H. AIR QUALITY

This section has been prepared using methods and assumptions recommended in the air quality impact assessment guidelines of the Bay Area Air Quality Management District (BAAQMD).[1] In keeping with these guidelines, this chapter describes existing air quality, impacts of future traffic on local carbon monoxide levels, impacts of land use-related vehicular emissions that have regional effects, and the expected effects of local air pollution on future residents of the Plan Area. Mitigation measures to reduce or eliminate potentially significant air quality impacts are identified, where appropriate.

1. Setting

The following discussion provides an overview of existing air quality conditions in the region and the project site. Air quality standards and the regulatory framework relating to air quality are summarized. Climate, air quality conditions, and typical air pollutant types and sources are described.

a. Air Quality Standards, Regulatory Framework and Attainment Status. Air quality standards, the regulatory framework, and State and federal attainment status are discussed below.

(1) Air Quality Standards. Both the State and federal governments have established health-based Ambient Air Quality Standards for six air pollutants: carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), and suspended particulate matter (PM). In addition, the State has set standards for sulfates, hydrogen sulfide, vinyl chloride and visibility reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety.

In addition to primary and secondary Ambient Air Quality Standards, the State of California has established a set of episode criteria for O_3, CO, NO_2, SO_2, and PM. These criteria refer to episode levels representing periods of short-term exposure to air pollutants that threaten public health. Health effects are progressively more severe as pollutant levels increase from Stage One to Stage Three.

California Ambient Air Quality Standards and National Ambient Air Quality Standards for the criteria air pollutants are listed in Table IV.H-1. Health effects of these criteria pollutants are described in Table IV.H-2.

(2) Attainment Status Designations. The California Air Resources Board is required to designate areas of the State as attainment, nonattainment or unclassified for all State standards. An "attainment" designation for an area signifies that pollutant concentrations did not violate the standard for a pollutant in that area. A "nonattainment" designation indicates that a pollutant concentration violated the standard at least once, excluding those occasions when a violation was caused by an exceptional event, as defined in the criteria. An "unclassified" designation signifies that data does not support either an attainment or nonattainment status. The California Clean Air Act divides districts into moderate, serious, and severe air pollution categories, with increasingly stringent control requirements mandated for each category.

[1] Bay Area Air Quality Management District, 1999. *BAAQMD CEQA Guidelines: Assessing the Air Quality Impacts of Projects and Plans*. December.

Table IV.H-1: Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]		Federal Standards[b]		
		Concentration[c]	Method[e]	Primary[b,e]	Secondary[c,f]	Method[g]
Ozone (O_3)	1-Hour	0.09 ppm (180 μg/m^3)	Ultraviolet Photometry	No federal standard	Same as Primary Standard	Ultraviolet Photometry
	8-Hour	0.07 ppm (137 μg/m^3)		0.08 ppm (157 μg/m^3)		
Respirable Particulate Matter (PM_{10})	24-Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 μg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 μg/m^3		–		
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	No Separate State Standard		35 μg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 μg/m^3	Gravimetric or Beta Attenuation	15 μg/m^3		
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m^3)	Nondispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m^3)	None	Nondispersive Infrared Photometry (NDIR)
	1-Hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
	8-Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		–		
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (56 mg/m^3)	Gas Phase Chemiluminescence	0.053 ppm (100 μg/m^3)	Same as Primary Standard	Gas Phase Chemiluminescence
	1-Hour	0.18 ppm (338 µg/m^3)		–		
Lead	30-day average	1.5 μg/m^3	Atomic Absorption	–	–	High-Volume Sampler and Atomic Absorption
	Calendar Quarter	–		1.5 μg/m^3	Same as Primary Standard	
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	–	Ultraviolet Fluorescence	0.030 ppm (80 μg/m^3)	–	Spectrophoto-metry (Pararosanilin e Method)
	24-Hour	0.04 ppm (105 μg/m^3)		0.14 ppm (365 μg/m^3)	–	
	3-Hour	–		–	0.5 ppm (1300 μg/m^3)	
	1-Hour	0.25 ppm (655 μg/m^3)		–	–	
Visibility-Reducing Particles	8-Hour	Extinction coefficient of 0.23 per kilometer - visibility of 10 miles or more (0.07–30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		**No Federal Standards**		
Sulfates	24-Hour	25 μg/m^3	Ion Chromatography			
Hydrogen Sulfide	1-Hour	0.03 ppm (42 μg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[h]	24-Hour	0.01 ppm (26 μg/m^3)	Gas Chromatography			

Source: California Air Resources Board (ARB), 2007.

Footnotes:

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

[b] National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 mg/m^3 is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the EPA for further clarification and current federal policies.

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

[d] Any equivalent procedure that can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

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

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

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

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

Table IV.H-2: Health Effects of Major Criteria Pollutants

Pollutant	Health Effects	Examples of Sources
Suspended Particulate Matter ($PM_{2.5}$ and PM_{10})	• Reduced lung function. • Aggravation of the effects of gaseous pollutants. • Aggravation of respiratory and cardio respiratory diseases. • Increased cough and chest discomfort. • Soiling. • Reduced visibility.	• Stationary combustion of solid fuels. • Construction activities. • Industrial processes. • Atmospheric chemical reactions.
Ozone (O_3)	• Breathing difficulties • Lung damage	• Formed by chemical reactions of air pollutants in the presence of sunlight; common sources are motor vehicles, industries, and consumer products
Carbon Monoxide (CO)	• Chest pain in heart patients • Headaches, nausea • Reduced mental alertness • Death at very high levels	• Any source that burns fuel, such as cars, trucks, construction and farming equipment, and residential heaters and stoves
Nitrogen Dioxide (NO_2)	• Lung damage	• See carbon monoxide sources
Toxic Air Contaminants	• Cancer • Chronic eye, lung, or skin irritation • Neurological and reproductive disorders	• Cars and trucks, especially diesels • Industrial sources such as chrome platers • Neighborhood businesses such as dry cleaners and service stations • Building materials and products

Source: ARB, 2005.

The U.S. EPA designates areas for O_3, CO, and NO_2 as either "does not meet the primary standards," or "cannot be classified," or "better than national standards." For SO_2, areas are designated as "does not meet the primary standards," "does not meet the secondary standards," "cannot be classified" or "better than national standards." In 1991, new nonattainment designations were assigned to areas that had previously been classified as Group I, II, or III for PM_{10} based on the likelihood that they would violate national PM_{10} standards. All other areas are designated "unclassified."

Table IV.H-3 provides a summary of the attainment status for the San Francisco Bay Area with respect to national and State ambient air quality standards.

b. Existing Climate and Air Quality. Regional air quality, local climate and air quality in the San Francisco Bay Area, and air pollution climatology are described below.

(1) Regional Air Quality. The Plan Area is in the City of Benicia on the north side of Carquinez Strait, which is located in the San Francisco Bay Area, a large, shallow air basin ringed by hills which taper into a number of sheltered valleys around the perimeter. Two primary atmospheric outlets exist. One is through the strait known as the Golden Gate, which is a direct outlet to the ocean. The second extends to the northeast, along the west delta region of the Sacramento and San Joaquin Rivers.

