon the 2008 GHG inventory data (i.e., the latest year for which data are available) for the 2000-2008 greenhouse gas emissions inventory, California emitted 474 $MMTCO_2e$ ***including*** emissions resulting from imported electrical power in 2008.[18] Based on the CARB inventory data and GHG inventories compiled by the World Resources Institute,

16 U.S. Environmental Protection Agency, "Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990–2006," http://www.epa.gov/climatechange/emissions/usinventoryreport.html. 2008.

17 Ibid.

18 California Air Resources Board, "California Greenhouse Gas 2000-2008 Inventory by Scoping Plan Category - Summary," http://www.arb.ca.gov/cc/inventory/data/data.htm. 2010.

California's total statewide GHG emissions rank second in the United States (Texas is number one) with emissions of 417 $MMTCO_2e$ ***excluding*** emissions related to imported power.[19]

The primary contributors to GHG emissions in California are transportation, electric power production from both in-state and out-of-state sources, industry, agriculture and forestry, and other sources, which include commercial and residential activities. **Table 4.2-4, GHG Emissions in California**, provides a summary of GHG emissions reported in California in 1990 and 2008 separated by categories defined by the United Nations Intergovernmental Panel on Climate Change (IPCC).

Table 4.2-4
GHG Emissions in California

Source Category	1990 ($MMTCO_2e$)	Percent of Total	2008 ($MMTCO_2e$)	Percent of Total
ENERGY	**386.41**	**89.2%**	**413.80**	**86.6%**
Energy Industries	157.33	36.3%	171.23	35.8%
Manufacturing Industries & Construction	24.24	5.6%	16.67	3.5%
Transport	150.02	34.6%	173.94	36.4%
Other (Residential/Commercial/Institutional)	48.19	11.1%	46.59	9.8%
Non-Specified	1.38	0.3%	0.00	0.0%
Fugitive Emissions from Oil & Natural Gas	2.94	0.7%	3.28	0.7%
Fugitive Emissions from Other Energy Production	2.31	0.5%	2.09	0.4%
INDUSTRIAL PROCESSES & PRODUCT USE	**18.34**	**4.2%**	**30.11**	**6.3%**
Mineral Industry	4.85	1.1%	5.35	1.1%
Chemical Industry	2.34	0.5%	0.06	0.0%
Non-Energy Products from Fuels & Solvent Use	2.29	0.5%	1.97	0.4%
Electronics Industry	0.59	0.1%	0.80	0.2%
Substitutes for Ozone Depleting Substances	0.04	0.0%	13.89	2.9%
Other Product Manufacture and Use	3.18	0.7%	1.66	0.3%
Other	5.05	1.2%	6.39	1.3%
AGRICULTURE, FORESTRY, & OTHER LAND USE	**19.11**	**4.4%**	**24.42**	**5.1%**
Livestock	11.67	2.7%	16.28	3.4%
Land	0.19	0.0%	0.19	0.0%
Aggregate Sources & Non-CO_2 Sources on Land	7.26	1.7%	7.95	1.7%
WASTE	**9.42**	**2.2%**	**9.41**	**2.0%**
Solid Waste Disposal	6.26	1.4%	6.71	1.4%
Wastewater Treatment & Discharge	3.17	0.7%	2.70	0.6%

19 Ibid.

Source Category	1990 ($MMTCO_2e$)	Percent of Total	2008 ($MMTCO_2e$)	Percent of Total
EMISSIONS SUMMARY				
Gross California Emissions	433.29		477.74	
Sinks from Forests and Rangelands	-6.69		-3.98	
Net California Emissions	426.60		473.76	

Sources:

[1] *California Air Resources Board, "California Greenhouse Gas 1990-2004 Inventory by IPCC Category - Summary," http://www.arb.ca.gov/cc/inventory/archive/archive.htm. 2010.*

[2] *California Air Resources Board, "California Greenhouse Gas 2000-2008 Inventory by IPCC Category - Summary," http://www.arb.ca.gov/cc/inventory/data/data.htm. 2010.*

Between 1990 and 2008, the population of California grew by approximately 7.3 million (from 29.8 to 37.9 million).[20] This represents an increase of approximately 27.2 percent from 1990 population levels. In addition, the California economy, measured as gross state product, grew from $788 billon in 1990 to $1.8 trillion in 2008 representing an increase of approximately 128 percent (over twice the 1990 gross state product).[21] Despite the population and economic growth, California's net GHG emissions only grew by approximately 11 percent. The California Energy Commission (CEC) attributes the slow rate of growth to the success of California's renewable energy programs and its commitment to clean air and clean energy.[22]

Global Ambient CO_2 Concentrations

The impact of anthropogenic activities on global climate change is indicated in the observational record. For example, surface temperature data shows that 11 of the 12 years from 1995 to 2006 rank among the 12 warmest since 1850, the beginning of the instrumental record for global surface temperature.[23] In addition, the atmospheric water vapor content has increased since at least the 1980s over land, sea, and in the upper atmosphere, consistent with the capacity of warmer air to hold more water vapor; ocean temperatures are warmer to depths of 3,000 feet; and a marked decline has occurred in mountain glaciers

20 U.S. Census Bureau, "Data Finders," http://www.census.gov/. 2009; California Department of Finance, "E-5 Population and Housing Estimates for Cities, Counties and the State, 2001-1008, with 2000 Benchmark," http://www.dof.ca.gov/research/demographic/reports/estimates/e-5/2009/. 2010.

21 California Department of Finance, "Financial & Economic Data: Gross Domestic Product, California," http://www.dof.ca.gov/HTML/FS_DATA/LatestEconData/FS_Misc.htm. 2010. Amounts are based on current dollars as of the data of the report (June 2, 2009).

22 California Energy Commission, *Inventory of California Greenhouse Gas Emissions and Sinks 1990 to 2004*, (2006).

23 Intergovernmental Panel on Climate Change, "Climate Change 2007: The Physical Science Basis, Summary for Policymakers," http://ipcc-wg1.ucar.edu/wg1/docs/WG1AR4_SPM_PlenaryApproved.pdf. 2007.

and snowpack in both hemispheres, and in polar ice and ice sheets in both the Arctic and Antarctic regions.[24]

Air trapped by ice has been extracted from core samples taken from polar ice sheets to determine the global atmospheric variation of carbon dioxide, methane, and nitrous oxide from before the start of the industrialization, around 1750, to over 650,000 years ago. For that period, it was found that carbon dioxide concentrations ranged from 180 parts per million (ppm) to 300 ppm. For the period from around 1750 to the present, global carbon dioxide concentrations increased from a pre-industrialization period concentration of 280 ppm to 379 ppm in 2005, with the 2005 value far exceeding the upper end of the pre-industrial period range.[25] Global methane and nitrous oxide concentrations show similar increases for the same period (see **Table 4.2-5, Comparison of Global Pre-Industrial and Current GHG Concentrations**).

Table 4.2-5
Comparison of Global Pre-Industrial and Current GHG Concentrations[1]

Greenhouse Gas	Early Industrial Period Concentrations (ppm)	Natural Range for Last 650,000 Years (ppm)	2005 Concentrations (ppm)
Carbon Dioxide	280	180-300	379
Methane	715	320-790	1774
Nitrous Oxide	270	N/A	319

Sources:
[1] *Intergovernmental Panel on Climate Change, Climate Change 2007: The Physical Science Basis, Summary for Policymakers, (2007).*

Effects of Global Climate Change

The primary effect of global climate change has been a rise in the average global tropospheric temperature of 0.2° Celsius per decade, determined from meteorological measurements worldwide between 1990 and 2005.[26] Climate change modeling using 2000 emission rates shows that further

24 Ibid.
25 Ibid.
26 Ibid.

warming is likely to occur, which would induce further changes in the global climate system during the current century.[27] Changes to the global climate system and ecosystems and to California could include:

- declining sea ice and mountain snowpack levels, thereby increasing sea levels and sea surface evaporation rates with a corresponding increase in tropospheric water vapor due to the atmosphere's ability to hold more water vapor at higher temperatures;[28]
- rising average global sea levels primarily due to thermal expansion and the melting of glaciers, ice caps, and the Greenland and Antarctic ice sheets;[29]
- changing weather patterns, including changes to precipitation, ocean salinity, and wind patterns, and more energetic aspects of extreme weather including droughts, heavy precipitation, heat waves, extreme cold, and the intensity of tropical cyclones;[30]
- declining Sierra snowpack levels, which account for approximately half of the surface water storage in California, by 70 percent to as much as 90 percent over the next 100 years;[31]
- increasing the number of days conducive to ozone formation by 25 to 85 percent (depending on the future temperature scenario) in high ozone areas located in the Southern California area and the San Joaquin Valley by the end of the 21st century;[32]
- increasing the potential for erosion of California's coastlines and sea water intrusion into the Sacramento and San Joaquin Delta and associated levee systems due to the rise in sea level;[33]
- Increasing pest infestation making California more susceptible to forest fires;[34] and
- Increasing the demand for electricity by 1 to 3 percent by 2020 due to rising temperatures resulting in hundreds of millions of dollars in extra expenditures.[35]

In 2009, the California Natural Resources Agency (CNRA) published the *California Climate Adaptation Strategy*[36] as a response to the Governor's Executive Order S-13-2008. The CNRA report lists specific recommendations for state and local agencies to best adapt to the anticipated risks posed by a changing

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27 Ibid.

28 Ibid.

29 Ibid.

30 Ibid.

31 California Environmental Protection Agency, Climate Action Team, *Climate Action Team Report to Governor Schwarzenegger and the Legislature*, (2006).

32 Ibid.

33 Ibid.

34 Ibid.

35 Ibid.

36 California Natural Resources Agency, Climate Action Team, *2009 California Climate Adaptation Strategy: A Report to the Governor of the State of California in Response to Executive Order S-13-2008*, (2009).

climate. The key preliminary recommendations for adapting to a changing climate are based on sector specific and cross-sector adaptation strategies identified in the CNRA report. The sectors consist of Public Health, Biodiversity and Habitat, Ocean and Coastal Resources, Water Management, Agriculture, Forestry, Transportation and Energy Infrastructure, and Cross-Sector.

REGULATORY FRAMEWORK

Air Quality

Federal

The U.S. EPA is responsible for enforcing the federal Clean Air Act and the NAAQS. The U.S. EPA regulated emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain locomotives. The U.S. EPA also maintains jurisdiction over emissions sources outside state waters (outer continental shelf), and establishes various emissions standards for vehicles sold in states other than California. These standards identify levels of air quality for seven criteria pollutants: O_3, CO, NO_2, SO_2, PM10, PM2.5, and lead. The thresholds are considered to be the maximum concentration of ambient (background) air pollutants determined safe to protect the public health and welfare with an adequate margin of safety.

As part of its enforcement responsibilities, the U.S. EPA requires each state with areas that do not meet the federal standards to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain the federal standards. The SIP must integrate federal, state, and local plan components and regulations to identify specific measures to reduce pollution, using a combination of performance standards and market-based programs within the time frame identified in the SIP. The SCAQMD *2007 Air Quality Management Plan* (AQMP) is the regulatory mechanisms by which the SoCAB conforms to U.S. EPA regulations.

The 1990 Clean Air Act Amendments were enacted to better protect the public's health and create more efficient methods to lowering pollutant emissions. The major areas of improvement addressed in the amendments include NAAQS, air basin designations, automobile/heavy-duty engine emissions, and hazardous air pollutants. The U.S. EPA designated air basins as being in attainment or nonattainment for each of the seven criteria pollutants. Nonattainment air basins for ozone are further ranked (marginal, moderate, serious, severe, or extreme) according to the degree of nonattainment. CARB is required to describe in its SIP how the state will achieve federal standards by specified dates for each air basin that has failed to attain a NAAQS for any criteria pollutant. The SCAQMD has developed the *2007 AQMP*, which demonstrated how the region will attain the air quality standards set for in the Clean Air Act Amendments. The extent of a given SIP depends on the severity of the air quality condition within the

state or a specific air basin. The SoCAB is classified by the U.S. EPA as an extreme nonattainment area with for O_3, standard and as attainment/unclassified for the other criteria pollutants. The status of Los Angeles County with respect to attainment with the NAAQS is summarized in **Table 4.2-6, National Ambient Air Quality Standard Designations – South Coast Air Basin (Los Angeles County),** below.

