

## 4.3 AIR QUALITY

This section, based on an analysis completed by Illingworth and Rodkin, examines the degree to which the proposed project may result in significant adverse changes to air quality. Both short-term construction emissions occurring from activities such as site grading, as well as long-term effects related to the ongoing operation of the proposed project are discussed. The analysis contained herein focuses on air pollution from two perspectives: daily emissions and pollutant concentrations. “Emissions” refers to the actual quantity of pollutant, measured in pounds per day. “Concentrations” refers to the amount of pollutant material per volumetric unit of air. Concentrations are measured in parts per million (ppm) or micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ).

### *A. Regulatory Framework*

The federal Clean Air Act (CAA) governs air quality in the United States. In addition to being subject to federal requirements, air quality in California is also governed by more stringent regulations under the California CAA. At the federal level, the United States Environmental Protection Agency (EPA) administers the CAA. The California CAA is administered by the California Air Resources Board (CARB) at the State level and by the Air Quality Management Districts at the regional and local levels. The Bay Area Air Quality Management District (BAAQMD) regulates air quality at the regional level, which includes the nine-county Bay Area.

#### **1. United States Environmental Protection Agency**

The EPA is responsible for enforcing the federal CAA. The EPA is also responsible for establishing the National Ambient Air Quality Standards (NAAQS). The NAAQS are required under the 1977 federal CAA and subsequent amendments. The EPA regulates emission sources that are under the exclusive authority of the federal government, such as vehicles, aircraft, ships and locomotives. The agency has jurisdiction over emission sources outside State waters (e.g. beyond the outer continental shelf) and establishes various emission standards, including those for vehicles sold in states other than California. Automobiles sold in California must meet the stricter emission standards established by the CARB.

#### **2. California Air Resources Board**

In California, the CARB, which is part of the California Environmental Protection Agency, is responsible for meeting the State requirements of the federal CAA, administering the California CAA, and establishing the California Ambient Air Quality Standards (CAAQS). The California CAA, as amended in 1992, requires all air districts in the State to endeavor to achieve and maintain the CAAQS. The CAAQS are generally more stringent than the corresponding federal standards

and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride and visibility reducing particles. The CARB regulates mobile air pollution sources, such as motor vehicles. The agency is responsible for setting emission standards for vehicles sold in California and for other emission sources, such as consumer products and certain off-road equipment. The CARB established passenger vehicle fuel specifications, which became effective in 1996. CARB oversees the functions of local air pollution control districts and air quality management districts, which in turn administer air quality activities at the regional and county level.

CARB published the *Air Quality and Land Use Handbook* in 2005 (CARB 2005) to providing guidance intended to encourage local land use agencies to consider the risks from air pollution prior to approving projects where new sensitive receptors (e.g. homes or daycare centers) are sited near sources of air pollution. The primary purpose of the document is to highlight the potential health impacts associated with proximity to common air pollution sources, so that those issues are considered in the planning process. Common air pollution sources include land uses near freeways, truck distribution centers, dry cleaners, gasoline dispensing stations, and other air pollution sources. Examples of CARB siting recommendations are as follows:

- ◆ Avoid siting new sensitive land uses within 500 feet of a freeway.
- ◆ Avoid siting new sensitive land uses within 1,000 feet of truck distribution centers (accommodating 100 or more trucks per day).
- ◆ Avoid siting new sensitive land uses within 300 feet of any dry cleaning operation (500 feet for large operations).

These "advisory" recommendations are based primarily on modeling information generic to the State as a whole and are not entirely reflective of conditions in Sonoma County. Siting of new sensitive land uses within these recommended distances may be possible, but only after site-specific studies are conducted to identify the actual health risks. CARB acknowledges that land use agencies have to balance other siting considerations such as housing and transportation needs, economic development priorities and other quality of life issues.

### **3. California Greenhouse Gas Regulations**

California first addressed climate change in 1988 with the passage of AB 4420 directing the California Energy Commission to study global warming impacts to the state and develop an inventory of GHG emission sources. California began adopting regulations to reduce GHG emissions following the passage of Assembly Bill 1493 in 2002, also known as the Pavley Bill. This legislation directed CARB to adopt regulations that achieve the maximum feasible and cost effective reduction in GHG emissions from motor vehicles.

In 2005, the Governor of California issued Executive Order S-3-05, which included GHG emission reduction targets. To meet these targets, the Governor directed State agencies to develop a Climate Action Plan. A Climate Action Team, led by the Secretary of the California EPA, implements the global warming emission reduction programs identified in the Climate Action Plan and reports on progress made toward meeting the Governor's GHG emission targets.

In 2006, the Governor of California signed AB 32, the Global Warming Solutions Act, into legislation. This bill requires that California cap its GHG emissions at 1990 levels by 2020. The legislation requires that CARB establish a program for statewide GHG emissions reporting, as well as monitoring and enforcement of that program. CARB is also required to adopt rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emission reductions.

To meet these regulatory requirements, CARB published a list of discrete GHG emissions reduction measures that can be implemented immediately. In addition, CARB's Early Action Plan identified regulations and measures that could be implemented in the near future to reduce GHG emissions.

CARB is targeting all sources of GHG emissions. The main measures to reduce GHG emissions are contained in the final AB32 Scoping Plan. The plan includes a range of GHG reduction actions. Central to the draft plan is a cap and trade program covering 85 percent of the State's emissions. This program would be developed in conjunction with the Western Climate Initiative, comprised of seven states and three Canadian provinces, to create a regional carbon market. The draft plan also proposes that utilities produce a third of their energy from renewable sources such as wind, solar and geothermal, and proposes to expand and strengthen existing energy efficiency programs and building and appliance standards. The draft plan also includes full implementation of the Pavley standards to provide a wide range of less polluting and more efficient cars and trucks to consumers who will save on operating costs through reduced fuel use. It also calls for development and implementation of the Low Carbon Fuel Standard, which will require oil companies to make cleaner domestically-produced fuels. The final draft of the plan was recently adopted (in December 2008). CARB has now begun to implement the plan, mostly through rulemaking, over the next two-year period.

California Senate Bill 97, which was signed into law in 2007, acknowledges that climate change is an important environmental issue that requires analysis under CEQA. The bill directs the State to prepare, develop, and transmit to State resource agencies guidelines for feasible mitigation of GHG emissions or the effects of GHG emissions. The resource agencies are required to adopt these guidelines by 2010.