Air quality conditions in the San Francisco Bay Area have improved significantly since the BAAQMD was created in 1955. Ambient concentrations of air pollutants and the number of days on which the region exceeds air quality standards have fallen dramatically. Public health benefits, improved visibility, and reduced damage to plants and materials are among the benefits of cleaner air.

BAAQMD's Bay Area Clean Air Plans (CAPs) contain district-wide control measures to reduce carbon monoxide and ozone precursor emissions. The State standards for these pollutants are more stringent than the national standards.

(2) Local Climate and Air Quality. Air quality is a function of both local climate and local sources of air pollution. Air quality is the balance of the natural dispersal capacity of the atmosphere and emissions of air pollutants from human uses of the environment.

The City of Benicia lies on the north side of the Carquinez Strait. The Carquinez Strait is the only sea-level gap in the central and northern California coastal mountains, which results in relatively strong and persistent winds. Winds are generally greatest during spring and summer and lowest in fall and winter. A strong daily variation in wind occurs in spring and summer, with peak winds occurring in the late afternoon hours and winds gradually decreasing at night. During fall and winter, winds are generally more variable both in speed and direction as the area is influenced by storms from the Pacific Ocean.

The occurrence of episodes of high atmospheric stability, known as inversion conditions, severely limits the ability of the atmosphere to disperse pollutants vertically. Inversions are experienced during all seasons in the Bay Area, but are particularly prevalent in the summer months when they are present about 90 percent of the time in both morning and afternoon.

Table IV.H-3: Bay Area Attainment Status

Pollutant	Averaging Time	California Standards[a]		National Standards[b]	
		Concentration	Attainment Status	Concentration	Attainment Status
Carbon Monoxide (CO)	8-Hour	9 ppm (10 mg/m^3)	Attainment	9 ppm (10 mg/m^3)	Attainment[c]
	1-Hour	20 ppm (23 mg/m^3)	Attainment	35 ppm (40 mg/m^3)	Attainment
Nitrogen Dioxide (NO_2)	Annual Mean	0.030 ppm (56 mg/m^3)	Attainment	0.053 ppm (100 µg/m^3)	Attainment
	1-Hour	0.18 ppm (338 µg/m^3)	Attainment	Not Applicable	Not Applicable
Ozone (O_3)	8-Hour	0.07 ppm (137 µg/m^3)	Not Established	0.08 ppm (157µg/m^3)	Nonattainment
	1-Hour	0.09 ppm (180 µg/m^3)	Nonattainment	Not Applicable	Not Applicable[d]
Suspended Particulate Matter (PM_{10})	Annual Mean	20 µg/m^3	Nonattainment		
	24-Hour	50 µg/m^3	Nonattainment	150 µg/m^3	Unclassified
Suspended Particulate Matter ($PM_{2.5}$)	Annual Mean	12 µg/m^3	Nonattainment	15 µg/m^3	Attainment
	24-Hour	Not Applicable	Not Applicable	35 µg/m^3	Unclassified
Sulfur Dioxide (SO_2)	Annual Mean	Not Applicable	Not Applicable	80 µg/m^3 (0.03 ppm)	Attainment
	24-Hour	0.04 ppm (105 µg/m^3)	Attainment	365 µg/m^3 (0.14 ppm)	Attainment
	1-Hour	0.25 ppm (655 µg/m^3)	Attainment	Not Applicable	Not Applicable

[a] California standards for O_3, CO (except Lake Tahoe), SO_2 (1-hour and 24-hour), NO_2 and PM_{10} are values that are not to be exceeded. If the standard is for a 1-hour, 8-hour, or 24-hour average, then some measurements may be excluded. In particular, measurements are excluded that ARB determines would occur less than once per year on average.
[b] National standards other than for 0_3 and those based on annual averages or annual arithmetic means are not to be exceeded more than once a year. For example, the 0_3 standard is attained if, during the most recent 3-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than 1.
[c] In April 1998, the Bay Area was redesignated to Attainment for the national 8-hour CO standard.
[d] The National 1-hour ozone standard was revoked by U.S. EPA on June 15, 2005.

Lead (Pb) is not listed in the above table because it has been in attainment since the 1980s.

ppm = parts per million
mg/m^3 = milligrams per cubic meter
µg/m^3 = micrograms per cubic meter

Source: Bay Area Air Quality Management District, 2007. Bay Area Attainment Status.

Topography also affects air quality. Benicia is located between the expansive Sacramento and San Joaquin Valleys to the east and the San Francisco Bay to the west, and the large summertime temperature differences between these two areas result in a strong flow of generally westerly winds that dilute and transport air pollutants.

The amount of a given air pollutant in the atmosphere is determined by the amount of pollutant released and the atmosphere's ability to transport and/or dilute that pollutant. The major determinants of transport and dilution are wind, atmospheric stability, terrain and, for photochemical pollutants, sunshine. Benicia has a relatively low natural atmospheric potential for pollution given the persistent

and strong winds typical of the area. These winds dilute pollutants and influence air quality in the Sacramento and San Joaquin valleys. Benicia's location downwind of the greater Bay Area, however, also means that pollutants from other areas are transported to Benicia.

Exceedances of air quality standards occur primarily during meteorological conditions conducive to high pollution levels, such as cold, windless winter nights or hot, sunny summer afternoons. The major pollutants of concern in the San Francisco Bay Area, ozone, carbon monoxide, and particulate matter are monitored at a number of locations. The BAAQMD maintains a monitoring site in Benicia, but it monitors only one pollutant; sulfur dioxide, which is primarily released by industrial sources. The second-closest monitoring station is located in Vallejo.

Pollutant monitoring results for the years 2004 to 2006 (see Table IV.H-4) at the Vallejo ambient air quality monitoring station indicate that air quality in the project area has generally been good. Although PM_{10} California standards were violated in 2004 and 2005, as indicated in the monitoring results, no violations of the federal PM_{10} standard were recorded during the period of 2003 to 2005. The federal $PM_{2.5}$ standard was not exceeded during the 3-year period. The State 1-hour O_3 standard also was not exceeded at this monitoring station during the 3-year period. The federal 8-hour ozone standard was not exceeded within the past 3 years at this monitoring station. CO, SO_2, and NO_2 standards were not exceeded in this area during the 3-year period.

(3) Climate Change. Global climate change now generally understood to result from the decades-long rise in greenhouse gas emissions is currently one of the most important and widely debated scientific, economic, and political issues in the United States. Global climate change is a change in the average weather of the earth, which can be measured by wind patterns, storms, precipitation, and temperature. Historical records have shown that temperature changes have occurred in the past, such as during previous ice ages. Some data indicates that the current temperature record differs from previous climate changes in rate and magnitude. The Earth's climate is continuously evolving, although over the last 10,000 years the global climate has been fairly stable.[2] However, over more recent decades, there has been a rapid change in the global climate and an increase in pollutants that affect climate change attributable to human activities.[3]

Activities such as the burning of coal, oil, and natural gas and loss of forests to accommodate agriculture and urban centers over the last century have affected the atmospheric concentrations of chemical compounds such as carbon dioxide, methane, and nitrous oxide. In particular, concentrations of atmospheric carbon dioxide have risen by approximately 30 percent since the late 1800s. Global annual average surface temperatures have also been increasing over this same time period, with data indicating the greatest changes occurring in the last 50 years.[4]

[2] Association of Environmental Professionals, 2007. Recommendations by the Association of Environmental Professionals (AEP) on How to Analyze Greenhouse Gas Emissions and Global Climate Change in CEQA Documents. March 5.