Table 4.2-6
National Ambient Air Quality Standard Designations
South Coast Air Basin (Los Angeles County)

Pollutant	Designation/Classification
Ozone (O_3)	Nonattainment/Extreme
Carbon Monoxide (CO)	Attainment/Maintenance
Nitrogen Dioxide (NO_2)	Attainment/Maintenance
Sulfur Dioxide (SO_2)	Attainment
Respirable Particulate Matter (PM10)	Nonattainment/Serious
Fine Particulate Matter (PM2.5)	Nonattainment
Lead (Pb)	Attainment

Source: U.S. Environmental Protection Agency, "Region 9: Air Programs, Air Quality Maps," http://www.epa.gov/region9/air/maps/maps_top.html. 2010.

In response to rapid population growth and the associated rise in motor vehicle operations, the 1990 Clean Air Act Amendments addressed tailpipe emissions from automobiles, heavy-duty engines, and diesel fuel engines. The amendments established more stringent standards for hydrocarbons, NO_X, and CO emissions in order to reduce the ozone and carbon monoxide levels in heavily populated areas. Under the 1990 Clean Air Act, new fuels were required to be less volatile, contain less sulfur (regarding diesel fuel), and have higher levels of oxygenates (oxygen-containing substances to improve fuel combustion). The U.S. EPA also has regulatory and enforcement jurisdiction over emission sources beyond state waters (outer continental shelf), and those that are under the exclusive authority of the federal government, such as aircraft, locomotives, and interstate trucking. Due to the lack of a substantial reduction in hazardous emissions under the 1977 Clean Air Act, the 1990 Clean Air Act Amendments listed 189 hazardous air pollutants (HAPs), which are carcinogenic, mutagenic, and/or reproductive toxicants, to be reduced. The 1990 Clean Air Act Amendments impacts major stationary sources and area emissions sources requiring use of Maximum Achievable Control Technology (MACT) to reduce HAP emissions and their associated health impacts.

State

CARB oversees air quality planning and control throughout California. It is primarily responsible for ensuring the implementation of the California Clean Air Act, responding to the federal Clean Air Act planning requirements applicable to the state, and regulating emissions from motor vehicles and consumer products within the state. In addition, CARB also sets health based air quality standards and control measures for toxic air contaminants (TACs). Much of CARB's research goes toward automobile emissions, as they are primary contributors to air pollution in California. Under the Clean Air Act, CARB has the authority to establish more stringent standards for vehicles sold in California and for various types of equipment available commercially. It also sets fuel specifications to further reduce vehicular emissions.

The California Clean Air Act established a legal mandate for air basins to achieve the California ambient air quality standards (CAAQS) by the earliest practical date. These standards apply to the same seven criteria pollutants as the federal Clean Air Act and also include sulfates, visibility-reducing particles, hydrogen sulfide, and vinyl chloride. The State standards are more stringent than the federal standards, and in the case of PM10 and SO_2, far more stringent.

CARB supervises and supports the regulatory activities of local air quality districts as well as monitors air quality itself. Health and Safety Code Section 39607(e) requires CARB to establish and periodically review area designation criteria. These designation criteria provide the basis for CARB to designate areas of the state as attainment, nonattainment, or unclassified according to state standards. CARB makes area designations for 10 criteria pollutants: O_3, CO, NO_2, SO_2, PM10, PM2.5, sulfates, lead, hydrogen sulfide, and visibility-reducing particles.[37] Air quality of a region is considered to be in attainment of the state standards if the measured ambient air pollutant levels for O_3, CO, NO_2, PM10, PM2.5, SO_2 (1- and 24-hour), and lead are not exceeded, and all other standards are not equaled or exceeded at any time in any consecutive three-year period. The status of Los Angeles County with respect to attainment with the CAAQS is summarized in **Table 4.2-7, California Ambient Air Quality Standard Designations – South Coast Air Basin (Los Angeles County),** below.

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37 California Air Resources Board, "Area Designations (Activities and Maps)," http://www.arb.ca.gov/desig/desig.htm. 2010. According to California Health and Safety Code, Section 39608, "state board, in consultation with the districts, shall identify, pursuant to subdivision (e) of Section 39607, and classify each air basin which is in attainment and each air basin which is in nonattainment for any state ambient air quality standard." Section 39607(e) states that the State shall "establish and periodically review criteria for designating an air basin attainment or nonattainment for any state ambient air quality standard set forth in Section 70200 of Title 17 of the California Code of Regulations. California Code of Regulations, Title 17, Section 70200 does not include vinyl chloride; therefore, CARB does not make area designations for vinyl chloride.

Table 4.2-7
California Ambient Air Quality Standard Designations
South Coast Air Basin (Los Angeles County)

Pollutant	Designation/Classification
Ozone (O_3)	Nonattainment[1]
Carbon Monoxide (CO)	Attainment
Nitrogen Dioxide (NO_2)	Attainment
Sulfur Dioxide (SO_2)	Attainment
Respirable Particulate Matter (PM10)	Nonattainment
Fine Particulate Matter (PM2.5)	Nonattainment
Lead (Pb)	Attainment
Sulfates (SO_4)	Attainment
Hydrogen Sulfide (H_2S)	Unclassified
Vinyl Chloride	Unclassified
Visibility-Reducing Particles	Unclassified

Source:
California Air Resources Board, "Area Designations Maps/State and National," http://www.arb.ca.gov /desig/adm/adm.htm. 2010.
[1] *CARB has not issued area classifications based on the new state 8-hour standard. The previous classification for the 1-hour ozone standard was Severe.*

Regional

South Coast Air Quality Management District

The management of air quality in the SoCAB is the responsibility of the SCAQMD. This responsibility was given to SCAQMD by the state legislature's adoption of the 1977 Lewis-Presley Air Quality Management Act, which merged four county air pollution control bodies into one regional district. Under the Lewis-Presley Air Quality Act, the SCAQMD is responsible for bringing air quality in the areas under its jurisdiction into conformity with federal and state air quality standards. Specifically, the SCAQMD is responsible for monitoring ambient air pollutant levels throughout the Basin and for developing and implementing attainment strategies to ensure that future emissions will be within federal and state standards.

The SCAQMD primarily regulates emissions from stationary sources such as manufacturing and power generation. Mobile sources such as buses, automotive vehicles, trains, and airplanes are largely out of the SCAQMD's jurisdiction and are up to CARB and the U.S. EPA to regulate. In order to achieve air quality standards, the SCAQMD adopts an Air Quality Management Plan that serves as a guideline to bring

pollutant concentrations into attainment with federal and state standards. The SCAQMD determines if certain rules and control measures are appropriate for their specific region according to technical feasibility, cost effectiveness, and the severity of nonattainment. Once the SCAQMD has adopted the proper rules, control measures, and permit programs, it is responsible for implementing and enforcing compliance with those rules, control measures, and programs.

SCAQMD Air Quality Analysis Guidance Handbook

In 1993, the SCAQMD prepared its *CEQA Air Quality Handbook* to assist local government agencies and consultants in preparing environmental documents for projects subject to CEQA.[38] The SCAQMD is in the process of developing an *Air Quality Analysis Guidance Handbook* to replace the *CEQA Air Quality Handbook*. The documents describe the criteria that SCAQMD uses when reviewing and commenting on the adequacy of environmental documents. The handbook recommends thresholds of significance in order to determine if a project will have a significant adverse environmental impact. Other important contents are methodologies for predicting project emissions and mitigation measures that can be taken to avoid or reduce air quality impacts. Although the Governing Board of the SCAQMD has adopted the *CEQA Air Quality Handbook*, and is in the process of developing a replacement document, it does not, nor does it intend to, supersede a local jurisdiction's CEQA procedures.[39]

While the *Air Quality Analysis Guidance Handbook* is being developed, supplemental information has been adopted by the SCAQMD. These include revisions to the air quality significance thresholds and a new procedure referred to as "localized significance thresholds," which has been added as a significance threshold under the *Final Localized Significance Threshold Methodology*.[40] The SCAQMD has recommended that lead agencies not use the screening tables in the *CEQA Air Quality Handbook's* Chapter 6 because the tables were derived using an obsolete version of CARB's mobile source emission factor inventory and are also based on outdated trip generation rates from a prior edition of the Institute of Transportation Engineer's Trip Generation Handbook.[41] The SCAQMD has also recommended that lead agencies not use the on-road mobile source emission factors in Table A9-5-J1 through A9-5-L as they are obsolete, and instead recommends using on-road mobile source emission factors approved by the CARB.[42] The

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38 South Coast Air Quality Management District, "Air Quality Analysis Guidance Handbook," http://www.aqmd.gov/CEQA/hdbk.html. 2009.

39 South Coast Air Quality Management District, "Frequently Asked CEQA Questions," http://www.aqmd.gov/ceqa/faq.html. 2007.

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

41 South Coast Air Quality Management District, "CEQA Air Quality Handbook," (1993), http://www.aqmd.gov/ceqa/oldhdbk.html. 2007.

42 South Coast Air Quality Management District, "EMFAC 2007 (v2.3) Emission Factors (On-Road)," http://www.aqmd.gov/CEQA/handbook/onroad/onroad.html. 2008.

outdated and obsolete information were not used in this analysis. The applicable portions of the *CEQA Air Quality Handbook*, the *Air Quality Analysis Guidance Handbook* supplemental information, and other revised methodologies were used in preparing the air quality analysis in this section.

SCAQMD Air Quality Management Plan

The SCAQMD is required to produce Air Quality Management Plans describing how air quality will be improved. The California Clean Air Act requires that these plans be updated triennially in order to incorporate the most recent available technical information. In addition, the U.S. EPA requires that transportation conformity budgets be established based on the most recent planning assumptions (i.e., within the last five years). Plan updates are necessary to ensure continued progress toward attainment of the NAAQS and to avoid a transportation conformity lapse and associated federal funding losses. A multi-level partnership of governmental agencies at the federal, state, regional, and local levels implement the programs contained in these plans. Agencies involved include the U.S. EPA, CARB, local governments, Southern California Association of Governments (SCAG), and the SCAQMD.

The SCAQMD is the agency responsible for preparing the AQMP for the SoCAB. Since 1979, a number of AQMPs have been prepared. The SCAQMD adopted the currently applicable *2007 AQMP* on June 1, 2007. CARB approved the *2007 AQMP* as the comprehensive State Implementation Plan component for the SoCAB on September 27, 2007. The purpose of the *2007 AQMP* for the SoCAB (and those portions of the Salton Sea Air Basin under the SCAQMD's jurisdiction) is to set forth a comprehensive program that will lead these areas into compliance with federal and state air quality planning requirements for ozone and PM2.5. In addition, as part of the *2007 AQMP*, the SCAQMD requested U.S. EPA's approval of a "bump-up" to the "extreme" nonattainment classification of ozone for the SoCAB. The extreme nonattainment classification would extend the ozone attainment date from 2021 to 2024 and allow for the attainment demonstration to rely on emission reductions from measures that anticipate the development of new technologies or improvement of existing control technologies. The U.S. EPA approved the extreme nonattainment request on April 15, 2010.

The *2007 AQMP* focuses on attainment strategies for the ozone and PM2.5 standards through stricter control of sulfur oxides and directly emitted PM2.5, NO_x, and VOCs. Although PM2.5 plans for nonattainment areas were due in April 2008, the SCAQMD has integrated PM2.5 and ozone reduction control measures and strategies in the *2007 AQMP*. The need to commence PM2.5 control strategies before April 2008 was due to the attainment date for PM2.5 (2015) being much earlier than that for ozone (2024 for the extreme designation). Control measures and strategies for PM2.5 will also help control ozone generation in the region because PM2.5 and ozone share similar precursors (e.g., NO_x). In addition, the AQMP focuses on reducing VOC emissions, which have not been reduced at the same rate as NO_x

emissions in the past. Hence, the SoCAB has not achieved the reductions in ozone as were expected in previous plans.

SCAQMD Rules and Regulations

The SCAQMD is responsible for limiting the amount of emissions that can be generated throughout the South Coast Air Basin by various stationary, area, and mobile sources. Specific rules and regulations have been adopted by the SCAQMD Governing Board, which limit the emissions that can be generated by various uses/activities and that identify specific pollution reduction measures which must be implemented in association with various uses and activities. These rules not only regulate the emissions of the federal and state criteria pollutants but also toxic air contaminants and acutely hazardous materials. The rules are also subject to ongoing refinement by SCAQMD.

Among the SCAQMD rules applicable to the Proposed Project are Rule 403 (Fugitive Dust), Rule 1113 (Architectural Coatings), and Rule 1403 (Asbestos Emissions from Demolition/Renovation Activities). Rule 403 requires the use of stringent best available control measures to minimize PM10 emissions during grading and construction activities. Rule 1113 requires reductions in the VOC content of coatings, with a substantial reduction in the VOC content limit for flat coatings in July 2008. Compliance with SCAQMD Rule 1403 requires that the owner or operator of any demolition or renovation activity have an asbestos survey performed prior to demolition and provide notification to the SCAQMD prior to commencing demolition activities. Additional details regarding these rules and other potentially applicable rules are presented below.