Pursuant to Senate Bill 97, the Governor's Office of Planning and Research (OPR) is in the process of developing CEQA guidelines addressing GHGs. OPR is required to "prepare, develop, and transmit" the guidelines to the Resources Agency on or before July 1, 2009. In April 2009, OPR published draft guidelines for addressing climate change through CEQA. OPR recommends that each public agency develop an approach to addressing GHG emissions that is based on best available information. The approach includes three basic steps: (1) identify and quantify emissions; (2) assess the significance of the emissions; and (3) if emissions are significant, identify mitigation measures or alternatives that will reduce the impact to a less than significant level. The draft guidelines also encourage agencies to determine if the project would conflict with adopted plans or regulations adopted for the purpose reducing the emissions of greenhouse gasses. At this time, the City of Petaluma has not identified GHG significance thresholds.

Recently, California enacted legislation (SB 375) to expand the efforts of AB 32 by controlling indirect GHG emissions caused by urban sprawl. SB 375 would develop emissions-reduction goals around which regions can apply to planning activities. SB 375 provides incentives for local governments and developers to implement new conscientiously planned growth patterns. This includes incentives for creating attractive, walkable and sustainable communities and revitalizing existing communities. The legislation also allows developers to bypass certain environmental reviews under the CEQA if they build projects consistent with the new sustainable community strategies. Development of more alternative transportation options that would reduce vehicle trips and miles traveled along with traffic congestion would be encouraged. SB 375 enhances CARB's ability to reach the AB 32 goals by directing the agency to develop regional GHG emission reduction targets to be achieved from the transportation sector for 2020 and 2035. CARB would work with the metropolitan planning organizations (e.g., Metropolitan Transportation Commission) to align their regional transportation, housing and land-use plans to reduce vehicle miles traveled and demonstrate the region's ability to attain its greenhouse gas reduction targets. A similar process is used to reduce transportation emissions of ozone precursor pollutants and CO.

#### **4. National and State Ambient Air Quality Standards**

As required by the federal CAA, the NAAQS have been established for six major air pollutants: carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), ozone (O<sub>3</sub>), respirable particulate matter (PM<sub>10</sub>), fine particulate matter (PM<sub>2.5</sub>), sulfur oxides (SO<sub>x</sub>), and lead. Pursuant to the California CAA, the State of California has also established ambient air quality standards, known as the CAAQS. These standards are generally more stringent than the corresponding federal standards and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride and visibility reducing particles.

Both State and federal standards are summarized in Table 4.3-1. The "primary" standards have been established to protect the public health. The "secondary" standards are intended to protect the nation's welfare and account for air pollutant effects on soil, water, visibility, materials, vegetation

TABLE 4.3-1 CALIFORNIA AND NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards	National Standards <sup>a</sup>	
			Primary <sup>b,c</sup>	Secondary <sup>d</sup>
Ozone	8-hour	0.070 ppm	0.075 ppm	—
	1-hour	0.09 ppm	—	Same as primary
Carbon Monoxide	8-hour	9 ppm	9 ppm	—
	1-hour	20 ppm	35 ppm	—
Nitrogen Dioxide	Annual	—	0.053 ppm	Same as primary
	1-hour	0.18 ppm	—	—
Sulfur Dioxide	Annual	—	0.03 ppm	—
	24-hour	0.04 ppm	0.14 ppm	—
	3-hour	—	—	0.5 ppm
	1-hour	0.25 ppm	—	—
PM <sub>10</sub>	Annual	20 µg/m <sup>3</sup>	—	Same as primary
	24-hour	50 µg/m <sup>3</sup>	150 µg/m <sup>3</sup>	Same as primary
PM <sub>2.5</sub>	Annual	12 µg/m <sup>3</sup>	—	—
	24-hour	—	35 µg/m <sup>3</sup>	—
Lead	Calendar quarter	—	1.5 µg/m <sup>3</sup>	Same as primary
	30-day avg.	1.5 µg/m <sup>3</sup>	—	—
Sulfates	24-hour	25 µg/m <sup>3</sup>	—	—
Hydrogen Sulfide	1-hour	0.03 ppm	—	—
Vinyl Chloride	24-hour	0.01 ppm	—	—
Visibility Reducing Particles	Insufficient amount to produce an extinction coefficient of 0.23 per kilometer-visibility of 10 miles or more due to particles when the relative humidity is less than 70%		—	—

<sup>a</sup> Standards, other than for ozone and those based on annual averages, are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.

<sup>b</sup> Concentrations are expressed first in units in which they were promulgated. Equivalent units given in parenthesis.

<sup>c</sup> Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health. Each state must attain the primary standards no later than three years after that State's implementation plan is approved by the EPA.

<sup>d</sup> Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

Source: Ilingworth and Rodkin, 2008.

and other aspects of the general welfare. The use of the NAAQS or CAAQS is a function of the project approval process. Because the CAAQS are more stringent than the NAAQS, the CAAQS are used as the comparative standard in the analysis contained in this report.

#### **5. Bay Area Air Quality Management District**

In 1955, the California Legislature created the BAAQMD. The agency is primarily responsible for assuring that the national and State ambient air quality standards are attained and maintained in the Bay Area. The BAAQMD is also responsible for adopting and enforcing rules and regulations concerning air pollutant sources, issuing permits for stationary sources of air pollutants, inspecting stationary sources of air pollutants, responding to citizen complaints, monitoring ambient air quality and meteorological conditions, awarding grants to reduce motor vehicle emissions, conducting public education campaigns, as well as many other activities. The BAAQMD has jurisdiction over much of the nine-county Bay Area counties, including portions of Sonoma County.

BAAQMD Regulation 7 places general limitations on odorous substances, and specific emission limitations on certain odorous compounds such as mercaptans and phenolic compounds. The regulation applies when and if the BAAQMD receives validated odor complaints.

#### **6. City of Petaluma General Plan**

The City's General Plan 2025 Natural Environment section includes a subsection containing air quality policies and programs that seek to maintain or improve Petaluma's air quality. These policies are identified in Table 4.3-2.

Greenhouse gases were discussed in the General Plan 2025 and were analyzed in a revision to the Draft EIR in November 2007.<sup>1</sup>

The City of Petaluma has undertaken several steps to reduce GHG emissions, which would also reduce criteria air pollutant emissions. In 2002, the City Council adopted a resolution committing to participate in the Cities for Climate Protection. This committed the City to reducing GHG emissions through the Cities for Climate Protection program approach that requires the City to:

- ◆ Prepare a GHG emissions inventory and forecast.
- ◆ Establish GHG emissions reduction targets.
- ◆ Develop a Climate Action Plan to meet GHG emission reduction targets.
- ◆ Implement the plan and monitor progress.