[3] California Environmental Protection Agency, 2006. *Climate Action Team Report to Governor Schwarzenegger and Legislature*. March.

[4] Ibid.

Table IV.H-4: Ambient Air Quality at the Vallejo-Tuolumne Street Monitoring Station

Pollutant	Standard	2004	2005	2006
Carbon Monoxide (CO)				
Maximum 1 hr concentration (ppm)		4.0	3.9	3.7
Number of days exceeded:	State: > 20 ppm	0	0	0
	Federal: > 35 ppm	0	0	0
Maximum 8 hr concentration (ppm)		3.4	3.1	2.9
Number of days exceeded:	State: > 9 ppm	0	0	0
	Federal: > 9 ppm	0	0	0
Ozone (O_3)				
Maximum 1 hr concentration (ppm)		0.104	0.087	0.080
Number of days exceeded:	State: > 0.09 ppm	0	0	0
Maximum 8 hr concentration (ppm)		0.069	0.070	0.069
Number of days exceeded:	State: > 0.07 ppm	ND	ND	ND
	Federal: > 0.08 ppm	0	0	0
Coarse Particulates (PM_{10})				
Maximum 24 hr concentration ($\mu g/m^3$)		50	49	47
Number of days exceeded:	State: > 50 $\mu g/m^3$	1	1	0
	Federal: > 150 $\mu g/m^3$	0	0	0
Annual arithmetic average concentration ($\mu g/m^3$)		19	17	19
Exceeded for the year:	State: > 20 $\mu g/m^3$	No	No	No
	Federal: > 50 $\mu g/m^3$	No	No	No
Fine Particulates ($PM_{2.5}$)				
Maximum 24 hr concentration ($\mu g/m^3$)		40	44	42
Number of days exceeded:	Federal: > 65 $\mu g/m^3$	0	0	0
Annual arithmetic average concentration ($\mu g/m^3$)		11.1	9.7	9.8
Exceeded for the year:	State: > 12 $\mu g/m^3$	No	No	No
	Federal: > 15 $\mu g/m^3$	No	No	No
Nitrogen Dioxide (NO_2)				
Maximum 1 hr concentration (ppm)		0.049	0.070	0.055
Number of days exceeded:	State: > 0.25 ppm	0	0	0
Annual arithmetic average concentration (ppm)		0.012	0.011	0.012
Exceeded for the year:	Federal: > 0.053 ppm	No	No	No
Sulfur Dioxide (SO_2)				
Maximum 1 hr concentration (ppm)		0.016	0.011	0.016
Number of days exceeded:	State: > 0.25 ppm	ND	ND	ND
Maximum 3 hr concentration (ppm)		0.011	0.008	0.012
Number of days exceeded:	Federal: > 0.5 ppm	0	0	0
Maximum 24 hr concentration (ppm)		0.005	0.005	0.004
Number of days exceeded:	State: > 0.04 ppm	0	0	0
	Federal: > 0.14 ppm	0	0	0
Annual arithmetic average concentration (ppm)		0.002	0.002	0.001
Exceeded for the year:	Federal: > 0.030 ppm	No	No	No

Source: ARB and EPA Web sites.
ppm = parts per million
$\mu g/m^3$ = micrograms per cubic meter
ND = No data. There was insufficient (or no) data to determine the value.

California is a substantial contributor of greenhouse gas emissions. California's total carbon dioxide emissions from fossil fuel combustion in 2002 were 360 million tons, which account for approximately 7 percent of the United States emissions from this source.

c. Air Quality Issues. Six key air quality issues – CO hotspots, vehicle emissions, fugitive dust, odors, construction equipment exhaust, and global climate change – are described below.

(1) Local Carbon Monoxide Hotspots. Local air quality is most affected by CO emissions from motor vehicles. CO is typically the pollutant of greatest concern because it is created in abundance by motor vehicles and it does not readily disperse into the air. Because CO does not readily disperse, areas of vehicle congestion can create "pockets" of high CO concentration called "hot spots." These pockets have the potential to exceed the State 1-hour standard of 20 ppm and/or the 8-hour standard of 9.0 ppm.

While CO transport is limited, it does disperse over time and with distance from the source under normal meteorological conditions. However, under certain extreme meteorological conditions, CO concentrations near congested roadways or intersections may reach unhealthful levels that adversely affect local sensitive receptors (e.g., residents, schoolchildren, the elderly, and hospital patients). Typically, high CO concentrations are associated with roadways or intersections operating at unacceptable levels of service or with extremely high traffic volumes. In areas with high ambient background CO concentration, modeling is recommended to determine a project's effect on local CO levels.

(2) Vehicle Emissions. Long-term air emission impacts are those associated with changes in automobile travel within the City. Mobile source emissions would result from vehicle trips associated with increased vehicular travel. As is true throughout much of the U.S., motor vehicle use is projected to increase substantially in the region. The BAAQMD, local jurisdictions, and other parties responsible for protecting public health and welfare are continually seeking ways of minimizing the air quality impacts of growth and development in order to avoid further exceedances of the air quality standards.

(3) Fugitive Dust. Fugitive dust emissions are generally associated with agriculture operations, demolition, land clearing, exposure of soils to the air, and cut and fill operations. Dust generated during construction varies substantially on a project-by-project basis, depending on the level of activity, the specific operations, and weather conditions.

The U.S. EPA has developed an approximate emission factor for construction-related emissions of total suspended particulate of 1.2 tons per acre per month of activity. This factor assumes a moderate activity level, moderate silt content in soils being disturbed and a semi-arid climate. The California Air Resources Board estimates that 64 percent of construction-related total suspended particulate emissions occur in the form of PM_{10}. Therefore, the emission factors for uncontrolled construction-related PM_{10} emissions are:

- 0.77 tons per acre per month of PM_{10}; or
- 51 pounds per acre per day of PM_{10}.

However, construction emissions can vary greatly depending on the level of activity, the specific operations taking place, the equipment being operated, local soils, weather conditions, and other factors. There are a number of feasible control measures that can be reasonably implemented to significantly reduce PM_{10} emissions from construction. Rather than attempting to provide detailed quantification of anticipated construction emissions from projects, the BAAQMD suggests the following:

The determination of significance with respect to construction emissions should be based on a consideration of the control measures to be implemented. From the BAAQMD's perspective, quantification of emissions is not necessary, although a Lead Agency may elect to do so. If all of the control measures indicated as appropriate, depending on the size of the project, are implemented, then air pollution from emissions from construction activities would be considered a less-than-significant impact.[5]

(4) Odors. Odors are also an important element of local air quality conditions. Specific activities allowed within each of the major general plan land use categories can raise concerns on the part of nearby neighbors. Major sources of odors include restaurants, waste water treatment plants, manufacturing plants, and agricultural operations. Other odor producers include the industrial facilities within the Carquinez Strait region. While sources that generate objectionable odors must comply with air quality regulations, the public's sensitivity to locally produced odors often exceeds regulatory thresholds.