- **Rule 403 (Fugitive Dust)** – This rule requires fugitive dust sources to implement Best Available Control Measures for all sources, and all forms of visible particulate matter are prohibited from crossing any property line. SCAQMD Rule 403 is intended to reduce PM10 emissions from any transportation, handling, construction, or storage activity that has the potential to generate fugitive dust (see also Rule 1186).

- **Rule 1113 (Architectural Coatings)** – This rule requires manufacturers, distributors, and end-users of architectural and industrial maintenance coatings to reduce VOC emissions from the use of these coatings, primarily by placing limits on the VOC content of various coating categories.

- **Rule 1121 (Control of Nitrogen Oxides from Residential Type, Natural Gas-Fired Water Heaters)** - This rule prescribes NO_X emission limits for natural gas-fired water heaters with heat input rates less than 75,000 Btu per hour. It applies to manufacturers, distributors, retailers, and installers of natural gas-fired water heaters. In lieu of meeting these NO_X limits, this rule allows emission mitigation fees to be collected from water heater manufacturers to fund stationary and mobile source emission reduction projects targeted at offsetting NO_X emissions from water heaters that do not meet Rule 1121 emission standards.

- **Rule 1146.2 (Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters)** – This rule requires manufacturers, distributors, retailers, refurbishers, installers, and operators of new and existing units to reduce NO_x emissions from natural gas-fired water heaters, boilers, and process heaters as defined in this rule.

- **Rule 1186 (PM10 Emissions from Paved and Unpaved Roads, and Livestock Operations)** – This rule applies to owners and operators of paved and unpaved roads and livestock operations. The rule is intended to reduce PM10 emissions by requiring the clean-up of material deposited onto paved roads, use of certified street sweeping equipment, and treatment of high-use unpaved roads (see also Rule 403).

- **Rule 1403 (Asbestos Emissions from Demolition/Renovation Activities)** – This rule requires owners and operators of any demolition or renovation activity and the associated disturbance of asbestos-containing materials, any asbestos storage facility, or any active waste disposal site to implement work practice requirements to limit asbestos emissions from building demolition and renovation activities, including the removal and associated disturbance of asbestos-containing materials.

Stationary emissions sources subject to these rules are regulated through SCAQMD's permitting process. Through this permitting process, SCAQMD also monitors the amount of stationary emissions being generated and uses this information in developing AQMPs. The Proposed Project would be subject to SCAQMD rules and regulations to reduce specific emissions and to mitigate potential air quality impacts.

Southern California Association of Governments

SCAG is a council of governments for the Counties of Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura. As a regional planning agency, SCAG serves as a forum for regional issues relating to transportation, the economy, community development, and the environment. SCAG also serves as the regional clearinghouse for projects requiring environmental documentation under federal and state law. In this role, SCAG reviews projects to analyze their impacts on SCAG's regional planning efforts.

Although SCAG is not an air quality management agency, it is responsible for several air quality planning issues. Specifically, as the designated Metropolitan Planning Organization for the Southern California region, it is responsible, pursuant to Section 176(c) of the 1990 amendments to the Clean Air Act, for providing current population, employment, travel, and congestion projections for regional air quality planning efforts. With respect to air quality, SCAG has prepared the *2004 Regional Transportation Plan*[43] and the *2006 Regional Transportation Improvement Program*[44] for the SCAG region, which form the

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43 Southern California Association of Governments, "Regional Transportation Plan," http://www.scag.ca.gov /rtp2004/2004/FinalPlan.htm. 2004.

44 Southern California Association of Governments, "Regional Transportation Improvement Program," http://www.scag.ca.gov/RTIP/rtip2006/adopted.htm. 2006.

basis for the transportation components of the AQMP and are utilized in the preparation of air quality forecasts and the consistency analysis that is included in the AQMP.

Local

Local governments have the authority and responsibility to reduce air pollution through their police power and land use decision-making authority. Specifically, local governments are responsible for the mitigation of emissions resulting from land use decisions and for the implementation of transportation control measures as outlined in the AQMP. The AQMP assigns local governments certain responsibilities to assist the Basin in meeting air quality goals and policies. In general, a first step toward implementation of a local government's responsibility is accomplished by identifying air quality goals, policies and implementation measures in its general plan, such as the Air Quality section in the City of Glendale General Plan. Through capital improvement programs, local governments can fund infrastructure that contributes to improved air quality, by requiring such improvements as bus turnouts, energy-efficient streetlights and synchronized traffic signals. In accordance with the CEQA requirements and the CEQA review process, local governments assess air quality impacts, require mitigation of potential air quality impacts by conditioning discretionary permits, and monitor and enforce implementation of such mitigation.

Global Climate Change

Federal

In *Massachusetts v. EPA,* the Supreme Court held that U.S. EPA has the statutory authority under Section 202 of the CAA to regulate GHGs from new motor vehicles. The Court did not hold that the U.S. EPA was required to regulate greenhouse gas (GHG) emissions; however, it indicated that the agency must decide whether GHGs from motor vehicles cause or contribute to air pollution that is reasonably anticipated to endanger public health or welfare. Upon the final decision, the President signed Executive Order 13432 on May 14, 2007, directing the U.S. EPA, along with the Departments of Transportation, Energy, and Agriculture, to initiate a regulatory process that responds to the Supreme Court's decision.

In December 2007, the President signed the Energy Independence and Security Act of 2007, which sets a mandatory Renewable Fuel Standard requiring fuel producers to use at least 36 billion gallons of biofuel in 2022 and sets a national fuel economy standard of 35 miles per gallon by 2020. The Act also contains provisions for energy efficiency in lighting and appliances and for the implementation of green building technologies in federal buildings.

On July 11, 2008, the U.S. EPA issued an Advance Notice of Proposed Rulemaking on regulating GHGs under the CAA. The Advance Notice of Proposed Rulemaking reviews the various CAA provisions that may be applicable to the regulation of GHGs and presents potential regulatory approaches and technologies for reducing GHG emissions. In the Advance Notice of Proposed Rulemaking, the U.S. EPA seeks further public comment on the regulation of GHG emissions under the CAA.[45]

The U.S. EPA adopted a mandatory GHG reporting rule in September 2009. The rule would requires suppliers of fossil fuels or industrial greenhouse gases, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions submit annual reports to the U.S. EPA beginning in 2011 (covering the 2010 calendar year emission). Vehicle and engine manufacturers would begin reporting GHG emissions for model year 2011.

On September 15, 2009, the U.S. EPA and the Department of Transportation's (DOT) National Highway Traffic Safety Administration (NHTSA) issued a joint proposal to establish a national program consisting of new standards for model year 2012 through 2016 light-duty vehicles that will reduce GHG emissions and improve fuel economy. The proposed standards would be phased in and would require passenger cars and light-duty trucks to comply with a declining emission standard. In 2012, passenger cars and light-duty trucks would have to meet an average emission standard of 295 grams of CO_2 per mile and 30.1 miles per gallon.[46] By 2016, the vehicles would have to meet a standard of 250 grams of CO_2 per mile and 35.5 miles per gallon.[47]

On December 7, 2009, the U.S. EPA Administrator signed two distinct findings regarding GHGs under section 202(a) of the Clean Air Act:

- **Endangerment Finding:** The Administrator finds that the current and projected concentrations of the six key well-mixed GHGs (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride) in the atmosphere threaten the public health and welfare of current and future generations.

- **Cause or Contribute Finding:** The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.

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45 U.S. Environmental Protection Agency, "Advance Notice of Proposed Rulemaking: Regulating Greenhouse Gas Emissions under the Clean Air Act," http://www.epa.gov/climatechange/anpr.html. 2008.

46 U.S. Environmental Protection Agency, "EPA and NHTSA Propose Historic National Program to Reduce Greenhouse Gases and Improve Fuel Economy for Cars and Trucks," http://epa.gov/otaq/climate /regulations/420f09047a.htm. 2009.

47 Ibid.

While these findings do not impose any requirements on industry or other entities, this action is a prerequisite to finalizing the U.S. EPA's proposed greenhouse gas emission standards for light-duty vehicles, which were jointly proposed by the U.S. EPA and the NHSTA. On April 1, 2012, the U.S. EPA and NHTSA issued final rules requiring that by the 2016 model-year, manufacturers must achieve a combined average vehicle emission level of 250 grams of CO_2 per mile, which is equivalent to 35.5 miles per gallon as measured by U.S. EPA standards.

State

Title 24 Building Standards Code

The CEC first adopted Energy Efficiency Standards for Residential and Nonresidential Buildings (California Code of Regulations, Title 24, Part 6) in 1978 in response to a legislative mandate to reduce energy consumption in the state. Although not originally intended to reduce GHG emissions, increased energy efficiency, and reduced consumption of electricity, natural gas, and other fuels would result in fewer GHG emissions from residential and nonresidential buildings subject to the standard. The standards are updated periodically to allow for the consideration and inclusion of new energy efficiency technologies and methods. The latest revisions were adopted in 2008 and became effective on January 1, 2010.

Part 11 of the Title 24 Building Standards Code is referred to as the California Green Building Standards Code (CALGreen Code). The purpose of the CALGreen Code is to "improve public health, safety and general welfare by enhancing the design and construction of buildings through the use of building concepts having a positive environmental impact and encouraging sustainable construction practices in the following categories: (1) Planning and design, (2) Energy efficiency, (3) Water efficiency and conservation, (4) Material conservation and resource efficiency, and (5) Environmental air quality."[48] The CALGreen Code is not intended to substitute or be identified as meeting the certification requirements of any green building program that is not established and adopted by the California Building Standards Commission (CBSC). The CBSC has released a *2010 Draft California Green Building Standards Code* on its website.[49] It is anticipated the this update to Part 11 of the Title 24 Building Standards Code will be effective on January 1, 2011. Unless otherwise noted in the regulation, all newly constructed buildings in California are subject of the requirements of the CALGreen Code.

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48 California Building Standards Commission, 2008 California Green Building Standards Code, (2009) 3.

49 California Building Standards Commission, "CALGreen," http://www.bsc.ca.gov/CALGreen/default.htm. 2010.

Assembly Bill 1493

In response to the transportation sector's contribution of more than half of California's CO_2 emissions, Assembly Bill 1493 (AB 1493, Pavley) was enacted on July 22, 2002. AB 1493 requires CARB to set GHG emission standards for passenger vehicles, light-duty trucks, and other vehicles whose primary use is noncommercial personal transportation. The bill requires CARB to set the GHG emission standards for motor vehicles manufactured in 2009 and all subsequent model years. In setting these standards, CARB is required to consider cost-effectiveness, technological feasibility, economic impacts, and provide maximum flexibility to manufacturers. CARB adopted the statutorily mandated standards in September 2004. If fully phased in, the near-term (2009–2012) standards would result in about a 22 percent reduction in greenhouse gas emissions compared to the emissions from the 2002 fleet, while the mid-term (2013–2016) standards would result in a reduction of about 30 percent.

In December 2004, these regulations were challenged in federal court by the Alliance of Automobile Manufacturers, who claimed that the law regulated vehicle fuel economy, a duty assigned to the federal government. In December 2007, after the U.S. Supreme Court's decision in *Massachusetts v. EPA*, the U.S. District Court for the Eastern District dismissed the case against the AB 1493 regulations by the Alliance of Automobile Manufacturers.

However, before these regulations may go into effect, the U.S. EPA must grant California a waiver under the federal CAA, which ordinarily preempts state regulation of motor vehicle emission standards. On June 30, 2009, the U.S. EPA formally approved California's waiver request. However, in light of the September 15, 2009 announcement by the U.S. EPA and NHTSA regarding the national program to reduce vehicle GHG emissions, California—and states adopting California emissions standards—have agreed to defer to the proposed national standard through model year 2016 if granted a waiver by the U.S. EPA. The 2016 endpoint of the two standards is similar, although the national standard ramps up slightly more slowly than required under the California standard. The Pavley standards require additional reductions in CO_2 emissions beyond 2016 (referred to as Phase II standards). Nonetheless, California and other states adopting the California standards will not toughen standards beyond the proposed national standard until at least the 2017 model year.

Executive Order S-3-05 and the Climate Action Team

In June 2005, the Governor established California's GHG emissions reduction targets in Executive Order S-3-05. The Executive Order established the following goals: GHG emissions should be reduced to 2000 levels by 2010, 1990 levels by 2020, and 80 percent below 1990 levels by 2050. The Secretary of California Environmental Protection Agency (CalEPA) is required to coordinate efforts of various agencies in order

to collectively and efficiently reduce GHGs. Some of the agency representatives involved in the GHG reduction plan include the Secretary of the Business, Transportation and Housing Agency, the Secretary of the Department of Food and Agriculture, the Secretary of the Resources Agency, the Chairperson of CARB, the Chairperson of the CEC, and the President of the Public Utilities Commission. Representatives from these agencies comprise the Climate Action Team.