---

<sup>1</sup> Petaluma General Plan 2025. Air Quality – Greenhouse Gas Emissions Section Revised Draft Environmental Impact Report. State Clearinghouse No. 2004082065. Prepared for the City of Petaluma by Winkler & Kelly. November 2007. Accessed online at <http://cityofpetaluma.net/genplan/deir.html>, May 21, 2009.

TABLE 4.3-2 **PETALUMA GENERAL PLAN POLICIES — AIR QUALITY**

Policy Number	Policy
<b>General Plan 2025</b>	
<i>The Natural Environment Element</i>	
4-P-7	Reduce motor vehicle related air pollution.
4-P-7(A)	Enforce land use and transportation strategies described in Chapter 1: Land Use and Chapter 5: Mobility that promote use of alternatives to the automobile for transportation, including walking, bicycling, bus transit, and carpooling.
4-P-9	Require a percentage of parking spaces in large parking lots or garages to provide electrical vehicle charging facilities.
4-P-12	Prohibit new drive-thru food and service facilities with the exception of vehicle serving businesses, such as car wash and oil/lube, and limit expansion of the drive-thru components of existing facilities which increase idling vehicles.
4-P-13	Require development of traffic roundabouts, where feasible, as an alternative to a traffic signal, to reduce idling vehicles.
4-P-15	Improve air quality by reducing emissions from stationary point sources of air pollution (e.g. equipment at commercial and industrial facilities) and stationary area sources (e.g. wood-burning fireplaces & gas powered lawnmowers) which cumulatively emit large quantities of emissions.
4-P-15(A)	Continue to work with the Bay Area Air Quality Management District to achieve emissions reductions for non attainment pollutants; including carbon monoxide, ozone, and PM <sub>10</sub> , by implementation of air pollution control measures as required by State and federal statutes. <i>The BAAQMD's CEQA Guidelines should be used as the foundation for the City's review of air quality impacts under CEQA.</i>
4-P-15(B)	Continue to use Petaluma's development review process and the California Environmental Quality Act (CEQA) regulations to evaluate and mitigate the local and cumulative effects of new development on air quality.
4-P-15(C)	Continue to require development projects to abide by the standard construction dust abatement measures included in BAAQMD's CEQA Guidelines.
4-P-15(D)	Reduce emissions from residential and commercial uses by requiring the following: <ul style="list-style-type: none"> <li>◆ Compliance with or exceed requirements of CCR Title 24 for new residential and commercial buildings;</li> <li>◆ Incorporation of passive solar building design and landscaping conducive to passive solar energy use for both residential and commercial uses;</li> <li>◆ Encourage the use of battery-powered, electric, or other similar equipment that does not impact local air quality for non-residential maintenance activities.</li> </ul>
4-P-16	To reduce combustion emissions during construction and demolition phases, the contractor of future individual projects shall encourage the inclusion in construction contracts the following requirements or measures shown to be equally effective: <ul style="list-style-type: none"> <li>◆ Maintain construction equipment engines in good condition and in proper tune per manufacturer's specification for the duration of construction;</li> <li>◆ Minimize idling time of construction related equipment, including heavy-duty equipment, motor vehicles, and portable equipment;</li> <li>◆ Use alternative fuel construction equipment (i.e. compressed natural gas, liquid petroleum</li> </ul>

TABLE 4.3-2 **PETALUMA GENERAL PLAN POLICIES — AIR QUALITY (CONTINUED)**

Policy Number	Policy
	gas, and unleaded gasoline); <ul style="list-style-type: none"> <li>◆ Use diesel equipment that meets the ARB’s 2000 or newer certification standard for off-road heavy-duty diesel engines;</li> <li>◆ Phase construction of the project;</li> <li>◆ Limit the hours of operation of heavy duty equipment.</li> </ul>
4-P-18	Develop and adopt local energy standards that would result in less energy consumption than standards set by the California Energy Commission’s (CEC) Title 24 or updates thereto.
	A. Identify and implement energy conservation measures that are appropriate for public buildings and facilities, such as: <ul style="list-style-type: none"> <li>◆ Schedule energy efficiency “tune-ups” of existing buildings and facilities.</li> <li>◆ Institute a lights-out-at-night policy in all public buildings where feasible.</li> <li>◆ Continue to retrofit older lighting fixtures in City facilities until all buildings have been upgraded.</li> </ul>
4-P-18(A)	<ul style="list-style-type: none"> <li>◆ Where new traffic signals or crosswalk signals are installed, or existing signals are upgraded, continue to use LED bulbs or other equivalent efficient technology that may develop.</li> <li>◆ Evaluate the possibility of decreasing the average daily time streets lights are on.</li> <li>◆ Periodically evaluate the efficiency of potable and sewer pumping facilities and identify measures to improve pumping efficiency.</li> <li>◆ Encourage the County of Sonoma to upgrade existing, inefficient facilities which serve Petaluma (e.g. potable water pumping facilities)</li> </ul>
4-P-19	Encourage use and development of renewable or nontraditional sources of energy.
4-P-19 (B)	Implement green building code to allow use of alternative building materials and methods.
4-P-19(D)	Consider the feasibility of requiring a percentage of new development to meet 50% of their energy needs from fossil fuel alternatives (e.g. solar panels, etc.).
4-P-20	Continue to participate in undergrounding of public utility lines; whenever appropriate, require conversion of overhead lines to underground in conjunction with public and private projects.
4-P-26	Implement all measures identified in the municipal Climate Action Plan to meet the municipal target set in Resolution 2005-118 (20% below 2000 levels by 2010).
4-P-27	The City shall prepare a Community Climate Action Plan to identify and prioritize programs, projects, and procedural policies that will help the City achieve the community greenhouse gas emission goals of Resolution 2005-118 (25% below 1990 levels by 2015).
4-P-28	Prepare a feasibility report for the City of Petaluma forming a Community Choice Aggregation (through AB 117, permits any city or county to aggregate the electric loads of residents, businesses and municipal facilities to facilitate the purchase and sale of electrical energy) as a way of supplying renewable energy to the community.
4-P-31	Provide information and tips on reducing greenhouse gas emissions to the community.

Source: City of Petaluma General Plan 2025, May 2008.