(5) Construction Equipment Exhaust. Construction activities cause combustion emissions from utility engines, heavy-duty construction vehicles, equipment hauling materials to and from construction sites, and motor vehicles transporting construction crews. Exhaust emissions from construction activities vary daily as construction activity levels change. The use of construction equipment results in localized exhaust emissions.

(6) Global Climate Change. The City of Benicia acknowledges that global warming and greenhouse gases are an emerging environmental concern being raised on statewide, national, and global levels. Regional, State, and federal agencies are developing strategies to control pollutant emissions that contribute to global warming. However, neither CEQA nor the CEQA Guidelines mention or provide any methodology for analysis of "greenhouse gases," including CO_2, nor do they provide any significance thresholds. The air quality analysis in the DEIR follows all procedures and requirements of the California Environmental Quality Act (CEQA) and the BAAQMD CEQA Guidelines.

In the absence of standardized criteria for determining the significance of a project's contributions to global warming, the global warming analysis in this section determines the consistency of the Draft Specific Plan with greenhouse gas emission reduction strategies prepared by the California Environmental Protection Agency Climate Action Team. These strategies were identified pursuant to State Executive Order S-3-05 (announced on June 1, 2005), which sets greenhouse gas emission targets in California through 2050 (the order is discussed below in more detail). The substantial compliance of the Draft Specific Plan with these greenhouse gas emission reduction strategies would indicate that the project would have a less-than-significant effect on global warming.

d. Regulatory Framework. The BAAQMD is primarily responsible for regulating air pollution emissions from stationary sources (e.g., factories) and indirect sources (e.g., traffic associated with new development), as well as for monitoring ambient pollutant concentrations. The District's jurisdiction encompasses seven counties—Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara and Napa—and portions of Solano and Sonoma counties. The California Air Resources

[5] Bay Area Air Quality Management District, 1996. *BAAQMD CEQA Guidelines Assessing the Air Quality Impacts of Projects and Plans*. April. (Amended in December 1999.)

Board (ARB) and the U.S. Environmental Protection Agency (EPA) regulate direct emissions from motor vehicles.

(1) Federal Regulations. The Federal 1970 Clean Air Act authorized the establishment of national health-based air quality standards and also set deadlines for their attainment. The Federal Clean Air Act Amendments of 1990 changed deadlines for attaining National Ambient Air Quality Standards as well as the remedial actions required of areas of the nation that exceed the standards. Under the Clean Air Act, State and local agencies in areas that exceed the National Ambient Air Quality Standards are required to develop State Implementation Plans to show how they will achieve the National Ambient Air Quality Standards for O_3 by specific dates.

The Clean Air Act requires that projects receiving federal funds demonstrate conformity to the approved State Implementation Plan and local air quality attainment plan for the region. Conformity with the State Implementation Plan requirements would satisfy the Clean Air Act requirements.

(2) State Regulations. In 1988, the California Clean Air Act required that all air districts in the State endeavor to achieve and maintain California Ambient Air Quality Standards for O_3, CO, SO_2 and NO_2 by the earliest practical date. Plans for attaining California Ambient Air Quality Standards were submitted to the California Air Resource Board by June 30 of the following years: 1991, 1994, 1997, 2000, and 2004. The California Clean Air Act provides districts with new authority to regulate indirect sources and mandates that air quality districts focus particular attention on reducing emissions from transportation and area-wide emission sources. Each district plan is to achieve a 5 percent annual reduction, averaged over consecutive 3-year periods, in district-wide emissions of each nonattainment pollutant or its precursors. Additional physical or economic development within the region would tend to impede the emissions reduction goals of the California Clean Air Act.

The most recent BAAQMD plan for attaining California Ambient Air Quality Standards, the Bay Area 2005 Ozone Strategy, was adopted by the District's Board of Directors on January 4, 2006. The 2005 Ozone Strategy demonstrates how the San Francisco Bay Area will achieve compliance with the State 1-hour air quality standard for ozone and how the region will reduce transport of ozone and ozone precursors to neighboring air basins. The Ozone Strategy also includes stationary source control measures, mobile source control measures and transportation control measures.

The Bay Area Air Quality Management District (Air District) has begun a process to update the Bay Area 2005 Ozone Strategy. The 2007 Ozone Strategy will be prepared in cooperation with the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG). The 2007 Ozone Strategy will review progress achieved in the 2004-2006 period, and establish control measures to be adopted in the 2007-2009 timeframe.

Executive Order S-3-05. On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05, acknowledging the environmental impacts of greenhouse gas emissions on climate change. The Executive Order established the following climate change emission reduction targets for California:

- By 2010, reduce greenhouse gas emissions to 2000 levels
- By 2020, reduce greenhouse gas emissions to 1990 levels

- By 2050, reduce greenhouse gas emission to 80 percent below 1990 levels

It also directed the California Environmental Protection Agency (Cal/EPA) to coordinate efforts among State agencies to meet these targets. As part of this directive, in 2006 the California State Legislature adopted AB 32, the California Global Warming Solutions Act of 2006. AB 32 requires Cal/EPA to lead the evaluation of California's impacts on climate change and identify mitigation strategies to reduce emissions and adaptive measures to minimize adverse effects of climate change.

In response to the Executive Order, Cal/EPA established the Climate Action Team to develop strategies for reducing climate change emissions in the State. In March 2006, Cal/EPA released a document called the *Climate Action Team Report to Governor Schwarzenegger and Legislature*.[6] The Report provides suggested strategies for reducing climate change emissions that would be implemented by State agencies over the next 2 years. It is a guidance document to be used by the identified State agencies in developing Statewide programs for reducing climate change emissions. The strategies in the report are used in this air quality analysis to determine if the Draft Specific Plan would result in a significant impact on global warming.

(3) City of Benicia Lower Arsenal Mixed Use Specific Plan Policies. This section summarizes the Lower Arsenal Mixed Use Specific Plan policies and standards that specifically apply to air quality within the Specific Plan area. Theses policies are summarized as follows:

- *Action 1.1.10.* All development in the Lower Arsenal Mixed Use Area shall be required to record a deed restriction and include provision in any required Covenants, Conditions and Restrictions to notify future owners that this is a heavy industrial and manufacturing area with uses such as the nearby waste water treatment plant and port related uses that operate 24 hours a day and that are uses dependent on the tides and the Strait.

2. Impacts and Mitigation Measures

This section evaluates potential impacts to air quality resulting from implementation of the proposed project. The evaluation of environmental effects presented in this section focuses on consistency with air quality management plans and potential air quality impacts associated with construction emissions, odors, development-related traffic emissions, and emissions of greenhouse gases from multiple sources. Mitigation measures are proposed as appropriate.

a. Criteria of Significance. A significant impact would occur with implementation of the proposed project if it would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard;
- Contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the region is in nonattainment;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

[6] California Environmental Protection Agency, 2006. Op. Cit.

The BAAQMD provides various quantitative thresholds that can be used to better define the above criteria. For ROG, NOx, and PM_{10}, a net increase of 80 pounds per day is considered significant, while for CO, an increase of 550 pounds per day would be considered significant if it leads to or contributes to CO concentrations exceeding the State Ambient Air Quality Standard of 9 ppm averaged over 8 hours and 20 ppm for 1 hour (i.e., if it creates a "hot spot"). Generally, if a project results in an increase in ROG, NOx, or PM_{10} of more than 80 pounds per day, then it would also be considered to contribute considerably to a significant cumulative effect. For projects that would not lead to a significant increase of ROG, NOx, or PM_{10} emissions, the cumulative effect is evaluated based on a determination of the consistency of the project with the regional Clean Air Plan. Impacts from $PM_{2.5}$ emissions have not been analyzed quantitatively as there are no recommended significance thresholds from the BAAQMD.