Climate Action Team

The Climate Action Team is responsible for implementing global warming emissions reduction programs. The CalEPA secretary is required to submit a biannual progress report from the Climate Action Team to the governor and state legislature disclosing the progress made toward GHG emission reduction targets and the impacts of global warming on California's water supply, public health, agriculture, the coastline, and forestry, and reporting possible mitigation and adaptation plans to combat these impacts.

Climate Action Team Report

The 2009 Climate Action Team Report (2009 CAT Report) identifies key measures that will help ensure that California will meet the GHG reduction goals established under the Governor's Executive Order S-3-05 (1990 levels by 2020 and 80 percent below 1990 levels by 2050). These key measures include both mitigation and adaptation strategies for all sectors of the economy.

Some strategies currently being implemented by state agencies include CARB introducing vehicle climate change standards and diesel anti-idling measures, the Energy Commission implementing building and appliance efficiency standards, and the CalEPA implementing its green building initiative. The Climate Action Team also recommends future emission reduction strategies, such as using only low-GWP refrigerants in new vehicles, developing ethanol as an alternative fuel, reforestation, solar power initiatives for homes and businesses, and investor-owned utility energy efficiency programs. According to the report, implementation of current and future emission reduction strategies have the potential to achieve the goals set forth in Executive Order S-3-05.

Assembly Bill 32

In furtherance of the goals established in Executive Order S-3-05, the Legislature enacted Assembly Bill 32 (AB 32, Nuñez and Pavley), the California Global Warming Solutions Act of 2006, which Governor Schwarzenegger signed on September 27, 2006. AB 32 represents the first enforceable statewide program to limit GHG emissions from all major industries with penalties for noncompliance. AB 32 requires the state to undertake several actions – the major requirements are discussed below:

CARB Early Action Measures

CARB is responsible for carrying out and developing the programs and requirements necessary to achieve the goals of AB 32—the reduction of California's GHG emissions to 1990 levels by 2020. The first action under AB 32 resulted in CARB's adoption of three (3) early action greenhouse gas emission reduction measures on June 21, 2007. On October 25, 2007, CARB approved an additional six early-action GHG reduction measures under AB 32. CARB has adopted regulations for all early action measures. The early action measures are divided into three categories:

- Group 1 - GHG rules for immediate adoption and implementation
- Group 2 - Several additional GHG measures under development
- Group 3 - Air pollution controls with potential climate co-benefits

The original three adopted early-action regulations meeting the narrow legal definition of "discrete early action GHG reduction measures" include:

- a low-carbon fuel standard to reduce the "carbon intensity" of California fuels;
- the reduction of refrigerant losses from motor vehicle air conditioning system maintenance to restrict the sale of "do-it-yourself" automotive refrigerants; and
- increased methane capture from landfills to require broader use of state-of-the-art methane capture technologies.

The additional six early-action regulations adopted on October 25, 2007, also meeting the narrow legal definition of "discrete early action GHG reduction measures," include:

- the reduction of aerodynamic drag, and thereby fuel consumption, from existing trucks and trailers through retrofit technology;
- the reduction of auxiliary engine emissions of docked ships by requiring port electrification;
- the reduction of perfluorocarbons from the semiconductor industry;
- the reduction of propellants in consumer products (*e.g.*, aerosols, tire inflators, and dust removal products);
- the requirement that all tune-up, smog check and oil change mechanics ensure proper tire inflation as part of overall service in order to maintain fuel efficiency; and
- the restriction on the use of sulfur hexafluoride from non-electricity sectors if viable alternatives are available.

State of California 1990 Greenhouse Gas Inventory and 2020 Limit

As required under AB 32, on December 6, 2007, CARB approved the 1990 greenhouse gas emissions inventory, thereby establishing the emissions limit for 2020. The 2020 emissions limit was set at 427 $MMTCO_2e$. CARB also projected the state's 2020 GHG emissions under "business as usual" (BAU) conditions—that is, emissions that would occur without any plans, policies, or regulations to reduce GHG emissions. CARB used an average of the state's GHG emissions from 2002 through 2004 and projected the 2020 levels based on population and economic forecasts. The projected net emissions totaled approximately 596 $MMTCO_2e$. Therefore, the state must reduce its 2020 BAU emissions by approximately 29 percent in order to meet the 1990 target.

The inventory revealed that in 1990, transportation, with 35 percent of the state's total emissions, was the largest single sector, followed by industrial emissions, 24 percent; imported electricity, 14 percent; in-state electricity generation, 11 percent; residential use, 7 percent; agriculture, 5 percent; and commercial uses, 3 percent. AB 32 does not require individual sectors to meet their individual 1990 GHG emissions inventory; the total statewide emissions are required to meet the 1990 threshold by 2020.

CARB Mandatory Reporting Requirements

In addition to the 1990 emissions inventory, CARB also adopted regulations requiring the mandatory reporting of GHG emissions for large facilities on December 6, 2007. The mandatory reporting regulations require annual reporting from the largest facilities in the state, which account for approximately 94 percent of GHG emissions from industrial and commercial stationary sources in California. About 800 separate sources fall under the new reporting rules and include electricity generating facilities, electricity retail providers and power marketers, oil refineries, hydrogen plants, cement plants, cogeneration facilities, and industrial sources that emit over 25,000 tons of carbon dioxide each year from on-site stationary combustion sources. Transportation sources, which account for 38 percent of California's total greenhouse gas emissions, are not covered by these regulations but will continue to be tracked through existing means. Affected facilities will begin tracking their emissions in 2008, to be reported beginning in 2009 with a phase-in process to allow facilities to develop reporting systems and train personnel in data collection. Emissions for 2008 may be based on best available emission data. Beginning in 2010, however, emissions reporting requirements will be more rigorous and will be subject to third-party verification. Verification will take place annually or every three years, depending on the type of facility.

AB 32 Climate Change Scoping Plan

As indicated above, AB 32 requires CARB to adopt a scoping plan indicating how reductions in significant GHG sources will be achieved through regulations, market mechanisms, and other actions.

After receiving public input on their discussion draft of the Proposed Scoping Plan released in June 2008, CARB released the Climate Change Proposed Scoping Plan in October 2008 that contains an outline of the proposed state strategies to achieve the 2020 greenhouse gas emission limits. The CARB Governing Board approved the Scoping Plan on December 11, 2008. Key elements of the Scoping Plan include the following recommendations:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards.
- Achieving a statewide renewable energy mix of 33 percent.
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system.
- Establishing targets for transportation-related greenhouse gas emissions for regions throughout California and pursuing policies and incentives to achieve those targets.
- Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard.
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the state's long-term commitment to AB 32 implementation.

Under the Scoping Plan, approximately 85 percent of the state's emissions are subject to a cap-and-trade program where covered sectors are placed under a declining emissions cap. The emissions cap incorporates a margin of safety whereas the 2020 emissions limit will still be achieved even in the event that uncapped sectors do not fully meet their anticipated emission reductions. Emissions reductions will be achieved through regulatory requirements and the option to reduce emissions further or purchase allowances to cover compliance obligations. It is expected that emission reduction from this cap-and-trade program will account for a large portion of the reductions required by AB 32.

Table 4.2-8, AB 32 Scoping Plan Measures, lists CARB's preliminary recommendations for achieving greenhouse gas reductions under AB 32 along with a brief description of the requirements and applicability.

Table 4.2-8
AB 32 Scoping Plan Measures

Scoping Plan Measure	Description
SPM-1: California Cap-and-Trade Program linked to Western Climate Initiative	Implement a broad-based cap-and-trade program that links with other Western Climate Initiative Partner programs to create a regional market system. Ensure California's program meets all applicable AB 32 requirements for market-based mechanisms. Capped sectors include transportation, electricity, natural gas, and industry. Projected 2020 business-as-usual emissions are estimated at 512 $MTCO_2e$; preliminary 2020 emissions limit under cap-and-trade program are estimated at 365 $MTCO_2e$ (29 percent reduction).
SPM-2: California Light-Duty Vehicle GHG Standards	Implement adopted Pavley standards and planned second phase of the program. AB 32 states that if the Pavley standards (AB 1493) do not remain in effect, CARB shall implement equivalent or greater alternative regulations to control mobile sources.
SPM-3: Energy Efficiency	Maximize energy efficiency building and appliance standards, and pursue additional efficiency efforts. The Proposed Scoping Plan considers green building standards as a framework to achieve reductions in other sectors, such as electricity.
SPM-4: Renewables Portfolio Standard	Achieve 33 percent Renewable Portfolio Standard by both investor-owned and publicly owned utilities.
SPM-5: Low Carbon Fuel Standard	CARB identified the Low Carbon Fuel Standard as a Discrete Early Action item and the final regulation was adopted on April 23, 2009. In January 2007, Governor Schwarzenegger issued Executive Order S-1-07, which called the reduction of the carbon intensity of California's transportation fuels by at least 10 percent by 2020.
SPM-6: Regional Transportation-Related Greenhouse Gas Targets	Develop regional greenhouse gas emissions reduction targets for passenger vehicles. SB 375 requires CARB to develop, in consultation with metropolitan planning organizations, passenger vehicle greenhouse gas emissions reduction targets for 2020 and 2035 by September 30, 2010. SB 375 requires metropolitan planning organizations to prepare a sustainable communities strategy to reach the regional target provided by CARB.
SPM-7: Vehicle Efficiency Measures	Implement light-duty vehicle efficiency measures. CARB is pursuing fuel-efficient tire standards and measures to ensure properly inflated tires during vehicle servicing.
SPM-8: Goods Movement	Implement adopted regulations for port drayage trucks and the use of shore power for ships at berth. Improve efficiency in goods movement operations.
SPM-9: Million Solar Roofs Program	Install 3,000 megawatts of solar-electric capacity under California's existing solar programs.
SPM-10: Heavy/Medium-Duty Vehicles	Adopt heavy- and medium-duty vehicle and engine measures. Measures targeting aerodynamic efficiency, vehicle hybridization, and engine efficiency are recommended.
SPM-11: Industrial Emissions	Require assessment of large industrial sources to determine whether individual sources within a facility can cost-effectively reduce greenhouse gas emissions and provide other pollution reduction co-benefits. Reduce greenhouse gas emissions from fugitive emissions from oil and gas extraction and gas transmission. Adopt and implement regulations to control fugitive methane emissions and reduce flaring at refineries.

Scoping Plan Measure	Description
SPM-12: High Speed Rail	Support implementation of a high-speed rail system. This measure supports implementation of plans to construct and operate a high-speed rail system between Northern and Southern California serving major metropolitan centers.
SPM-13: Green Building Strategy	Expand the use of green building practices to reduce the carbon footprint of California's new and existing inventory of buildings.
SPM-14: High Global Warming Potential Gases	Adopt measures to reduce high global warming potential gases. The Proposed Scoping Plan contains 6 measures to reduce high global warming potential gases from mobile sources, consumer products, stationary sources, and semiconductor manufacturing.
SPM-15: Recycling and Waste	Reduce methane emissions at landfills. Increase waste diversion, composting, and commercial recycling. Move toward zero-waste.
SPM-16: Sustainable Forests	Preserve forest sequestration and encourage the use of forest biomass for sustainable energy generation. The federal government and California's Board of Forestry and Fire Protection has the regulatory authority to implement the Forest Practice Act to provide for sustainable management practices. This measure is expected to play a greater role in the 2050 goals.
SPM-17: Water	Continue efficiency programs and use cleaner energy sources to move water. California will also establish a public goods charge for funding investments in water efficiency that will lead to as yet undetermined reductions in greenhouse gases.
SPM-18: Agriculture	In the near-term, encourage investment in manure digesters and at the five-year Scoping Plan update determine if the program should be made mandatory by 2020. Increase efficiency and encourage use of agricultural biomass for sustainable energy production. CARB has begun research on nitrogen fertilizers and will explore opportunities for emission reductions.

Source: California Air Resources Board, Climate Change Scoping Plan, (2008).

Senate Bill 97

In August 2007, the legislature enacted SB 97 (Dutton), which directed the Governor's Office of Planning and Research (OPR) to develop guidelines under CEQA for the mitigation of greenhouse gas emissions. A number of actions have taken place under SB 97, which are discussed below.