In 2005, the City established GHG emissions reduction targets of 25 percent below 1990 levels by 2015 for community emissions and 20 percent below 2000 levels by 2010 for municipal operations. The City's reduction targets are more stringent than those passed by the State.

In the revised Draft EIR of November 2007, the following two significance criteria were used to assess the impacts of GHG emissions:

Impacts of buildout of the proposed General Plan were judged to be significant if they:

- ◆ Resulted in community greenhouse gas emission levels which exceeded pre-project levels by a significant margin.
- ◆ Conflicted with Assembly Bill 32 and its governing regulations.

The discussion concluded in Impact 3.10-6 that was determined to be significant and unavoidable. *"It cannot be determined to a reasonable degree of certainty that buildout under the General Plan will not result in a cumulatively considerable incremental contribution to the significant cumulative impact of global climate change."*

It should be noted that the project as proposed in this EIR represents less buildout for the site than was proposed in the 2025 General Plan.

## 7. Criteria Air Pollutants and Effect

The CARB and the EPA currently focus on five "criteria pollutants" as indicators of air quality, and as such air quality studies generally focus on those five pollutants: CO, O<sub>3</sub>, NO<sub>2</sub>, SO<sub>2</sub>, and suspended particulate (i.e. PM<sub>10</sub> and PM<sub>2.5</sub>).

### a. Carbon Monoxide

CO, a colorless and odorless gas, interferes with the transfer of oxygen to the brain. It can cause dizziness and fatigue, and can impair central nervous system functions. CO is emitted almost exclusively from the incomplete combustion of fossil fuels. Automobile exhausts release approximately 70 percent of the CO in the Bay Area. A substantial amount also comes from burning wood in fireplaces and wood stoves. CO is a non-reactive air pollutant that dissipates relatively quickly, so ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. The highest CO concentrations measured in the Bay Area are typically recorded during the winter.

### b. Ozone

O<sub>3</sub>, a colorless toxic gas, is the chief component of urban smog. Short-term O<sub>3</sub> exposure can reduce lung function in children, make persons susceptible to respiratory infection, and produce symp-

toms that cause people to seek medical treatment for respiratory distress. Long-term exposure can impair lung defense mechanisms and lead to emphysema and chronic bronchitis. Sensitivity to O<sub>3</sub> varies among individuals, but about 20 percent of the population is sensitive to O<sub>3</sub>, with exercising children being particularly vulnerable. Although O<sub>3</sub> is not directly emitted, it forms in the atmosphere through a chemical reaction between reactive organic gas (ROG) and nitrogen oxides (NO<sub>x</sub>) under sunlight. ROG and NO<sub>x</sub> are primarily emitted from automobiles and industrial sources. O<sub>3</sub> is present in relatively high concentrations within the Bay Area, and the damaging effects of photochemical smog are generally related to the concentration of O<sub>3</sub>. Highest O<sub>3</sub> concentrations occur during summer and early autumn, on days with low wind speeds or stagnant air, warm temperatures, and cloudless skies.

c. Nitrogen Dioxide

NO<sub>2</sub>, a reddish-brown gas, irritates the lungs. It can cause breathing difficulties at high concentrations. Like O<sub>3</sub>, NO<sub>2</sub> is not directly emitted, but is formed through a reaction between nitric oxide (NO) and atmospheric oxygen. NO and NO<sub>2</sub> are collectively referred to as nitrogen oxides (NO<sub>x</sub>) and are major contributors to O<sub>3</sub> formation. NO<sub>2</sub> also contributes to the formation of PM<sub>10</sub> (see discussion of PM<sub>10</sub> below).

d. Sulfur Oxides

Sulfur oxides, primarily SO<sub>2</sub>, are a product of high-sulfur fuel combustion. The main sources of SO<sub>2</sub> are coal and oil used in power stations, in industries, and for domestic heating. SO<sub>2</sub> is an irritant gas that attacks the throat and lungs. It can cause acute respiratory symptoms and diminished ventilator function in children. SO<sub>2</sub> concentrations have been reduced to levels well below the State and national standards, but further reductions in emissions are needed to attain compliance with standards for PM<sub>10</sub>, of which SO<sub>2</sub> is a contributor.

e. Suspended Particulate Matter

Particulate matter pollution consists of very small liquid and solid particles suspended in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter also forms when industry and gaseous pollutant undergo chemical reactions in the atmosphere. Respirable particulate matter (PM<sub>10</sub>) and fine particulate matter (PM<sub>2.5</sub>) represent fractions of particulate matter. PM<sub>10</sub> refers to particulate matter less than 10 microns in diameter and PM<sub>2.5</sub> refers to particulate matter that is 2.5 microns or less in diameter. Major sources of PM<sub>10</sub> include motor vehicles; wood burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions. PM<sub>2.5</sub> results primarily from diesel fuel combustion (from motor vehicles, power generation, industrial facilities), residential fireplaces, and wood stoves. PM<sub>10</sub> and PM<sub>2.5</sub> pose a greater health risk than larger-size particles, because these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract increasing the number and

severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. Whereas, larger particles tend to collect in the upper portion of the respiratory system, PM<sub>2.5</sub> are so tiny that they can penetrate deeper into the lungs and damage lung tissues. Suspended particulates also damage and discolor surfaces on which they settle, as well as produce haze and reduce regional visibility.

#### **8. Toxic Air Contaminants (TACs)**

TACs are a broad class of compounds known to cause morbidity or mortality (usually because they cause cancer) and include, but are not limited to, the criteria air pollutants listed above. TACs are found in ambient air, especially in urban areas, and are caused by industry, agriculture, fuel combustion, and commercial operations (e.g. dry cleaners). TACs are typically found in low concentrations, even near their source (e.g. benzene near a freeway). Because chronic exposure can result in adverse health effects, TACs are regulated at the regional, State and federal level.

Diesel exhaust is the predominant TAC in urban air and is estimated to represent about two-thirds of the cancer risk from TACs (based on the statewide average). CARB describes diesel exhaust as a complex mixture of gases, vapors and fine particles. This complexity makes the evaluation of health effects of diesel exhaust a complex scientific issue. Some of the chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by the CARB, and are listed as carcinogens either under the State's Proposition 65 or under the federal Hazardous Air Pollutants programs. California has adopted a comprehensive diesel risk reduction program. The EPA has adopted low sulfur diesel fuel standards that reduce diesel particulate matter substantially. These came into effect in 2006.