It should be noted that the emission thresholds were established based on the attainment status of the air basin in regard to air quality standards for specific criteria pollutants. Because the concentration standards were set at a level that protects public health with adequate margin of safety (EPA), these emission thresholds are regarded as conservative and would tend to overstate an individual project's contribution to health risks.

b. Less-than-Significant Impacts. A discussion of several less-than-significant impacts of the proposed project follows.

(1) Clean Air Plan (CAP) Consistency. Implementation of the Draft Specific Plan would generally promote the types of land uses that currently exist within the Plan Area and are anticipated in the General Plan. As discussed in Section IV.A, Land Use, the General Plan designates the majority of the Plan Area as Lower Arsenal Mixed Use. This designation includes residential, live/work, office, retail, public, quasi-public and limited industrial uses. The residential areas along the western half of Jefferson Street are designated Low Density Residential and the Commandant's Quarters and Clocktower area north of Washington Street is designated Public/Quasi-Public. Implementation of the Draft Specific Plan would be consistent with these land use designations. In this way, the proposed project is consistent with growth anticipated under the City's General Plan and falls within the population projections prepared by ABAG. As a result, the project would not conflict with the 2005 Bay Area Ozone Attainment Plan.

(2) Odors Emissions. While offensive odors rarely cause any physical harm, they may be considered a nuisance. Any project with the potential to frequently expose members of the public to objectionable odors would be deemed to have a significant impact. The proposed Lower Arsenal Specific Plan would include the development of residential uses. The Plan Area is located 2,000 feet from the Benicia wastewater treatment plant. This distance falls within the 1 mile screening distance as specified by the BAAQMD. Therefore based on the BAAQMD CEQA Guidelines, a significant odor impact would occur if the plant has had more than one confirmed complaint per year averaged over a 3-year period, or three unconfirmed complaints per year averaged over a 3-year period.

The BAAQMD was contacted to obtain records of odor complaints generated by the Benicia wastewater treatment plant. Based on those records, the treatment plant has received zero (0) confirmed odor complaints over the last three years and zero (0) unconfirmed complaints over the last three years. Therefore, development of residential uses within the Lower Arsenal would be less than significant.

During construction, odors from diesel exhaust may be present, however this would be a short-term impact and no sensitive receptors nearby would be adversely affected. The project therefore would not have the potential to frequently expose members of the public to objectionable odors and would be deemed to have a less-than-significant impact.

(3) Operational Emissions – Long Term Emissions. Long-term air emission impacts would be those associated with changes in permanent usage of the project site. Mobile source emissions would result from vehicle trips associated with the proposed project. The Urban Emission Model (URBEMIS 2002) computer program, which is the most current air quality model available in California for estimating emissions associated with land use development projects, was used to calculate long-term mobile source emissions associated with the proposed project. Trip generation data from Section IV.G, Transportation and Circulation were used as an input to the URBEMIS model. Increases in long-term stationary emissions from natural gas and electricity use within the project site are expected to be negligible when compared with mobile source emissions. Therefore, these emissions were not included in the calculation.

The daily emission increase associated with operation-period vehicle trips generated by the Draft Specific Plan at buildout is identified in Table IV.H-5 for reactive organic gases (ROG) and nitrogen oxides (NOx) (two precursors of ozone) and coarse particulate matter (PM_{10}). The BAAQMD has established thresholds of significance for ozone precursors and fugitive dust of 80 pounds per day. Proposed project emissions are shown in Table IV.H-5. Proposed project emissions would be well below these thresholds of significance for ROG, NOx and PM_{10}; therefore, the proposed project would not have a significant effect on regional air quality.

Table IV.H-5: Project Regional Emissions in Pounds Per Day

	Reactive Organic Gases	Nitrogen Oxides	PM_{10}
Project Emissions	51.83	62.59	32.15
BAAQMD Significance Threshold	80.0	80.0	80.0
Exceed?	**No**	**No**	**No**

Source: LSA Associates, Inc., June 2007.

(4) Operational Emissions - CO Analysis. Vehicular traffic associated with the proposed project would emit carbon monoxide (CO) into the air along roadway segments and nearby intersections. Areas of vehicle congestion can create pockets of high CO concentrations, called "hot spots." Typically, high CO concentrations are associated with roadways or intersections operating at deficient levels of service (LOS) or with extremely high traffic volumes. Table IV.H-6 lists the 1-hour and 8-hour CO concentrations under existing (2007) conditions at 10 intersections in the project area that have the highest potential to have CO hot spots associated with implementation of the Draft Specific Plan. Table IV.H-7 lists the CO concentrations under the Existing (2007) Plus Project conditions. Table IV.H-8 lists the CO concentrations under the future (2030) conditions for the entire study area with and without the project.

Based on the methodology suggested by the U.S. EPA and California Department of Transportation, the higher of the second highest CO concentrations monitored at the nearest air monitoring station in the past 2 years (in this case, 3.9 ppm for the 1-hour period and 3.1 ppm for the 8-hour period), were used as the background CO concentrations.
Tables IV.H-6 and IV.H-7 show that all of the existing and existing plus project 1-hour and 8-hour CO concentrations would be below the federal and State CO standards. The 1-hour CO level would range from 3.9 ppm to 5.9 ppm, much lower than the State standard of 20 ppm and the federal stan-

dard of 35 ppm. The 8-hour CO level would range from 3.1 ppm to 4.5 ppm, also much lower than the State and federal standards of 9 ppm.

Table IV.H-8 shows that all of the future (2025) and future plus project 1-hour and 8-hour CO concentrations would be below the federal and State CO standards. The 1-hour CO level would ranges from 3.9 ppm to 4.5 ppm, much lower than the State standard of 20 ppm and the federal standard of 35 ppm. The 8-hour CO level would range from 3.1 ppm to 3.5 ppm, which is lower than the State standard of 9 ppm.

Therefore, the proposed project would not lead to significant CO impacts, nor would the proposed project, in combination with other cumulative development, lead to CO concentrations that exceed federal or State standards.

(5) Climate Change. As described above, neither CEQA nor the CEQA Guidelines provide any methodology for analysis of "greenhouse gases," including CO_2, nor do they provide any significance thresholds. In the absence of standardized criteria for determining the significance of a project's contributions to global climate change, the analysis in this section determines the consistency of the Draft Specific Plan with greenhouse gas emission reduction strategies identified by the California Environmental Protection Agency Climate Action Team. The consistency of the Draft Specific Plan with these reduction strategies is summarized in Table IV.H-9. As shown in the table, the project would be substantially consistent with the various measures identified by Cal/EPA to reduce greenhouse gas emissions in residential and commercial/industrial development. Therefore, the proposed project would have a less-than-significant impact on global climate change.

c. Significant Impacts. The proposed project would result in the following significant impacts related to air quality as described below.