OPR Climate Change Technical Advisory

On June 19, 2008, OPR issued a technical advisory as interim guidance regarding the analysis of GHG emissions in CEQA documents.[50] The advisory indicated that a project's GHG emissions, including those associated with vehicular traffic, and construction activities, should be identified and estimated. The advisory further recommended that the lead agency determine significance of the impacts and impose all

50 State of California, Governor's Office of Planning and Research, *CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review*, (2008).

mitigation measures that are necessary to reduce GHG emissions to a less than significant level. The advisory did not recommend a specific threshold of significance.

CEQA Guideline Amendments

In its work to formulate CEQA Guideline Amendments for GHG emissions, OPR submitted the *Proposed Draft CEQA Guideline Amendments for Greenhouse Gas Emissions* to the Secretary for Natural Resources on April 13, 2009. The Natural Resources Agency conducted formal rulemaking procedures in 2009 and adopted the CEQA Guideline Amendments on December 30, 2009.

Senate Bill 375

The California Legislature passed Senate Bill 375 (SB 375) on September 1, 2008, and SB 375 was signed by Governor Schwarzenegger and chaptered into law on September 30, 2008. SB 375 requires CARB, working in consultation with the metropolitan planning organizations (MPOs), to set regional greenhouse gas reduction targets for the automobile and light truck sector for 2020 and 2035. CARB must provide each MPO with its reduction target by September 30, 2010. The target must then be incorporated within that region's Regional Transportation Plan (RTP), which is used for long-term transportation planning, in a Sustainable Communities Strategy (SCS). Certain transportation planning and programming activities would then need to be consistent with the SCS; however, SB 375 expressly provides that the SCS does not regulate the use of land, and further provides that local land use plans and policies (e.g., general plan) are not required to be consistent with either the RTP or SCS.

SB 375 also includes CEQA streamlining provisions for "transit priority projects," so long as the projects are consistent with the SCS. As defined in SB 375, a "transit priority project" shall (1) contain at least 50 percent residential use, based on total building square footage and, if the project contains between 26 and 50 percent nonresidential uses, a floor area ratio of not less than 0.75; (2) provide a maximum net density of at least 20 dwelling units per acre; and (3) be within 0.5 mile of a major transit stop or high quality transit corridor.

California Climate Action Registry and The Climate Action Reserve

The California Climate Action Registry (CCAR) is a private non-profit organization formed by the State of California that serves as a voluntary GHG registry to protect and promote early actions to reduce GHG emissions by organizations. Senate Bill 1771 (SB 1771, Sher) formally established the CCAR with technical changes made to the statute in SB 527, which finalized the structure of the CCAR. The CCAR began with 23 charter members and currently has over 300 corporations, universities, cities and counties, government agencies and environment organizations voluntarily measuring, monitoring, and publicly reporting their

GHG emissions using the CCAR protocols. The CCAR has published a General Reporting Protocol, as well as project- and industry-specific protocols for landfill activities, livestock activities, the cement sector, the power/utility sector, and the forest sector. The protocols provide the principles, approach, methodology, and procedures required for participation in the CCAR.

Due to the growth of the CCAR, it now operates under the Climate Action Reserve,[51] which is a national offsets program for the United States carbon market. As part of this transition, the California Climate Action Registry was instrumental in establishing The Climate Registry, with the mission of expanding the California Registry's emissions reporting work to include all of North America.[52] Emissions inventory reporting is being transitioned to The Climate Registry, and reports for the 2009 reporting year will be the last the California Registry will accept. However, even after that year, the California Registry will continue to represent its members' emissions reports to the state of California.

CAPCOA CEQA and Climate Change White Paper

The California Air Pollution Control Officers Association (CAPCOA) prepared a white paper on CEQA and Climate Change in January 2008. The white paper contains a disclaimer that states the paper is intended to be used as a resource by lead agencies when considering policy options and not as a guidance document. The disclaimer also states that it "is not intended, and should not be interpreted, to dictate the manner in which an air district or lead agency chooses to address GHG emissions in the context of its review of projects under CEQA."[53] Specifically, the white paper discusses three possible approaches to evaluating the significance of GHG emissions and possible mitigation measures; however, CAPCOA does not endorse any particular approach. The three alternative significance approaches are (1) not establishing a significance threshold for GHG emissions, (2) setting the GHG emission threshold at zero, and (3) setting the GHG emission threshold at some non-zero level. The white paper evaluates potential considerations and pitfalls associated with the three approaches. At the end of the white paper, CAPCOA provides a list of potential mitigation measures and discusses each in terms of emissions reduction effectiveness, cost effectiveness, and technical and logistical feasibility.

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51 Additional information about the Climate Action Reserve may be obtained at the following website: http://www.climateactionreserve.org/.

52 Additional information about The Climate Registry may be obtained at the following website: http://www.theclimateregistry.org/.

53 California Air Pollution Control Officers Association, *CEQA & Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act*, (2008).

Regional

In April 2008, the South Coast Air Quality Management District (SCAQMD), in order to provide guidance to local lead agencies on determining the significance of GHG emissions identified in CEQA documents, convened a "GHG CEQA Significance Threshold Working Group."[54] The goal of the working group is to develop and reach consensus on an acceptable CEQA significance threshold for GHG emissions that would be utilized on an interim basis until CARB (or some other state agency) develops statewide guidance on assessing the significance of GHG emissions under CEQA.

Initially, SCAQMD staff presented the working group with a significance threshold that could be applied to various types of projects – residential; non-residential; industrial; etc. However, the threshold is still under development. In December 2008, staff presented the SCAQMD Governing Board with a significance threshold for stationary source projects where it is the lead agency. This threshold uses a tiered approach to determine a project's significance, with 10,000 $MTCO_2e$ as a screening numerical threshold.

At present time, the SCAQMD has not adopted thresholds for projects such as the one analyzed in this technical report. The SCAQMD is considering a tiered approach to determine the significance of residential and commercial projects. The draft approach that was published in October 2008 is as follows:[55]

- Tier 1: Is the project exempt from further analysis under existing statutory or categorical exemptions? If yes, there is a presumption of less-than-significant impacts with respect to climate change.
- Tier 2: Is the project's GHG emissions within the GHG budgets in an approved regional plan? (The plan must be consistent with *State CEQA Guidelines* Sections 15064(h)(3), 15125(d), or 15152(s).) If yes, there is a presumption of less-than-significant impacts with respect to climate change.
- Tier 3: Is the project's incremental increase in GHG emissions below or mitigated to less than the significance screening level (10,000 $MTCO_2e$ per year for industrial projects and 3,000 $MTCO_2e$ for commercial/residential projects) and is the project X percent beyond the Title 24 standard and achieve Y percent reduction in water use (the X and Y values were not determined at the time the draft approach was published)? If yes, there is a presumption of less-than-significant impacts with respect to climate change.
- Tier 4: Does the project meet one of the following performance standards (the performance standards were not well-defined at the time the draft approach was published)? If yes, there is a presumption of less-than-significant impacts with respect to climate change.

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54 For more information see: http://www.aqmd.gov/ceqa/handbook/GHG/GHG.html.

55 South Coast Air Quality Management District, "Greenhouse Gases (GHG) CEQA Significance Thresholds Working Group Meeting #6," http://www.aqmd.gov/ceqa/handbook/GHG/2008/oct22mtg/oct22.html. 2008.

  - Option 1: Uniform Percent Emission Reduction Target Objective (e.g., 30 percent) from BAU by incorporating project design features and/or implementing emission reduction measures.

  - Option 2: Early Implementation of Applicable AB32 Scoping Plan Measures.

  - Option 3: Achieve sector-based standard (e.g., pounds per person, pounds per square foot, etc.).

- Tier 5: Does the project obtain offsets alone or in combination with the above to achieve the target significance screening level (offsets provided for 30-year project life, unless project life limited by permit, lease, or other legally binding conditions)? If yes, there is a presumption of less-than-significant impacts with respect to climate change. Otherwise, the project is significant.

In November 2009, the following revisions were proposed for Tiers 3 and 4:[56]

- Tier 3: Is the project's incremental increase in GHG emissions below or mitigated to less than the significance screening level (10,000 $MTCO_2e$ per year for industrial projects; 3,500 $MTCO_2e$ for residential projects; 1,400 $MTCO_2e$ for commercial projects; 3,000 $MTCO_2e$ for mixed-use or all land use projects)? If yes, there is a presumption of less-than-significant impacts with respect to climate change.

- Tier 4: Does the project meet one of the following performance standards? If yes, there is a presumption of less-than-significant impacts with respect to climate change.

  - Option 1: Achieve a 28 percent reduction from a base case scenario, including land use sector reductions from AB 32 (total emissions not to exceed 25,000 $MTCO_2e$).

  - Option 2: Achieve a project-level efficiency target of 4.6 $MTCO_2e$ per service population (total emissions not to exceed 25,000 $MTCO_2e$) or plan-level efficiency target of 6.6 $MTCO_2e$.

The SCAQMD has not announced when staff is expecting to present a finalized version of these thresholds to the Governing Board. The SCAQMD has also adopted Rules 2700, 2701, and 2702 that address GHG reductions; however, these rules are currently applicable to boilers and process heaters, forestry, and manure management projects.

ENVIRONMENTAL IMPACTS

Thresholds of Significance

The following thresholds for determining the significance of impacts related to air quality and greenhouse gas emissions are contained in the environmental checklist form contained in Appendix G of the most recent update of the *State CEQA Guidelines*.

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56 South Coast Air Quality Management District, "Greenhouse Gases (GHG) CEQA Significance Thresholds Working Group Meeting #14," http://www.aqmd.gov/ceqa/handbook/GHG/2009/nov19mtg/nov19.html. 2009.

Air Quality Thresholds

Impacts related to air quality are considered significant if the proposed project would:

- conflict with or obstruct the implementation of the applicable air quality plan,
- 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 nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors),
- expose sensitive receptors to substantial pollutant concentrations, or
- create objectionable odors affecting a substantial number of people.

Greenhouse Gas Emission Thresholds

Impacts related to greenhouse gas emission are considered significant if the proposed project would:

- generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
- conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The *State CEQA Guidelines* (Section 15064.7) 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 and GHG impacts of the project are evaluated according to thresholds developed by the SCAQMD in their *CEQA Air Quality Handbook*, *Air Quality Analysis Guidance Handbook*, and subsequent guidance. While the SCAQMD has established significance thresholds for lead, construction and operation of the project will not exceed the established thresholds. Therefore, lead emissions from the project will not cause an air quality violation and will not be analyzed further.

Impact Analysis

Each applicable threshold of significance is listed below followed by analysis of the significance of any potential impacts and the identification of mitigation measures that would lessen or avoid potential impacts. Finally, the significance of potential impacts after implementation of all identified mitigation measures is presented.

Air Quality

Threshold: **Would the project conflict with or obstruct the implementation of the applicable air quality plan?**

The *2007 AQMP* is designed to accommodate growth, to reduce the high levels of pollutants within the areas under the jurisdiction of SCAQMD, to achieve the federal 8-hour ozone standard by 2024 and to minimize the impact on the economy. Projects that are considered to be consistent with the AQMP do not interfere with attainment and do not contribute to the exceedance of an existing air quality violation because this growth is included in the projections utilized in the formulation of the AQMP. Therefore, projects, uses, and activities that are consistent with the applicable assumptions used in the development of the AQMP would not jeopardize attainment of the air quality levels identified in the AQMP, even if they exceed the SCAQMD's recommended thresholds. The following analysis discusses the project's consistency with the AQMP.

Projects that are consistent with growth forecasts identified by SCAG are considered consistent with the AQMP growth projections. This is because the growth projections by SCAG form the basis of the land use and transportation control portions of the AQMP. The project is consistent with the future residential figures projected for the region. The project would add 248 residential dwelling units, which would house approximately 290 people. The commercial portion of the project would employ approximately 39 people, which may result in an additional 19 residents in the City (refer to **Section 4.5, Population, Housing and Employment**, for a more detailed discussion on project-related demographics). The potential population increase would account for approximately 4 percent of the anticipated population increase of 8,219 residents within the Arroyo Verdugo Subregion and 10 percent of the anticipated population increase of 3,250 residents within the City of Glendale between 2010 and 2015, (the data for the closest year to the proposed project buildout). The project would not increase population figures over those that have been planned for the area, would be consistent with the AQMP forecasts for this area. Therefore, the project would be consistent with the air quality-related regional plans, and should not jeopardize attainment of state and federal ambient air quality standards in the SoCAB.

Another measurement tool in determining AQMP consistency is to determine how a project accommodates the expected increase in population and employment. Generally, if a project is planned in such a way that results in the minimization of vehicle miles traveled both within the project and in the community in which it is located, and consequently the minimization of air pollutant emissions, it would consistent with the AQMP.[57] The project site is located in close proximity to several modes of public

57 South Coast Air Quality Management District, *CEQA Air Quality Handbook*, 12-5.

transportation, including bus and rail lines. According to the traffic report for the project, existing transit service in the project area will adequately accommodate the estimated project generated transit trips.[58] As a result, vehicle miles traveled and, consequently, air pollutant emissions from mobile sources, would be reduced from the proximity to existing transit facilities.