In cooler weather, smoke from residential wood combustion can be a source of TACs. Localized high TAC concentrations can result when cold stagnant air traps smoke near the ground and, with no wind, the pollution can persist for many hours. This occurs in sheltered valleys during the winter. Wood smoke also contains a significant amount of PM<sub>10</sub> and PM<sub>2.5</sub>. Wood smoke is an irritant and is implicated in worsening asthma and other chronic lung problems.

#### **9. Bay Area Clean Air Plans**

The BAAQMD, the Metropolitan Transportation Commission (MTC), and the Association of Bay Area Governments (ABAG) prepared the Bay Area 2001 Ozone Attainment Plan. This plan is a proposed revision to the Bay Area's part of the State Implementation Plan, or SIP to achieve the NAAQS for the 1-hour ozone standard. The plan was prepared in response to U.S. EPA's partial approval and partial disapproval of the Bay Area's 1999 Ozone Attainment Plan. Although U.S. EPA revoked the 1-hour NAAQS, commitments made in that plan along with emissions budgets remain valid until the region develops an attainment demonstration/maintenance plan for the 8-hour NAAQS for ozone. The U.S. EPA has already determined that the region met the 1997 8-

hour ozone standard. However, the region would not be required to submit a maintenance plan and demonstration of attainment with a request for redesignation to U.S. EPA prior to be formally redesignated. BAAQMD will likely not act on this submittal since the EPA recently adopted a more stringent standard. The U.S. EPA will be making new attainment designations based on this new standard in about three years and then revoking the older standard..

A Carbon Monoxide Maintenance Plan was approved in 1998 by EPA, which demonstrated how the NAAQS for CO standard will continue to be maintained. CO levels have remained well below the NAAQS throughout the Bay Area.

In 1991, the BAAQMD, MTC and ABAG prepared the Bay Area 1991 Clean Air Plan or CAP. This air quality plan addresses the California Clean Air Act. Updates are developed approximately every three years. The plans were meant to demonstrate progress toward meeting the more stringent 1-hour ozone CAAQS. The latest update to the plan, which was adopted in January 2006, is called the *Bay Area 2005 Ozone Strategy*. This plan includes a comprehensive strategy to reduce emissions from stationary, area, and mobile sources. The plan objective is to indicate how the region would make progress toward attaining the stricter state air quality standards, as mandated by the California Clean Air Act. The plan is designed to achieve a region-wide reduction of ozone precursor pollutants through the expeditious implementation of all feasible measures. The plan proposes expanded implementation of transportation control measures (TCMs) and programs such as Spare the Air. Spare the Air is a public outreach program designed to educate the public about air pollution in the Bay Area and promote individual behavior changes that improve air quality. Some of these measures or programs rely on local governments for implementation. An update to the plan is currently being developed and should be available in 2009.

There is no formal clean air plan addressing PM<sub>10</sub> or PM<sub>2.5</sub>. The clean air planning efforts for ozone will also reduce PM<sub>10</sub> and PM<sub>2.5</sub>, since a substantial amount of this air pollutant comes from combustion emissions such as vehicle exhaust. In addition, BAAQMD adopts and enforces rules to reduce particulate matter emissions and develops public outreach programs to educate the public to reduce PM<sub>10</sub> and PM<sub>2.5</sub> emissions (e.g. Winter Spare the Air Program). SB 656 required further action by CARB and air districts to reduce public exposure to PM<sub>10</sub> and PM<sub>2.5</sub>. Efforts identified by BAAQMD in response to SB656 are primarily targeting reductions in wood smoke emissions and adoption of new rules to further reduce NO<sub>x</sub> and particulate matter from internal combustion engines and reduce particulate matter from commercial charbroiling activities. BAAQMD recently adopted a rule addressing residential wood burning. The rule restricts operation of any indoor or outdoor fireplace, fire pit, wood or pellet stove, masonry heater or fireplace insert on specific days during the winter when air quality conditions are forecasted to exceed the NAAQS for PM<sub>2.5</sub>. The rule also limits excess visible emissions from wood burning devices and require clean burning technology for wood burning devices sold (or resold) or installed in the Bay Area. Controls on ozone

precursor emissions that include NO<sub>x</sub> and ROG would reduce particulate matter concentrations in winter. NO<sub>x</sub> emissions contribute to ammonium nitrate formation that resides in the atmosphere as particulate matter. The Bay Area experiences the highest PM<sub>10</sub> and PM<sub>2.5</sub> in winter when wood smoke and ammonium nitrate contributions to particulate matter are highest.

A key element in air quality planning is to make reasonably accurate projections of future human activities that are related to air pollutant emissions. Most important is vehicle activity. The BAAQMD uses population projections made by the ABAG and vehicle use trends made by the MTC to formulate future air pollutant emission inventories. The basis for these projections comes from cities and counties. In order to provide the best plan to reduce air pollution in the Bay Area, accurate projections from local governments are necessary. When General Plans are not consistent with these projections, they cumulatively reduce the effectiveness of air quality planning in the region.

## *B. Existing Conditions*

### **1. Climate and Topography**

The climate in the project area is mainly characterized by warm dry summers with abundant sunshine and cool moist winters with variable cloudiness. The proximity of the Pacific Ocean and San Francisco Bay has a moderating influence on the climate. The major large-scale weather feature controlling the area's climate is a large high-pressure system located in the eastern Pacific Ocean, known as the Pacific High. The strength and position of the Pacific High varies seasonally. It is strongest and located off the west coast of the United States during summer. Large-scale atmospheric subsidence associated with the Pacific High, produces an elevated temperature inversion along the West Coast. The base of this inversion is usually located from 1,000 to 3,000 feet above mean sea level, depending on the warmth of the air column, intensity of subsidence and the prevailing weather condition. Vertical mixing is often limited to the base of the inversion, trapping air pollutants in the lower atmosphere. Marine air trapped below the base of the inversion is often condensed into fog or stratus clouds by the cool Pacific Ocean. This condition is typical of the warmer months of the year from roughly May through October. Stratus clouds usually form offshore and move into the Petaluma Valley during the evening hours when onshore winds are strongest and solar heating begins to wane. A moderate to strong sea breeze is common in the valley most afternoons from spring through early fall. As the land warms the following morning when onshore winds are weakest, the clouds often dissipate, except along the immediate coast. The stratus then redevelops and moves inland late in the day. Otherwise, clear skies and dry conditions prevail during summer.