<u>Impact AIR-1</u>: Demolition and construction period activities could generate significant dust, exhaust, and organic emissions. (S)

(1) Construction Impacts. Development associated with the Lower Arsenal Specific Plan could require excavation, demolition, and grading at the project site at the time specific projects within the Plan Area are constructed. The excavation and grading of soil are construction activities with a high potential for creating air pollutants. In addition to the dust created during demolition and excavation, substantial dust emissions could be created as debris and soil are loaded into trucks for disposal.

After removal of any demolished structures, construction dust would also continue to affect local air quality during construction of the project. Construction activities would also generate exhaust emissions from vehicles/equipment and fugitive particulate matter emissions that would also affect local air quality.

Table IV.H-6: Existing Peak Hour CO Concentrations[a]

Intersection	Receptor Distance to Road Centerline (Meters)	Existing 1-Hour CO Concentration (ppm)	Existing 8-Hour CO Concentration (ppm)	Exceeds State Standards	
				1-Hr	8-Hr
East 5th Street and I-780 WB Ramps	14	4.8	3.7	No	No
	14	4.8	3.7	No	No
	12	4.8	3.7	No	No
	10	4.7	3.7	No	No
East 5th Street and I-780 EB Ramps	12	4.9	3.8	No	No
	12	4.9	3.8	No	No
	10	4.8	3.7	No	No
	10	4.8	3.7	No	No
East 5th Street and Military East	14	5.0	3.9	No	No
	14	4.9	3.8	No	No
	14	4.9	3.8	No	No
	14	4.8	3.7	No	No
East 5th Street and East H Street	8	4.3	3.4	No	No
	8	4.3	3.4	No	No
	8	4.3	3.4	No	No
	8	4.3	3.4	No	No
East 2nd Street and Military East	14	5.9	4.5	No	No
	14	5.6	4.3	No	No
	14	5.5	4.2	No	No
	13	5.4	4.2	No	No
Bayshore Road and Park Road	14	4.9	3.8	No	No
	14	4.6	3.6	No	No
	13	4.6	3.6	No	No
	8	4.6	3.6	No	No
Grant Street and Military East	8	4.4	3.5	No	No
	8	4.3	3.4	No	No
	8	4.3	3.4	No	No
	8	4.3	3.4	No	No
Park Road and Adams Street	8	4.2	3.3	No	No
	8	4.1	3.2	No	No
	8	4.1	3.2	No	No
	8	4.1	3.2	No	No
Park Road and Polk Street	8	4.2	3.3	No	No
	8	4.2	3.3	No	No
	8	4.2	3.3	No	No
	8	4.2	3.3	No	No
Bayshore Road and Adams Street	12	3.9	3.1	No	No
	12	3.9	3.1	No	No
	10	3.9	3.1	No	No
	10	3.9	3.1	No	No

[a] Includes ambient 1-hour concentration of 3.9 ppm and ambient 8-hour concentration of 3.1 ppm. Measured at the Tuolumne Street, Vallejo, CA, AQ Station (Solano County).
Source: LSA Associates, Inc., 2007.

Table IV.H-7: Existing Plus Project Peak Hour CO Concentrations[a]

Intersection	Receptor Distance to Road Centerline (Meters)	Project Related Increase 1-hr/8-hr (ppm)	Without/With Project 1-Hour CO Concentration (ppm)	Without/With Project 8-Hour CO Concentration (ppm)	Exceeds State Standards	
					1-Hr	8-Hr
East 5th Street and I-780 WB Ramps	14	0.2 / 0.2	4.8 / 5.0	3.7 / 3.9	No	No
	14	0.2 / 0.2	4.8 / 5.0	3.7 / 3.9	No	No
	12	0.2 / 0.2	4.8 / 5.0	3.7 / 3.9	No	No
	10	0.2 / 0.1	4.7 / 4.9	3.7 / 3.8	No	No
East 5th Street and I-780 EB Ramps	12	0.5 / 0.4	4.9 / 5.4	3.8 / 4.2	No	No
	12	0.4 / 0.3	4.9 / 5.3	3.8 / 4.1	No	No
	10	0.5 / 0.4	4.8 / 5.3	3.7 / 4.1	No	No
	10	0.3 / 0.2	4.8 / 5.1	3.7 / 3.9	No	No
East 5th Street and Military East	14	0.4 / 0.3	5.0 / 5.4	3.9 / 4.2	No	No
	14	0.5 / 0.4	4.9 / 5.4	3.8 / 4.2	No	No
	14	0.3 / 0.2	4.9 / 5.2	3.8 / 4.0	No	No
	14	0.3 / 0.2	4.8 / 5.1	3.7 / 3.9	No	No
East 5th Street and East H Street	8	0.1 / 0.1	4.3 / 4.4	3.4 / 3.5	No	No
	8	0.0 / 0.0	4.3 / 4.3	3.4 / 3.4	No	No
	8	0.0 / 0.0	4.3 / 4.3	3.4 / 3.4	No	No
	8	0.0 / 0.0	4.3 / 4.3	3.4 / 3.4	No	No
East 2nd Street and Military East	14	0.0 / 0.0	5.9 / 5.9	4.5 / 4.5	No	No
	14	0.0 / 0.0	5.6 / 5.6	4.3 / 4.3	No	No
	14	0.1 / 0.1	5.5 / 5.6	4.2 / 4.3	No	No
	13	0.0 / 0.0	5.4 / 5.4	4.2 / 4.2	No	No
Bayshore Road and Park Road	14	0.0 / 0.0	4.9 / 4.9	3.8 / 3.8	No	No
	14	0.0 / 0.0	4.6 / 4.6	3.6 / 3.6	No	No
	13	0.0 / 0.0	4.6 / 4.6	3.6 / 3.6	No	No
	8	0.0 / 0.0	4.6 / 4.6	3.6 / 3.6	No	No
Grant Street and Military East	8	0.4 / 0.2	4.4 / 4.8	3.5 / 3.7	No	No
	8	0.5 / 0.3	4.3 / 4.8	3.4 / 3.7	No	No
	8	0.4 / 0.3	4.3 / 4.7	3.4 / 3.7	No	No
	8	0.4 / 0.3	4.3 / 4.7	3.4 / 3.7	No	No
Park Road and Adams Street	8	0.2 / 0.2	4.2 / 4.4	3.3 / 3.5	No	No
	8	0.3 / 0.3	4.1 / 4.4	3.2 / 3.5	No	No
	8	0.3 / 0.3	4.1 / 4.4	3.2 / 3.5	No	No
	8	0.2 / 0.2	4.1 / 4.3	3.2 / 3.4	No	No
Park Road and Polk Street	8	0.2 / 0.2	4.2 / 4.4	3.3 / 3.5	No	No
	8	0.2 / 0.2	4.2 / 4.4	3.3 / 3.5	No	No
	8	0.2 / 0.2	4.2 / 4.4	3.3 / 3.5	No	No
	8	0.2 / 0.2	4.2 / 4.4	3.3 / 3.5	No	No
Bayshore Road and Adams Street	12	0.0 / 0.0	3.9 / 3.9	3.1 / 3.1	No	No
	12	0.0 / 0.0	3.9 / 3.9	3.1 / 3.1	No	No
	10	0.0 / 0.0	3.9 / 3.9	3.1 / 3.1	No	No
	10	0.0 / 0.0	3.9 / 3.9	3.1 / 3.1	No	No

[a] Includes ambient 1-hour concentration of 3.9 ppm and ambient 8-hour concentration of 3.1 ppm. Measured at the Tuolumne Street, Vallejo, CA, AQ Station (Solano County).