Level of Significance Before Mitigation: Less than significant.

Mitigation Measures: None are required.

Level of Significance After Mitigation: Less than significant.

Threshold: **Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation as a result of construction activity?**

As mentioned above, construction-related emissions can be designated as on-site or off-site. On-site emissions generated during construction primarily consist of exhaust emissions (VOCs, NO_X, CO, SO_X, PM10, and PM2.5) from heavy-duty diesel powered construction equipment operation, fugitive dust (PM10 and PM2.5) from disturbed soil, and evaporative VOC emissions from asphalt paving and architectural coatings (i.e., painting). Off-site emissions during the construction phase normally consist of exhaust emissions from worker commute trips and on-road haul and vendor trucks.

Construction of the project is anticipated to last approximately 22 months. Demolition would commence in late 2010 and last for about one month. Demolition would involve the use of standard construction equipment including three loaders and backhoes with a pneumatic hammer. These equipment are generally assumed to operate for 8 hours per day. Approximately 20,000 cubic yards of demolition materials would be generated and would require approximately 45 haul-truck trips per day. Grading and excavation would commence after demolition and last for about two months.

Grading and excavation activities would involve the use of two loaders, one hydraulic crane, one drill, one tieback drill, one concrete pump, one excavator, one compressor, and one water truck. These equipment are generally assumed to operate for 8 hours per day. Approximately 40,425 cubic yards of earth materials would be exported from the project site and would require approximately 46 haul-truck trips per day.

Sub-grade construction and building construction would involve the use of standard construction equipment including one crane, two forklifts, two concrete mixers and pump, two air compressors, one

58 Linscott, Law & Greenspan, Engineers, *Traffic and Parking Analysis: Broadway Lofts Project*, (2010).

generator, one tractor or loader, skill saws, and power drills. These equipment are generally assumed to operate for 8 hours per day. During the peak period of building construction, about 215 construction workers per day would be necessary while the latter portion of building construction would require less than 150 construction workers. Emissions would also result from vendor and material delivery trucks traveling to the site. In addition to building construction, emissions would be generated from architectural coating and the paving of driveways, walkways, and other surfaces. These emissions would occur simultaneously with building construction but would not commence until after construction of the structures are well underway.

The URBEMIS2007 Environmental Management Software was used to estimate the emissions associated with construction of the proposed project. URBEMIS2007 is a land use and transportation based computer model designed to estimate regional air emissions from new land use development projects. The model accounts for certain meteorological conditions that characterize specific air basins in California. The model was developed by CARB and is approved for use by the SCAQMD. The URBEMIS2007 model requires the user to input certain variables for calculating emissions. The information described in the previous paragraph, which was used as input variables in the model, is based on conservative or high-end estimates. Normal day-to-day variability in construction activities introduces uncertainties when quantifying daily maximum emissions. However, by relying on high-end estimates, the emissions calculated from the model would account for any emission peaks associated with day-to-day variability.

The URBEMIS2007 emission calculations assume the use of standard construction practices, such as compliance with SCAQMD Rule 403 (Fugitive Dust), to minimize the generation of fugitive dust. Compliance with Rule 403 is mandatory for all construction projects. In the URBEMIS2007 model, the emission calculations take into account compliance with Rule 403 by incorporating the measures below. Rule 403 contains other best available control measures to minimize fugitive dust emissions; however, they are not accounted for in the URBEMIS2007 model.

- Watering of exposed surfaces and unpaved roads three times daily, which is estimated to reduce fugitive dust emissions from this source (PM10 and PM2.5) by 61 percent, per guidance from the SCAQMD; and
- Use of soil stabilization measures during equipment loading and unloading, which is estimated to reduce fugitive dust emissions from this source (PM10 and PM2.5) by 69 percent, per guidance from the SCAQMD.

Based on the above information, the estimated construction emissions are provided below in **Table 4.2-9**, **Estimated Construction Emissions**. It is expected that the project's construction-related activities will either emit the other criteria pollutants (i.e., sulfates, hydrogen sulfide, lead, vinyl chloride, and visibility reducing particles) in nominal quantities (i.e., sulfates), not at all (i.e., hydrogen sulfide, lead, and vinyl

chloride), or will be accounted for by the pollutants actually estimated in this analysis (i.e., visibility reducing particles). For example, visibility reducing particles are associated with particulate matter emissions, which are included in the construction emissions estimate. Sulfates in the atmosphere are associated with SO_x emissions, which are included in the construction emissions estimate. Hydrogen sulfide, lead, and vinyl chloride are not expected to be emitted or would only be emitted in trace amounts. Based on the analysis, construction of the project would not exceed the SCAQMD thresholds of significance for construction.

Table 4.2-9
Estimated Construction Emissions

	Maximum Emissions in Pounds per Day[1]					
Construction Activity	**VOC**	**NO_x**	**CO**	**SO_x**	**PM10**	**PM2.5**
Demolition (2010)						
Fugitive Dust	—	—	—	—	41.33	8.60
Off-Road Equipment	1.82	11.17	6.90	0.00	1.01	0.93
On-Road Vehicles	3.27	42.56	16.34	0.05	1.94	1.67
Worker Vehicles	0.03	0.05	0.88	0.00	0.01	0.00
Maximum pounds per day:	**5.11**	**53.79**	**24.12**	**0.06**	**44.28**	**11.19**
SCAQMD Threshold:	**75**	**100**	**550**	**150**	**150**	**55**
Exceeds Threshold?	NO	NO	NO	NO	NO	NO
Grading and Excavation (2010-2011)						
Fugitive Dust	—	—	—	—	4.82	1.01
Off-Road Equipment	4.83	42.28	18.00	0.00	2.13	1.96
On-Road Vehicles	3.29	42.92	16.48	0.05	1.95	1.68
Worker Vehicles	0.07	0.12	1.98	0.00	0.02	0.01
Maximum pounds per day:	**8.19**	**85.32**	**36.47**	**0.06**	**8.92**	**4.66**
SCAQMD Threshold:	**75**	**100**	**550**	**150**	**150**	**55**
Exceeds Threshold?	NO	NO	NO	NO	NO	NO
Building Construction (2011-2012)						
Building Construction	4.42	26.58	32.31	0.03	1.92	1.69
Architectural Coating	16.07	0.03	0.45	0.00	0.00	0.00
Asphalt Paving	1.77	10.72	8.18	0.00	0.92	0.84
Maximum pounds per day:	**22.26**	**37.33**	**40.95**	**0.03**	**2.85**	**2.53**
SCAQMD Threshold:	**75**	**100**	**550**	**150**	**150**	**55**
Exceeds Threshold?	NO	NO	NO	NO	NO	NO

Source: Impact Sciences, Inc. Emissions calculations are provided in ***Appendix 4.2****.*
Totals in table may not appear to add exactly due to rounding in the computer model calculations.
[1] *PM10 and PM2.5 fugitive dust emissions reflect SCAQMD Rule 403 compliance.*

Level of Significance Before Mitigation: Less than significant.

Mitigation Measures: None are required.

Level of Significance After Mitigation: Less than significant.

Threshold: **Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation as a result of operational activity?**

Area sources emissions would be generated during the consumption of natural gas for space and water heating devices, by natural gas fireplaces, and during the operation of gasoline-powered landscape maintenance equipment and use of consumer products (e.g., hair spray, deodorants, lighter fluid, air fresheners, automotive products, and household cleaners). Mobile source emissions would be generated by the motor vehicles traveling to and from and within the project site.

Area and mobile source emissions were estimated using URBEMIS2007. The project's land uses were entered into the model to estimate area source emissions. It was assumed that all buildings would combust natural gas. The project would house approximately 290 persons, which is approximately 1.17 persons per dwelling unit. Average daily trip (ADT) generation rates used in URBEMIS2007 were obtained from data contained in the traffic report for the project.[59] Trip reductions due to the project's proximity to commercial land uses and public transit were taken into account in the traffic report. The project's area and mobile source emissions, as estimated using URBEMIS2007, are shown in **Table 4.2-10, Estimated Operational Emissions**. Based on the analysis, the project would not exceed the SCAQMD thresholds of significance for operations.

Level of Significance Before Mitigation: Less than significant.

Mitigation Measures: None are required.

Level of Significance After Mitigation: Less than significant.

59 Linscott, Law & Greenspan, Engineers, *Traffic and Parking Analysis: Broadway Lofts Project*, (2010).

Table 4.2-10
Estimated Operational Emissions

Construction Activity	Maximum Emissions in Pounds per Day[1]					
	VOC	NO_x	CO	SO_x	PM10	PM2.5
Summertime Emissions						
Area Sources	6.12	2.85	5.90	0.00	0.03	0.03
Mobile Sources	16.67	21.77	197.23	0.23	37.77	7.35
Maximum pounds per day:	**22.79**	**24.62**	**203.13**	**0.23**	**37.8**	**7.38**
SCAQMD Threshold:	**75**	**100**	**550**	**150**	**150**	**55**
Exceeds Threshold?	NO	NO	NO	NO	NO	NO
Wintertime Emissions						
Area Sources	5.83	4.16	1.84	0.01	0.12	0.12
Mobile Sources	17.57	26.20	190.97	0.20	37.77	7.35
Maximum pounds per day:	**23.40**	**30.36**	**192.81**	**0.21**	**37.89**	**7.47**
SCAQMD Threshold:	**75**	**100**	**550**	**150**	**150**	**55**
Exceeds Threshold?	NO	NO	NO	NO	NO	NO

Source: Impact Sciences, Inc. Emissions calculations are provided in ***Appendix 4.2****.*
Totals in table may not appear to add exactly due to rounding in the computer model calculations.

Threshold: **Would the project expose sensitive receptors to substantial pollutant concentrations?**

The SCAQMD recommends the evaluation of localized air quality impacts to sensitive receptors in the immediate vicinity of the project site as a result of construction and operational activities. The thresholds are based on standards established by the SCAQMD in the *Final Localized Significance Threshold Methodology*. The thresholds for NO_x and CO represent the allowable increase in concentrations above background levels in the vicinity of the project that would not cause or contribute to an exceedance of the relevant ambient air quality standards. The threshold for PM10 and PM2.5 are based on emission levels specified in SCAQMD rules so as to aid in progress toward attainment of the ambient air quality standards.

For project sites of 5 acres or less, the SCAQMD includes screening tables that can be used to determine the maximum allowable daily emissions that would satisfy the thresholds without project-specific dispersion modeling. The allowable emission rates depend on (1) the SRA in which the project is located, (2) the size of the project site, and (3) the distance between the project site and the nearest sensitive receptor (e.g., residences, schools, hospitals).

The project site is approximately 0.8 acre. The nearest sensitive receptor is a condominium building located on the eastern side of the project site. The *Final Localized Significance Threshold Methodology* states that "projects with boundaries located closer than 25 meters to the nearest receptor should use the LSTs for receptors located at 25 meters."[60] Since the nearest sensitive receptor, a residential land use, is located less than 25 meters to the east from the project site, the distance used to determine the mass-rate emissions from the lookup tables is 25 meters. The allowable mass-rate emissions were interpolated for a 0.8-acre site using the specified thresholds for 1- and 2-acre sites.

The localized significance thresholds are compared to construction and operational emissions that occur on the project site. The thresholds do not apply to emissions occurring off the project site, such as motor vehicles. The project's on-site emissions for construction and operation are shown in **Table 4.2-11, Localized Significance Thresholds Analysis**. As shown, construction of the proposed project would generate on-site emissions in excess of the site-specific localized significance thresholds for PM10 and PM2.5.