As winter approaches, the Pacific High becomes weaker and shifts south, allowing both low and high pressure systems associated with the polar jet stream to affect the region. Low pressure systems are usually accompanied by frontal systems that produce periods of cloudiness, strong shifting winds, and precipitation. The number of days with precipitation can vary greatly from year to year, resulting in a wide range of annual precipitation totals. Annual precipitation is about 25 inches, with most of that falling in November through March. High pressure systems are also common in winter and can produce cool stagnant conditions. Radiation fog and haze are common during extended winter periods where high pressure systems influence the weather.

The project site lies in the Petaluma Valley, which is located in the southern portion of Sonoma County, north of San Francisco Bay. This valley is bordered by relatively low mountains to the west and Sonoma Mountain to the east. The valley allows cool marine air to flow into the Bay Area from the northwest. The valley along with the area of low hills to the west is also known as the Petaluma Gap. During the day, especially during summer afternoons, the prevailing wind flows from the northwest through the gap. During the evening, especially in winter, a reverse of this flow often occurs when the wind is from the southeast.

Wind speeds in the region are generally moderate. Data from a BAAQMD meteorological station at the Petaluma Airport (operated from 1993 to 1997) indicate the average wind speed is about 7 miles per hour. Winds are from a northwesterly direction about 65 percent of the time and southeasterly winds occurred about 15 percent of the time. The strongest winds are from the southeast and are associated with winter storm systems. Strong northwest winds occur during the spring. Average maximum summer temperatures are around 80°F with minimum temperatures in the 50's. Average maximum winter temperatures are in the high 50's to low 60's, while the minimum temperatures are in the 30's with frost common on clear nights.

## **2. Air Pollution Potential**

The clear skies with relatively warm conditions that are typical of summer days combine with localized air pollutant emissions to elevate O<sub>3</sub> levels. Air quality standards for O<sub>3</sub> traditionally are not exceeded around Petaluma. However, emissions from the area can lead to exceedances of the O<sub>3</sub> CAAQS in the northern part of Sonoma County and in other parts of the Bay Area when relatively stagnant conditions occur for periods of several days during the warmer months of the year. Weak wind flow patterns combined with strong inversions substantially reduce normal atmospheric mixing. Key components of ground-level O<sub>3</sub> formation in urban are sunlight and heat; therefore, significant O<sub>3</sub> formation only occurs during the months from late spring through early fall. Air pollution potential in the project area is not as high as other parts of the Bay Area because winds generally do not transport enough of the precursor pollutants into the area (highest concentrations occur at monitoring stations in the eastern and southern portions of the Bay Area that are

usually downwind of the major urban areas). The afternoon sea breeze, which begins early in Petaluma, usually disperses O<sub>3</sub> and the associated precursor pollutants.

The Petaluma Valley has a high occurrence of strong surface-based inversions during the late fall and early winter. Light winds that are common in winter combine with the strong surface-based inversions caused by cold air trapped near the surface, to trap pollutants such as particulates (e.g. wood smoke) and CO. This can lead to localized high concentrations of these pollutants.

### 3. Air Monitoring Data

The BAAQMD monitors air quality conditions at over 30 locations throughout the Bay Area. The Santa Rosa Monitoring Station is closest to Petaluma. The gaseous pollutants (i.e. O<sub>3</sub>, CO and NO<sub>2</sub>) are monitored continuously while particulate matter (i.e. PM<sub>10</sub> and PM<sub>2.5</sub>) are sampled for 24 hours every sixth day. A summary of the data recorded is shown in Table 4.3-3 for the period 2003 through 2007.

Table 4.3-4 shows the number of days per year that air pollutant levels exceeded national or State standards in Santa Rosa and the entire Bay Area monitoring network. There was one exceedance of the CAAQS standard for O<sub>3</sub> (1- or 8-hour concentrations) recorded at this station in 2003. Measured concentrations of CO and NO<sub>2</sub> did not exceed the NAAQS or CAAQS. Measured concentrations of PM<sub>10</sub> also exceeded the State standards during the five-year period. The State standard for PM<sub>10</sub> was exceeded on zero to two sampling days annually during the period. There was one exceedance of the NAAQS for PM<sub>2.5</sub> in 2006.

Data from all stations throughout the Bay Area indicate that the NAAQS for O<sub>3</sub> concentrations was exceeded 1 to 12 days annually. The more stringent State O<sub>3</sub>- 1-hour standard was exceeded on 4 to 19 days annually and the new 8-hour standard was exceeded 9 to 22 days annually. The State PM<sub>10</sub> standard was exceeded on 4 to 15 sampling days annually. The new PM<sub>2.5</sub> national standard was exceeded on 10 to 14 days annually. PM<sub>10</sub> and PM<sub>2.5</sub> are sampled every sixth day at Santa Rosa and most Bay Area monitoring stations.

### 4. Attainment Status

Areas that do not violate ambient air quality standards are considered to have attained the standard. Violations of ambient air quality standards are based on air pollutant monitoring data and are judged for each air pollutant. The Bay Area as a whole does not meet State or federal ambient air quality standards for ground level O<sub>3</sub> and State standards for particulate matter (both PM<sub>10</sub> and PM<sub>2.5</sub>). Recently (December 2008) EPA designated the entire Bay Area as nonattainment for the 24-hour PM<sub>2.5</sub> NAAQS. Violations of the NAAQS at the Vallejo and San Jose stations prompted this action. The final EPA order formally designating the Bay Area as nonattainment with the federal PM<sub>2.5</sub> standard becomes effective in April 2009. The Bay Area will then have until April 2012