Source: LSA Associates, Inc., 2007.

Table IV.H-8: Future (2025) Plus Project Peak Hour CO Concentrations[a]

Intersection	Receptor Distance to Road Centerline (Meters)	Project Related Increase 1-hr/8-hr (ppm)	Without/With Project 1-Hour CO Concentration (ppm)	Without/With Project 8-Hour CO Concentration (ppm)	Exceeds State Standards	
					1-Hr	8-Hr
East 5th Street and I-780 WB Ramps	14	0.0 / 0.0	4.2 / 4.2	3.3 / 3.3	No	No
	14	0.0 / 0.0	4.2 / 4.2	3.3 / 3.3	No	No
	12	0.0 / 0.0	4.2 / 4.2	3.3 / 3.3	No	No
	10	0.0 / 0.0	4.2 / 4.2	3.3 / 3.3	No	No
East 5th Street and I-780 EB Ramps	12	0.2 / 0.2	4.2 / 4.4	3.3 / 3.5	No	No
	12	0.1 / 0.1	4.2 / 4.3	3.3 / 3.4	No	No
	10	0.1 / 0.1	4.2 / 4.3	3.3 / 3.4	No	No
	10	0.1 / 0.1	4.2 / 4.3	3.3 / 3.4	No	No
East 5th Street and Military East	14	0.1 / 0.1	4.2 / 4.3	3.3 / 3.4	No	No
	14	0.1 / 0.1	4.2 / 4.3	3.3 / 3.4	No	No
	14	0.1 / 0.1	4.2 / 4.3	3.3 / 3.4	No	No
	14	0.1 / 0.1	4.2 / 4.3	3.3 / 3.4	No	No
East 5th Street and East H Street	8	0.0 / 0.0	4.0 / 4.0	3.2 / 3.2	No	No
	8	0.0 / 0.0	4.0 / 4.0	3.2 / 3.2	No	No
	8	0.0 / 0.0	4.0 / 4.0	3.2 / 3.2	No	No
	8	0.0 / 0.0	4.0 / 4.0	3.2 / 3.2	No	No
East 2nd Street and Military East	14	0.0 / 0.0	4.5 / 4.5	3.5 / 3.5	No	No
	14	0.0 / 0.0	4.4 / 4.4	3.5 / 3.5	No	No
	14	0.0 / 0.0	4.4 / 4.4	3.5 / 3.5	No	No
	13	0.0 / 0.0	4.4 / 4.4	3.5 / 3.5	No	No
Bayshore Road and Park Road	14	0.0 / 0.0	4.3 / 4.3	3.4 / 3.4	No	No
	14	0.0 / 0.0	4.2 / 4.2	3.3 / 3.3	No	No
	13	0.0 / 0.0	4.2 / 4.2	3.3 / 3.3	No	No
	8	0.0 / 0.0	4.2 / 4.2	3.3 / 3.3	No	No
Grant Street and Military East	8	0.1 / 0.0	4.0 / 4.1	3.2 / 3.2	No	No
	8	0.1 / 0.0	4.0 / 4.1	3.2 / 3.2	No	No
	8	0.1 / 0.0	4.0 / 4.1	3.2 / 3.2	No	No
	8	0.2 / 0.1	3.9 / 4.1	3.1 / 3.2	No	No
Park Road and Adams Street	8	0.1 / 0.1	3.9 / 4.0	3.1 / 3.2	No	No
	8	0.1 / 0.1	3.9 / 4.0	3.1 / 3.2	No	No
	8	0.1 / 0.1	3.9 / 4.0	3.1 / 3.2	No	No
	8	0.1 / 0.1	3.9 / 4.0	3.1 / 3.2	No	No
Park Road and Polk Street	8	0.1 / 0.1	3.9 / 4.0	3.1 / 3.2	No	No
	8	0.1 / 0.1	3.9 / 4.0	3.1 / 3.2	No	No
	8	0.1 / 0.1	3.9 / 4.0	3.1 / 3.2	No	No
	8	0.1 / 0.1	3.9 / 4.0	3.1 / 3.2	No	No
Bayshore Road and Adams Street	12	0.0 / 0.0	3.9 / 3.9	3.1 / 3.1	No	No
	12	0.0 / 0.0	3.9 / 3.9	3.1 / 3.1	No	No
	10	0.0 / 0.0	3.9 / 3.9	3.1 / 3.1	No	No
	10	0.0 / 0.0	3.9 / 3.9	3.1 / 3.1	No	No

[a] Includes ambient 1-hour concentration of 3.9 ppm and ambient 8-hour concentration of 3.1 ppm. Measured at the Tuolumne Street, Vallejo, CA, AQ Station (Solano County).

Source: LSA Associates, Inc., 2007.

Table IV.H-9: Consistency of the Draft Specific Plan with State Greenhouse Gas Emission Reduction Strategies

State Strategy to Reduce Greenhouse Gas Emissions	Would Project Substantially Include Strategy?
Meet vehicle climate change standards (including standards for heavy-duty vehicles).	Yes. Vehicle climate change standards are enforced by the California Air Resources Board. All vehicles that enter the Plan Area would be required to meet these standards.
Reduce use of hydrofluorocarbons.	Yes. When the California Air Resources Board adopts standards for hydrofluorocarbons, these standards will be applied to all consumer goods.
Achieve 50 percent State-wide recycling goal; recycle as much as possible.	Yes. Recycling bins would be placed throughout the Plan Area, including in all multi-family units. High levels of recycling would be required by Draft Specific Plan Actions 6.12.6 and 6.2.7.
Protect and plant trees in urban settings (urban forestry).	Yes. Significant trees, including the grove of heritage cork oak trees on Jefferson Ridge, would be permanently protected as part if the Draft Specific Plan. Action 1.6.3 would permit the removal of large trees only if a property is unduly constrained from development by their retention, and if the trees are replaced at a higher ratio elsewhere on the site. Trees would be planted along most streets in the Plan Area
Protect open space and forested areas.	Yes. Key open spaces in the Plan Area, including Officers' Square, and the hillside north of Adams Street would largely be maintained as open space.
Increase water use efficiency as much as practicable.	Yes. Action 6.2.1 would provide for the efficient use of water.
Increase energy efficiency by 20 percent beyond Title 24 requirements.	Yes. Action 1.1.8 would establish a green building program in the Plan Area. This program would encourage the construction of energy-efficient buildings that exceed Title 24 standards.
Use energy-efficient appliances.	Yes. Energy-efficient appliances would be required, per State regulations.
Encourage high-density mixed use projects.	Yes. The Draft Specific plan would result in the development of higher-density mixed-use projects in the Lower Arsenal. The patterns of development envisioned in the Draft Specific Plan would encourage the use of alternative transportation modes.
Encourage green construction.	Yes. Action 1.1.8 would establish a green building program in the Plan Area.
Encourage the use of solar energy.	Yes. Action 1.1.8 would establish a green building program that would promote the use of solar receptors in the Plan Area.
Impose anti-idling requirements on diesel vehicles.	Yes. Bay Area Air Quality Management District (BAAQMD) guidelines would prohibit unnecessary idling.
Implement measures to reduce emissions from Transportation Refrigerator Units (TRUs)	Not applicable. TRUs are not planned as part of the Draft Specific Plan.