Table 4.2-11
Localized Significance Thresholds Analysis

	Pollutant (pounds per day)			
Significance Threshold	**NOx**	**CO**	**PM10**	**PM2.5**
Construction				
Maximum Daily On-site Emissions	42.28	20.25	42.34	9.53
Localized Significance Threshold	83.00	442.00	3.43	2.85
Exceeds Threshold?	NO	NO	**YES**	**YES**
Operational				
Maximum Daily On-site Emissions	4.16	5.90	0.12	0.12
Localized Significance Threshold	83.00	442.00	0.82	1.00
Exceeds Threshold?	NO	NO	NO	NO

Source: South Coast Air Quality Management District, Final Localized Significance Threshold Methodology, *(2008), Appendix C.*

[1] *LST thresholds are interpolated from the values in this document, based on the project, location, project size, and the distance to the nearest sensitive receptor.*

[2] *The NOx thresholds contained in the SCAQMD lookup tables are based on emissions of NOx and assume gradual conversion to NO_2 based on the distance from the project site boundary.*

Traffic congestion has to potential to expose sensitive receptors to high levels of CO. Localized areas where ambient concentrations exceed state and/or federal standards are termed CO "hotspots." Such hot spots are defined as locations where the ambient CO concentrations exceed the state or federal ambient

60 South Coast Air Quality Management District, *Final Localized Significance Threshold Methodology*, (2008) 3-3.

air quality standards. CO 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. As a result, potential air quality impacts to sensitive receptors are also assessed through an analysis of localized CO concentrations. Areas of vehicle congestion have the potential to create CO hotspots that exceed the state ambient air quality 1-hour standard of 20 ppm or the 8-hour standard of 9.0 ppm. The federal levels are less stringent than the state standards and are based on 1- and 8-hour standards of 35 and 9 ppm, respectively. Thus, an exceedance condition would occur based on the state standards prior to exceedance of the federal standard.

Traffic-congested roadways and intersections that operate at a level of service (LOS) D, E, or F have the potential to generate localized high levels of CO within approximately 1,000 feet of a roadway. According to the UC Davis *Transportation Project-Level Carbon Monoxide Protocol*, if an intersection operates at a LOS of E or F, it is considered to have the potential for a CO violation and is required to be further analyzed.[61] Also, if project traffic volume worsens an intersection's LOS to E or F from a LOS D or above, this intersection represents a potential for a CO violation and would be required to be further analyzed.[62] The future cumulative plus the proposed project traffic volumes would result in LOS A or B at the project-associated intersections according to the project's traffic study.[63] Therefore, the proposed project would not have the potential of creating CO hotspots. No further analysis is required.

Projects that use hazardous materials or that emit toxic air contaminants (TACs) have to potential to expose sensitive receptors to adverse health impacts. The residential and commercial land uses associated with the proposed project are not anticipated to use hazardous or acutely hazardous materials in appreciable quantities. Hazardous substances currently are regulated under the California Accidental Release Prevention (CalARP) Program. The CalARP Program satisfies the requirements of the Federal Risk Management Plan Program, and contains additional state requirements. The CalARP Program applies to regulated substances in excess of specific quantity thresholds. The majority of the substances have thresholds in the range of 100 to 10,000 pounds. Land uses associated with the project may contain small, if any, amounts of these hazardous substances in household and commercial cleaners and other products. However, typical use of these products would not result in quantities at any one location that exceed the thresholds. Moreover, significant amounts of hazardous substances would typically be expected at industrial, manufacturing, and complex water or wastewater treatment land uses. Accordingly, the project would not result in a significant impact with respect to hazardous materials.

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61 University of California at Davis, Institute of Transportation Studies, *Transportation Project-Level Carbon Monoxide Protocol*, (1997), Section 4.7.3 and 4.7.4.

62 Ibid.

63 Linscott, Law & Greenspan, Engineers, *Traffic and Parking Analysis: Broadway Lofts Project*, (2010).

The proposed residential and commercial land uses may potentially emit trace amounts of TACs but would not exceed the thresholds contained in SCAQMD Rule 1401 (New Source Review of Toxic Air Contaminants) and would not result in an incremental increase in cancer risk of 10 in one million or more or a Hazard Index of 1.0 or more. Diesel-fueled delivery and waste-hauling trucks would drive to and from the project site resulting in emissions of diesel particulate matter. However, the number of trucks would be equal to that occurring in other similarly developed residential and commercial neighborhoods throughout the region. The proposed project may include restaurant uses, which have the potential to emit TACs. Restaurants that use charbroilers to cook meat could emit VOCs and particulate matter. Although charbroilers are not typically considered substantial sources of TACs, the installation of any chain-driven charbroiler would be required to comply with SCAQMD Rule 1138, which requires the use of catalytic oxidizers to reduce VOC and particulate matter emissions. Residential land uses are not substantial sources of TACs as well. Therefore, the site is not expected to generate emissions of TACs that would exceed the SCAQMD's cancer risk threshold of 10 in one million or the non-cancer Hazard Index threshold of 1.0.

CARB has determined that adverse health effects are generally elevated near heavily traveled roadways. The CARB guidance document, *Air Quality and Land Use Handbook*, recommends that lead agencies, where possible, avoid citing new sensitive land uses within 500 feet of a freeway,[64] urban roads with 100,000 vehicles per day, or rural roads with 50,000 vehicles per day. This recommendation is not mandated by state law, but only serves as a general guidance to lead agencies when considering land use projects. The *Air Quality and Land Use Handbook* states that it is up to lead agencies to balance other considerations, including housing and transportation needs, economic development priorities, and other quality of life issues.[65] The project would not locate sensitive land uses within 500 feet of freeways of heavily traveled roads. An analysis of the traffic report for the project indicated average daily trips of 2,918 on the most heavily traveled road, which is well under the 100,000 limit for urban roads.[66] For these reasons, no significant impacts are anticipated with respect to TACs.

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64 California Air Resources Board, *Air Quality and Land Use Handbook*, (2005) p. 8-9. The 2002 study of impacts along the San Diego (I-405) Freeway and the Long Beach (I-710) Freeway cited by CARB in its *Air Quality and Land Use Handbook* found a substantial reduction in pollutant concentrations, relative exposure, and health risk beyond 300 feet.

65 California Air Resources Board, *Air Quality and Land Use Handbook*, (2005) p. 4.

66 Linscott, Law & Greenspan, Engineers, *Traffic and Parking Analysis: Broadway Lofts Project*, (2010).

Level of Significance Before Mitigation: Significant.

Mitigation Measures: The following mitigation measures are proposed to reduce localized impacts of PM10 and PM2.5 during project construction.

4.2-1: The contractor shall use a dust control water misting system to capture airborne dust generated during active demolition of a building, which would reduce fugitive dust emissions by 45 percent.

4.2-2: The contractor shall limit construction-related vehicle speeds to 15 miles per hour on the project site.

4.2-3: The project Applicant shall require all on-site construction equipment to meet EPA Tier 2 or higher emissions standards according to the following:

- April 2010 through December 31, 2011: All off-road diesel-powered construction equipment greater than 50 horsepower (hp) shall meet Tier 2 off-road emissions standards. In addition, all construction equipment shall be outfitted with the BACT devices certified by CARB. Any emissions control device used by the contractor shall achieve emissions reductions that are no less than what could be achieved by a Level 2 or Level 3 diesel emissions control strategy for a similarly sized engine as defined by CARB regulations.

- January 1, 2012 through December 31, 2014: All off-road diesel-powered construction equipment greater than 50 hp shall meet Tier 3 off-road emissions standards. In addition, all construction equipment shall be outfitted with the BACT devices certified by CARB. Any emissions control device used by the contractor shall achieve emissions reductions that are no less than what could be achieved by a Level 3 diesel emissions control strategy for a similarly sized engine as defined by CARB regulations.

Level of Significance After Mitigation: Significant and unavoidable.

Emission reductions for **mitigation measure 4.2-1** were calculated outside of the URBEMIS2007 model. Emission reduction data for the use of a water misting system during demolition was obtained from a U.S. Department of Energy topical report entitled, *Technology Assessment of Dust Suppression Techniques Applied during Structural Demolition*.[67] The report estimated that water misting results in approximately 45 percent dust suppression with a relative standard deviation of 44 percent. Applying this reduction percentage to building demolition fugitive dust, the project would result in fugitive dust PM10 emissions

[67] Ebadian, M. A., Boudreaux, J. F., Dua, S. K., and Williams, P. T., *Technology Assessment of Dust Suppression Techniques Applied during Structural Demolition* (U.S. Department of Energy, 1995-1996), 12, 20.

of 22.73 pounds per day and fugitive dust PM2.5 emissions of 4.73 pounds per day. **Mitigation measure 4.2-2** would reduce grading phase fugitive dust emissions of PM10 to 3.84 pounds per day and PM2.5 to 0.80 pounds per day. **Mitigation measure 4.2-3** would reduce on-site construction exhaust emissions for the demolition and grading phases. However, demolition emissions would still exceed the PM10 and PM2.5 LST thresholds and would have a significant and unavoidable air quality impact.

Threshold: **Would the project create objectionable odors affecting a substantial number of people?**

Certain types of facilities and land uses have the potential to generate odorous emissions. Odorous emissions are subject to nuisance regulations because they can be pervasive enough to annoy a considerable number of persons. The SCAQMD lists the following as land uses primarily associated with odor complaints: waste transfer and recycling stations, wastewater treatment plants, landfills, composting operations, petroleum operations, food and byproduct processes, factories, and agricultural activities, such as livestock operations. The proposed restaurant uses could have a potential to emit odors associated with the preparation and disposal of food products. However, the food will be prepared and disposed of in accordance with local regulations relating to ventilation and refuse disposal. In addition, the food will likely be prepared within an enclosed kitchen area, and not outdoors. Therefore, it is unlikely for substantial nuisance odors to permeate to the outside environment. It is unknown at the time this report was written whether the proposed restaurants would use a chain-driven charbroiler. A chain-driven charbroiler is used to prepare meat, such as hamburger patties. If the project were to install a chain-driven charbroiler, it must comply with the provisions of SCAQMD Rule 1138, which requires the use of catalytic oxidizers to reduce the amount of smoke and gas generated by the cooking of meat. Compliance with Rule 1138 would reduce the emissions of odorous compounds. The residential uses would not generate odorous emissions. Consequently, no significant impacts from odors are anticipated from the proposed project.

Any unforeseen odors generated by the project will be controlled in accordance with SCAQMD Rule 402 (Nuisance). Rule 402 prohibits the discharge of air contaminants 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." Failure to comply with Rule 402 could subject the offending facility to possible fines and/or operational limitations in an approved odor control or odor abatement plan.

Level of Significance Before Mitigation: Less than significant.

Mitigation Measures: None are required.

Level of Significance After Mitigation: Less than significant.

Global Climate Change

Threshold: **Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?**

The SCAQMD has published draft GHG guidelines for assessing the significance of GHG emissions. As described above, the draft guidelines recommend that mixed-use projects meet a threshold of 3,000 metric tons of carbon dioxide equivalents ($MTCO_2e$). If a project exceeds the threshold, it should demonstrate a reduction in GHG emissions equivalent to AB 32 or meet a per capita GHG intensity of 4.6 $MTCO_2e$. The significance of the project's GHG emissions will be evaluated based on the SCAQMD draft GHG guidelines.

Construction and operation of the project would result in the generation of GHGs. These emissions, primarily CO_2, CH_4, and N_2O, are the result of fuel combustion from building heating systems and motor vehicles. Building and motor vehicle air conditioning systems may use HFCs (and HCFCs and CFCs to the extent that they have not been completely phased out at later dates). Motor vehicle HFCs are included in the emission estimates; however, HFCs from building air conditioning systems are not quantified since air conditioning equipment specifications for individual buildings are not known at this time and emissions would primarily occur through accidental leaks.

Direct emissions of CO_2, the primary GHG would be due to fossil fuel combustion during construction, natural gas consumption and mobile-source emissions. Emission factors for GHGs due to natural gas consumption were obtained from the California Climate Action Registry *General Reporting Protocol*.[68] Mobile-source emissions were calculated using URBEMIS2007, based on trip generation rates provided by the traffic report for the project.[69] URBEMIS2007 provides only CO_2 emissions; therefore, to account for other GHGs associated with fossil fuel combustion, the CO_2 emissions associated with project-generated trips were multiplied by a factor based on an U.S. EPA assumption that CO_2 represents 95

68 California Climate Action Registry, *General Reporting Protocol: Reporting Entity-Wide Greenhouse Gas Emissions*, Version 3.1, (2009) 101-103.

69 Linscott, Law & Greenspan, Engineers, *Traffic and Parking Analysis: Broadway Lofts Project*, (2010).

percent of the CO_2e emissions associated with passenger vehicles, which account for most of the project-related trips.[70]

The project would also result in indirect GHG emissions due to electricity demand. Emission factors for GHGs due to electricity demand were obtained from The Climate Registry's *Local Government Operations Protocol*, which contains GHG emission factors from utility providers in California.[71] The emission factors take into account the current mix of energy sources used to generate electricity and the relative carbon intensities of these sources, and includes natural gas, coal, nuclear, large hydroelectric, and other renewable sources of energy.

In addition to electrical demand, operation of the project would result in indirect GHG emissions due to water demand, wastewater generation, and solid waste generation. GHG emissions from water demand are due to the electricity needed to convey, treat, and distribute potable water. The annual electrical demand factor for water demand was obtained from the CEC.[72] GHG emissions from wastewater are due to the electricity needed to treat wastewater. GHG emissions from solid waste generation are due to the decomposition of organic material, which releases CH_4 into the atmosphere. GHG emission factors for wastewater treatment[73] and solid waste generation[74] were obtained from the U.S. EPA.