CITY OF PETALUMA  
 EAST WASHINGTON PLACE EIR  
 AIR QUALITY

TABLE 4.3-3 HIGHEST MEASURED AIR POLLUTANT CONCENTRATIONS

Pollutant	Average Time	Measured Air Pollutant Levels				
		2003	2004	2005	2006	2007
<b>Santa Rosa</b>						
O <sub>3</sub>	1-Hour	0.10 ppm	0.08 ppm	0.072 ppm	0.077 ppm	0.079 ppm
	8-Hour	0.08 ppm	0.06 ppm	0.051 ppm	0.058 ppm	0.059 ppm
CO	8-Hour	1.8 ppm	1.6 ppm	2.0 ppm	1.7 ppm	1.7 ppm
NO <sub>2</sub>	1-Hour	0.06 ppm	0.05 ppm	0.05 ppm	0.04 ppm	0.05 ppm
	Annual	0.012 ppm	0.011 ppm	0.011 ppm	0.011 ppm	0.011 ppm
Fine Particulate Matter (PM <sub>2.5</sub> )	24-Hour	39 µg/m <sup>3</sup>	27 µg/m <sup>3</sup>	34 µg/m <sup>3</sup>	59 µg/m <sup>3</sup>	32 µg/m <sup>3</sup>
	Annual	9 µg/m <sup>3</sup>	8 µg/m <sup>3</sup>	8 µg/m <sup>3</sup>	9 µg/m <sup>3</sup>	8 µg/m <sup>3</sup>
Respirable Particulate Matter (PM <sub>10</sub> )	24-Hour	36 µg/m <sup>3</sup>	48 µg/m <sup>3</sup>	39 µg/m <sup>3</sup>	90 µg/m <sup>3</sup>	37 µg/m <sup>3</sup>
	Annual	17 µg/m <sup>3</sup>	18 µg/m <sup>3</sup>	16 µg/m <sup>3</sup>	19 µg/m <sup>3</sup>	17 µg/m <sup>3</sup>
<b>Bay Area (Basin Summary)</b>						
O <sub>3</sub>	1-Hour	0.13 ppm	0.11 ppm	0.113 ppm	0.127 ppm	0.120 ppm
	8-Hour	0.10 ppm	0.08 ppm	0.090 ppm	0.105 ppm	0.091 ppm
CO	8-Hour	4.0 ppm	3.4 ppm	3.1 ppm	2.9 ppm	2.7 ppm
NO <sub>2</sub>	1-Hour	0.09 ppm	0.07 ppm	0.07 ppm	0.11 ppm	0.07 ppm
	Annual	0.021 ppm	0.019 ppm	0.019 ppm	0.018 ppm	0.017 ppm
Fine Particulate Matter (PM <sub>2.5</sub> )	1-Hour	56 ug/m <sup>3</sup>	74 ug/m <sup>3</sup>	55 ug/m <sup>3</sup>	75 ug/m <sup>3</sup>	58 ug/m <sup>3</sup>
	Annual	11.7 ug/m <sup>3</sup>	11.6 ug/m <sup>3</sup>	12 ug/m <sup>3</sup>	11 ug/m <sup>3</sup>	11 ug/m <sup>3</sup>
Respirable Particulate Matter (PM <sub>10</sub> )	24-Hour	60 µg/m <sup>3</sup>	65 µg/m <sup>3</sup>	81 µg/m <sup>3</sup>	90 µg/m <sup>3</sup>	75 µg/m <sup>3</sup>
	Annual	25 ug/m <sup>3</sup>	26 ug/m <sup>3</sup>	21 ug/m <sup>3</sup>	23 ug/m <sup>3</sup>	22 ug/m <sup>3</sup>

Notes: ppm = parts per million

Values reported in *bold/italic* exceed a CAAQS or NAAQS.

NA = data not available.

\* Partial data set for some pollutants.

Source: Bay Area Air Quality Management District 2001-2007.

TABLE 4.3-4 SUMMARY OF MEASURED AIR QUALITY EXCEEDANCES

Pollutant	Standard	Monitoring Station	Days Exceeding Standard				
			2003	2004	2005	2006	2007
O <sub>3</sub>	NAAQS 1-hr	Santa Rosa	0	0	--	--	--
		Bay Area	1	0	--	--	--
	NAAQS 8-hr	Santa Rosa	0	0	0	0	0
		Bay Area	7	0	1	12	1
	CAAQS 1-hr	Santa Rosa	1	0	0	0	0
		Bay Area	19	7	9	18	4
CAAQS 8-hr	Santa Rosa	--	--	0	0	0	
	Bay Area	--	--	9	22	9	
PM <sub>10</sub>	NAAQS 24-hr	Santa Rosa	0	0	0	0	0
		Bay Area	0	0	0	0	0
	CAAQS 24-hr	Santa Rosa	0	1	0	2	0
		Bay Area	6	7	6	15	4
PM <sub>2.5</sub>	NAAQS 24-hr	Santa Rosa	--	--	0	1	0
		Bay Area	0	1	0	10	14
All Other (CO, NO <sub>2</sub> , Lead, SO <sub>2</sub> )	All Other	Santa Rosa	0	0	0	0	0
		Bay Area	0	0	0	0	0

Source: Bay Area Air Quality Management District 2001-2007.

to develop a plan for meeting the standard and will have until April 2014 to achieve compliance with the standard.

Under the Federal CAA, the U.S. EPA has classified the region as marginally nonattainment for the 1997 8-hour ozone standard. U.S. EPA required the region to attain the standard by 2007. The U.S. EPA determined that the Bay Area has met this standard, but a formal redesignation request and maintenance plan would have to be submitted before formal redesignation could be made. In May 2008, U.S. EPA lowered the 8-hour ozone standard from 0.08 to 0.075 ppm. Final designations based upon the new 0.075 ppm standard will be made by March 2010. The Bay Area has met the CO standards for over a decade and is classified attainment maintenance by the U.S. EPA. The U.S. EPA grades the region unclassified for all other air pollutants, which include PM<sub>10</sub> and PM<sub>2.5</sub>. Recent PM<sub>2.5</sub> monitoring data for the region suggest that the new national PM<sub>2.5</sub> standards for 24-hour exposures are exceeded. U.S. EPA is expected to make rulings on area attainment designations by December 2009, based on a recent three-year set of monitoring data.

At the State level, the region is considered *serious non-attainment* for ground level O<sub>3</sub> and *non-attainment* for PM<sub>10</sub> and PM<sub>2.5</sub>. As noted earlier, California ambient air quality standards are more stringent than the national ambient air quality standards. The region is required to adopt plans on

a triennial basis that show progress towards meeting the State O<sub>3</sub> standard. The area is considered attainment or unclassified for all other pollutants.

## 5. Odors

While offensive odors rarely cause any physical harm, they can be unpleasant, leading to considerable distress among the public and often generating citizen complaints to local governments and the BAAQMD. The occurrence and severity of odor problems depends on numerous factors, including the nature, frequency and intensity of the source, wind speed and direction, and the sensitivity of the receptor(s).

## 6. Sensitive Receptors

Some groups of people are more affected by air pollution than others. CARB has identified the following groups who are most likely to be affected by air pollution: children under 14, adults over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, elementary schools, school playing fields and parks.