Source: State of California Environmental Protection Agency, 2006. Climate Action Team Report to Governor Schwarzenegger and the California Legislature. March.

Construction activities are also a source of organic gas emissions. Solvents in adhesives, non-water-base paints, thinners, some insulating materials and caulking materials would evaporate into the atmosphere and would participate in the photochemical reaction that creates urban ozone. Asphalt used in paving is also a source of organic gases for a short time after its application.

The effects of construction activities would be increased dustfall and locally elevated levels of PM_{10} downwind of construction activity. Construction dust would be generated at levels that would create an annoyance to nearby properties.

Mitigation Measure AIR-1: Consistent with guidance from the BAAQMD, the following actions shall be required of construction contracts and specifications for individual development projects:

Demolition. The following controls shall be implemented during demolition:

- Water during demolition of structures and break-up of pavement to control dust generation;
- Cover all trucks hauling demolition debris from the site; and
- Use dust-proof chutes to load debris into trucks whenever feasible.

Construction. The following controls shall be implemented at all construction sites:

- Water all active construction areas at least twice daily and more often during windy periods; active areas adjacent to existing land uses shall be kept damp at all times, or shall be treated with non-toxic stabilizers to control dust;
- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet of freeboard;
- Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites;
- Sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas at construction sites; water sweepers shall vacuum up excess water to avoid runoff-related impacts to water quality;
- Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets;
- Apply non-toxic soil stabilizers to inactive construction areas;
- Enclose, cover, water twice daily, or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.);
- Limit traffic speeds on unpaved roads to 15 mph;
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways;
- Replant vegetation in disturbed areas as quickly as possible.
- Install base rock at entryways for all exiting trucks, and wash off the tires or tracks of all trucks and equipment in designated areas before leaving the site; and
- Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 mph.

Implementation of this mitigation measure would reduce construction period air quality impacts to a less-than-significant level. (LTS)

Impact AIR-2: The proposed project could expose future residents within the Lower Arsenal Specific Plan to potentially high cancer risks from exposure to diesel emissions from the adjacent port operations. (S)

Implementation of the Draft Specific Plan would not result in any new sources of toxic air contaminants; however, the plan would locate sensitive receptors near major sources of toxic air contaminants. The project would have the potential to expose sensitive receptors or the general public to substantial levels of toxic air contaminants related to activities associated with the Port of Benicia.

Port activities are a major source of diesel particulate. Diesel particulate matter (PM) has been identified by the ARB as a toxic air contaminant and represents 70 percent of the known potential cancer risk from air toxics in California. Diesel PM is an important contributor to particulate matter pollution. Particulate matter exposure is associated with premature mortality and health effects such as asthma exacerbation and hospitalization due to aggravating heart and lung disease.[7]

The primary air pollutant associated with port operations is directly emitted diesel particulate. Port-related activities also result in emissions that form ozone and secondary particulate in the atmosphere. Port activities include five source categories that produce diesel emissions. The emission sources associated with ports include diesel engine-powered ocean-going ships, harbor craft, cargo handling equipment, trucks, and locomotives. The size and concentration of these diesel engines makes ports one of the biggest sources of diesel PM in the state.[8]

Currently, the ARB is in the process of evaluating the various port-related emission sources from the standpoint of existing emissions, growth forecasts, new control options, regional air quality impacts, and localized health risk. A number of public processes are underway to address various aspects of these issues. Currently the ARB does not have a specific recommendation for the separation between new sensitive land uses and ports; however, the ARB expects locations downwind of ports to be substantially impacted.

Winds in the vicinity of the specific plan are generally from the west and northwest; such winds would not transmit particulate matter from the Port into the Plan Area. However, due to the directional variation of winds in the area, Port emissions could significantly affect future residential uses within the Specific Plan area.

The BAAQMD has determined that any project with the potential to expose sensitive receptors (including residential areas) or the general public to substantial levels of toxic air contaminants would be deemed to have a significant impact. According to the BAAQMD, proposed development projects that have the potential to expose the public to toxic air contaminants in excess of the following thresholds would be considered to have a significant air quality impact: 1) probability of contracting cancer for the Maximally Exposed Individual (MEI) exceeds 10 in 1 million, 2) Ground-level concentrations of non-carcinogenic toxic air contaminants would result in a Hazard Index greater than 1 for the MEI.

Specific development projects associated with the Draft Specific Plan are unknown at this time. Implementation of the following mitigation measure would ensure that future residents of the Plan Area would not be exposed to toxic air contaminants in excess of BAAQMD thresholds.

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[7] California Air Resources Board, 2005. *Air Quality and Land Use Handbook: A Community Health Perspective.* April.

[8] Ibid.

Mitigation Measure AIR-2: To determine if a specific development proposal would expose sensitive receptors to toxic air contaminants in excess of the BAAQMD significance criteria, the project proponent of a residential project shall coordinate with the BAAQMD to prepare a health risk assessment specific to the development parcel proposed for residential use. The assessment shall incorporate emissions sources from activities associated with the Port of Benicia. Residential sites that are determined to exceed a probability of contracting cancer for the Maximally Exposed Individual (MEI) of 10 in 1 million or have ground-level concentrations of non-carcinogenic toxic air contaminants that would result in a Hazard Index greater than 1 for the MEI shall incorporate interior air filtration systems that would reduce the cancer risk or hazard index to below the BAAQMD significance criteria. (LTS)

d. Projects, Criteria Pollutants and Public Health. Despite great progress in improving air quality, approximately 146 million people nationwide lived in counties with pollution levels above the National Ambient Air Quality Standards (NAAQS) in 2002. Out of the 230 nonattainment areas identified during the 1990 Clean Air Act Amendment designation process, 124 areas remain as nonattainment today. In these nonattainment areas, however, the severity of air pollution episodes has decreased. Air quality in the San Francisco Bay Area Air Basin in the past 20 years has improved steadily and dramatically, even with the tremendous increase in population and vehicles and other sources.

As shown in Table IV.H-2, long term exposure to elevated levels of criteria pollutants could result in potential health effects. However, as stated in the thresholds of significance, emission thresholds established by the air district are used to manage total regional emissions within an air basin, based on the air basin attainment status for criteria pollutants. These emission thresholds were established for individual projects (or, in this case, a proposed Specific Plan) that would contribute to regional emissions and pollutant concentrations that may affect or delay the projected attainment target year for certain criteria pollutants.

Because of the conservative nature of the thresholds and the basin-wide context of individual project emissions, there is no direct correlation of a single plan or project to localized health effects. One individual plan or project having emissions exceeding a threshold does not necessarily result in adverse health effects for residents in the project vicinity. This condition is especially true when the criteria pollutants exceeding thresholds are those with regional effects, such as ozone precursors like NOx and ROG.

Based on the above discussion, the potential for an individual plan or project to significantly deteriorate regional air quality or contribute to significant health risk is small, even if the emission thresholds are exceeded. Because of the overall improvement trend on air quality in the air basin, it is unlikely the regional air quality or health risk would worsen from the current condition due to emissions from an individual plan or project.