The project incorporates design features that would reduce GHG emissions. The traffic report for the project identified trips reductions based on the mixed-use characteristics of the project and that the project would locate in a developed area with other commercial land uses and public transportation options nearby. These trips reductions were accounted for in the emissions analysis. In addition, area source emissions due to natural gas combustion were discounted in accordance with revisions to the Title 24 building code standards. According to the CEC, the Title 24 (2008) standards would reduce natural gas combustion by 7 percent for multi-family residential units and 9.4 percent for non-residential buildings. These reductions were taken into account in the URBEMIS2007 model, which was released prior to the adoption of the Title 24 (2008) standards. In addition, the project would be designed to achieve the Leadership in Energy and Environmental Design (LEED) Silver Certification. LEED certification is based on achieving a certain number of points in various categories, such as energy efficiency and water

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70 US Environmental Protection Agency, Office of Transportation and Air Quality, *Greenhouse Gas Emissions from a Typical Passenger Vehicle (EPA420-F-05-004)*, (2005) 4.

71 The Climate Registry, *Local Government Operations Protocol*, Version 1.1, (2010) 208.

72 California Energy Commission, *Refining Estimates of Water-Related Energy Use in California*, PIER Final Project Report (CEC-500-2006-118), (2006) 22.

73 U.S. Environmental Protection Agency, *Compilation of Air Pollutant Emission Factors, AP-42,* Fifth Edition, Volume I, Chapter 4.3.5, (1998).

74 U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, *Greenhouse Gas Emission Factors for Management of Selected Materials in Municipal Solid Waste* (EPA-530-R-98-013), (1998).

efficiency. Design specifications have not been finalized; therefore, it is not known what level of energy efficiency the project would achieve beyond Title 24 (2008) requirements. Many LEED Silver Certified projects exceed 20 percent energy efficiency beyond Title 24 (2008) requirements. As a conservative approach, it was assumed that the project would achieve 10 percent reduction in energy use and 10 percent reduction in water use. The project would also incorporate other features that would reduce GHG emissions. The following is a list of project design features that would reduce GHG emissions:

- Urban Mixed-Use Development: Development of projects predominantly characterized by properties on which various uses, such as residential, commercial, and recreational are combined in a single building or on a single site in an integrated development project with functional interrelationships and a coherent physical design would reduce vehicle trips and vehicle miles traveled.

- Residential Density: High-density residential developments would reduce vehicles trips.

- Energy Efficiency: The proposed project would achieve Leadership in Energy and Environmental Design (LEED) Silver Certification.

- Rooftop Amenities: The roof top amenity deck would have 10 private areas underneath green planted trellises to provide the residents with private dining areas and outdoor "living rooms," as well as two barbeque areas, two fire pit areas, two spas, and one sundeck. The roof top amenity deck would have a dog park, a putting green, bocce area (similar to lawn bowing, but in natural soil), and an outdoor media area for showing movies. The incorporation of vegetation on the rooftop would reduce cooling loads and reduce electricity consumption.

A summary of the proposed project's GHG emissions is presented in **Table 4.2-12, Direct and Indirect Greenhouse Gas Emissions**. The construction-related GHG emissions would occur during active construction, after which time there would be no further construction-related emissions. The SCAQMD recommends annualizing construction-related GHG emissions over the project's lifetime in order to include these emissions as part of the annual total emissions. The SCAQMD has defined a project lifetime to be a 30 year period. Therefore, the construction GHG emissions have been annualized over this period and included in the annual total. The operational GHG emissions would occur once the project becomes operational and would continue for the expected life of the project. Operational emissions would tend to decrease with each succeeding year, for reasons discussed later in this section. Therefore, the annual GHG emissions in **Table 4.2-12** represent maximum year emissions. As shown, the emissions would exceed the SCAQMD's draft threshold of 3,000 $MTCO_2e$ and a GHG intensity of 4.6 $MTCO_2e$. Therefore, significance should be determined based on the project reducing its GHG emissions equivalent to AB 32.

Table 4.2-12
Direct and Indirect Greenhouse Gas Emissions

GHG Emissions Source	Annual Emissions ($MTCO_2e$)
One-Time Construction Emissions:	1,663.05
Annual Emissions:	
Amortized Construction	55.44
Motor Vehicles	3,817.78
Natural Gas and Landscaping	590.67
Electricity Demand	674.20
Solid Waste	239.93
Water Supply	94.79
Wastewater	14.49
Total Annual Emissions:	5,487.29

Source: Impact Sciences, Inc. Emission calculations are provided in ***Appendix 4.2****.*
Totals in table may not appear to add exactly due to rounding.

The core mandate of AB 32 is that statewide GHG emissions in 2020 be equal to 1990 levels. AB 32 is anticipated to secure emission reductions through a variety of mechanisms, such as increasing energy efficiency and introducing more renewable energy sources. As required under AB 32, on December 6, 2007, CARB approved the 1990 greenhouse gas emissions inventory, thereby establishing the emissions limit for 2020. The 2020 emissions limit was set at 427 $MMTCO_2e$. Utilizing 2002 through 2004 data as "business as usual" (BAU) conditions, CARB projected 2020 emissions at 596 $MMTCO_2e$. Therefore, the state would have to reduce projected 2020 emissions by at least 28.4 percent in order to achieve the AB 32 mandate.

CARB has already begun to adopt strategies to reduce GHG emissions under AB 32. However, many of the emission reduction strategies associated with AB 32 are generally applied at the state level. As listed in **Table 4.2-8**, strategies included in the *Climate Change Scoping Plan*, such as SPM-2 (California Light-Duty Vehicle GHG Standards), SPM-3 (Energy Efficiency), SPM-4 (Renewables Portfolio Standard), SPM-5 (Low Carbon Fuel Standard), SPM-7 (Vehicle Efficiency Measures), and SPM-10 (Heavy/Medium-Duty Vehicles), while applicable to land use projects, are generally not under the control of local agencies. Nonetheless, emission reductions from these strategies are anticipated to occur as CARB adopts and implements regulations under AB 32. Reductions are already expected to take place in 2012, if not earlier, due to the newly adopted vehicle emission standards and the Low Carbon Fuel Standard.

Since the project is assessed with a buildout date of 2012, reduction associated with AB 32 will not occur at buildout but will phase in over time. Therefore, the project's GHG emissions shown above represent worst-case maximum emissions, which will decline as AB 32 strategies are adopted and implemented.

Consistent with the manner in which the AB 32 GHG reduction goal was established, the project's emissions are compared to a hypothetical BAU case defined as the emissions that would occur from a similar project, during the 2002 through 2004 baseline period without any project features or measures beyond those required by statute or regulation that would reduce GHG emissions. The 2002 through 2004 period is used as the BAU case because CARB utilized data from this period when establishing the state's 2020 GHG emissions cap under AB 32.

The BAU emissions were determined for a project with identical characteristics as the proposed project; however, the GHG emissions were modeled using factors from the time period consistent with CARB's AB 32 analysis. For example, the GHG emission factors for electricity were generally based on data from the 2002 through 2004 period. This results in a slight increase in GHG emissions for every unit of electricity delivered because the mix of energy sources used to generate electricity at the time included more relatively carbon intense sources. As utility providers have incorporated more renewable energy sources into their mix, GHG emissions for every unit of electricity delivered would decline. In addition, the BAU emissions utilized default trip generation rates from the eighth edition of the Institute of Transportation Engineers' *Trip Generation* manual.[75] The BAU emissions also did not take into account emissions reductions from specific project design features or reductions from compliance with the Title 24 (2008) building standards code.

The effect of the AB 32 measures discussed in the previous section are presented in **Table 4.2-13, Comparison of Project Greenhouse Gas Emissions with AB 32 Reductions to Business as Usual**. As shown, the project would reduce its emissions by 40.6 percent compared to the BAU condition, after the AB 32 strategies are in place. Detailed calculations are provided in **Appendix 4.2**. Based on this assessment, the proposed project would reduce its emissions consistent with AB 32 and would not interfere with the state's ability to meet its GHG reduction mandate under AB 32.

Based on the analysis above, the project would not exceed the draft GHG significance thresholds that are under consideration by the SCAQMD.

75 Institute of Transportation Engineers, *Trip Generation*, 8th Edition, (2008).

Table 4.2-13
Comparison of Project Greenhouse Gas Emissions with AB 32 Reductions to Business as Usual

GHG Emissions Source	Emissions (Metric Tons CO_2e per year)		
	BAU Project	Proposed Project (Plus Features and AB 32)	Percent Reduction from BAU
Amortized Construction	55	55	0.0%
Operational (Mobile)	4,802	2,684	44.1%
Natural Gas and Landscaping	706	535	24.3%
Electricity	893	427	52.2%
Solid Waste	240	240	0.0%
Water	105	95	10.0%
Wastewater	14	14	0.0%
Annual Total	**6,817**	**4,050**	**40.6%**

Source: Impact Sciences, Inc. Emissions calculations are provided in ***Appendix 4.2.***
Totals in table may not appear to add exactly due to rounding.

Level of Significance Before Mitigation: Less than significant.

Mitigation Measures: None are required.

Level of Significance After Mitigation: Less than significant.

Cumulative Impacts

Air Quality

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

In large part, the SCAQMD 2007 AQMP was prepared to accommodate growth, to meet state and federal air quality standards, and to minimize the fiscal impact that pollution control measures have on the local economy. According to the SCAQMD *CEQA Air Quality Handbook*, projects that are within the emission thresholds identified above should be considered less than significant on a cumulative basis unless there

is other pertinent information to the contrary.[76] As shown in **Table 4.2-9** and **Table 4.2-10**, construction and operational emissions would not exceed the SCAQMD project-level thresholds of significance. Therefore, the project would be less than significant on a cumulative basis.

Level of Significance Before Mitigation: Less than significant.

Mitigation Measures: None are required.

Level of Significance After Mitigation: Less than significant.

Global Climate Change

Threshold: **Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?**

The goal of AB 32 is to reduce statewide GHG emissions to 1990 levels by 2020. In December 2008, CARB adopted the *Climate Change Scoping Plan*, which details strategies to meet that goal. The Scoping Plan instructs local governments to establish sustainable community strategies to reduce GHG emissions associated with transportation, energy, and water, as required under SB 375. Planning efforts that lead to reduced vehicle trips while preserving personal mobility should be undertaken in addition to programs such as employee transit incentives, telework programs, car sharing, parking policies, public education programs and other strategies that enhance and complement land use and transit strategies. The *Climate Change Scoping Plan* also recommends energy-efficiency measures in buildings such as maximizing the use of energy-efficient appliances and solar water heating as well as complying with green building standards that result in decreased energy consumption compared to Title 24 building codes. In addition, the *Climate Change Scoping Plan* encourages the use of solar photovoltaic panels and other renewable sources of energy to provide clean energy and reduce fossil-fuel based energy.

In addition to the measures listed in the *Climate Change Scoping Plan*, other state offices have provided recommended measures that would assist lead agencies in determining consistency with the state's GHG reduction goals. The California Attorney General's Office (AGO) has stated that lead agencies can play an important role in "moving the State away from 'business as usual' and toward a low-carbon future."[77] The AGO has released a guidance document that provides information to lead agencies that may be helpful in carrying out their duties under CEQA with respect to GHGs and climate change impacts. Provided in the document are measures that can be included as project design features, required changes

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76 South Coast Air Quality Management District, *CEQA Air Quality Handbook*, 9–12.

77 California Office of the Attorney General, *The California Environmental Quality Act: Addressing Global Warming Impacts at the Local Agency Level*, (2008)

to the project, or mitigation measures at the project level and at the general-plan level. The measures are not intended to be exhaustive and may not be appropriate for every project or general plan. The AGO affirms that "the decision of whether to approve a project—as proposed or with required changes or mitigation—is for the local agency, exercising its informed judgment in compliance with the law and balancing a variety of public objectives."

The proposed Specific Plan's is generally consistent with the goal of AB 32. As shown above, the proposed Specific Plan would reduce GHG emissions by more than 29 percent compared to the BAU case, inclusive of AB 32 reductions. The project would also be designed to reduce energy and water consumption and would reduce vehicle trips and vehicles miles traveled due to the mixed-use and urban infill characteristics—all of which are features that are consistent with existing recommendations to reduce GHG emissions. Therefore, the project would result in a less than significant cumulative impact for GHG emissions.

Level of Significance Before Mitigation: Less than significant.

Mitigation Measures: None are required.

Level of Significance After Mitigation: Less than significant.