### C. Greenhouse Gases

Gases that trap heat in the atmosphere, or greenhouse gases (GHGs), regulate the earth's temperature. This is known as the Greenhouse Effect, which is responsible for maintaining a habitable climate. GHGs are emitted by natural processes and human activities. Emissions from human activities, including motor vehicle use, electricity production, industry, and agriculture, are elevating the concentration of GHGs in the atmosphere, and have led to a trend of unnatural warming of the earth's natural climate, known as global warming or climate change.

An expanding body of scientific research supports the theory that global warming is currently affecting changes in weather patterns, average sea level, ocean acidification, chemical reaction rates and precipitation rates, and that it will increasingly do so in the future. The climate and several naturally-occurring resources within California could be adversely affected by the global warming trend. Increased precipitation and sea level rise could increase coastal flooding, saltwater intrusion (a particular concern in the low-lying Sacramento-San Joaquin Delta, where potable water delivery pumps could be threatened), and degradation of wetlands. Mass migration and/or loss of plant and animal species could also occur. Potential effects of global climate change that could adversely affect human health include, but are not necessarily limited to, more extreme heat waves and heat-related stress; an increase in climate-sensitive diseases; more frequent and intense natural disasters, such as flooding, hurricanes and drought; and increased levels of air pollution.

Prominent GHGs that contribute to global warming include the following gases, in addition to ozone and water vapor.

- ◆ Carbon dioxide and nitrous oxide, byproducts of fossil fuel combustion.
- ◆ Nitrous oxide, associated with agricultural operations such as crop fertilization.
- ◆ Methane, commonly created by off-gassing from agricultural practices (e.g. keeping livestock) and landfill operation.
- ◆ Chlorofluorocarbons, widely used in the past as refrigerants, propellants and cleaning solvents, but their production has been stopped by international treaty.
- ◆ Hydrofluorocarbons, now used as a substitute for chlorofluorocarbons in refrigeration and cooling.
- ◆ Perfluorocarbons and sulfur hexafluoride emissions, commonly created by industries such as aluminum production and semi-conductor manufacturing.

### 1. Greenhouse Gas Emissions

It is estimated that the United States contributes up to 35 percent of the world's CO<sub>2</sub> equivalent emissions. California is the second largest emitter of GHGs in the country and the fifteenth largest in the world. California GHG emissions or CO<sub>2</sub> equivalent emissions was estimated at 484 million metric tons of equivalent CO<sub>2</sub> emissions (MMTCO<sub>2</sub>e) in 2004, which is about 7 percent of the emissions from the entire United States (CARB 2007). While California is the second largest emitter of GHGs, behind Texas, it has the lowest per capita rate of GHG emissions in the country. Transportation is the largest source of GHG emissions in California, contributing about 38 percent of the emissions. Electricity generation is second at over 23 percent. Industrial activities account for about 20 percent of the State's emissions. Under a "business as usual" scenario, GHG emissions are estimated to increase to approximately 600 MMTCO<sub>2</sub>e by 2020. CARB staff has estimated the 1990 statewide emissions level to be 427 MMTCO<sub>2</sub>e. Therefore, in order to meet the AB 32 requirement discussed in section A.3, to reduce GHG emissions to the 1990 levels by 2020, the State will need to reduce its 2020 "business as usual" emission levels by almost 30 percent.

### 2. City of Petaluma

The City has implemented, or is in the process of implementing, many programs to reduce the municipal operations emissions. Major components of this program include lighting retrofits that reduce energy demand and replacement of fleet vehicles with more efficient, low emissions model. The City formed a Green Team, consisting of City staff members and citizens.<sup>2</sup>

---

<sup>2</sup> City of Petaluma, "Green Team", <http://cityofpetaluma.net/cdd/big/index.html>, accessed on December 9, 2008, Leslie Wilson, DC&E.

As part of the General Plan, the City prepared an emissions inventory, identifying 1990 and 2005 emissions and forecasting emissions for 2025 with buildout of the General Plan. GHG emissions for the city were estimated to have increased by 10.1 tons per person to 10.7 tons from 1990 to 2005, or from 434,900 to 610,400 tons.<sup>3</sup> Under a business as usual scenario, emissions are forecasted to increase to 721,600 tons by 2025 with full buildout of the General Plan. However, these emissions do not account for reductions based on implementation of the new General Plan policies and State AB 32 measures.

The City developed over 10 specific policies as part of its General Plan update that specifically address GHG emissions (Policies 4-P-18 through 4-P-28). However, additional policies that would reduce GHG emissions from future development in Petaluma are found in different elements of the General Plan. In total, there are about 90 General Plan policies that would help reduce GHG emissions.

In November 2007, the City released a revision to the General Plan 2025 EIR, which analyzed potential GHG emissions resulting from buildout of the 2025 General Plan. The report contained one significant and unavoidable impact. Impact 3.10-6 read:

*“It cannot be determined to a reasonable degree of certainty that buildout under the General Plan will not result in a cumulatively considerable incremental contribution to the significant cumulative impact of global climate change. Therefore, cumulative global climate change impacts could remain significant and unavoidable.”<sup>4</sup>*

#### ***D. Standards of Significance***

The project would have a significant effect on the environment with respect to air quality if it would:

1. Conflict with or obstruct implementation of the applicable air quality plan.
2. Violate any air quality standard or contribute substantially to an existing or projected air quality violation.
3. Result in a cumulatively considerable net increase of any nonattainment pollutant.
4. Expose sensitive receptors to substantial pollutant concentrations.
5. Create objectionable odors affecting a substantial number of people.

---

<sup>3</sup> City of Petaluma General Plan 2025.

<sup>4</sup> City of Petaluma, *Petaluma General Plan 2005, Air Quality – Greenhouse Gas Emissions Section Revised draft Environmental Impact Report*, November 2007, p. 3.10-35.

6. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.
7. Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?

To further clarify how the above thresholds are assessed, the significance criteria established by the applicable air quality management district or air pollution control district is relied upon. The following are the significance criteria that the BAAQMD has established to determine project impacts and which are used in this EIR:

- ◆ A substantial net increase of any criteria pollutant caused by the project, which is defined by BAAQMD as direct or indirect emissions of greater than 80 pounds per day for ROG, NO<sub>x</sub>, or PM<sub>10</sub>. These emissions are based on average daily emissions caused by a project<sup>5</sup>;
- ◆ A substantial contribution to an existing or projected violation of an ambient air quality standard would result if the project would cause an exceedance of the California Ambient Air Quality Standard for carbon monoxide of 9.0 parts per million over an 8-hour averaging period;
- ◆ Expose sensitive receptors or the general public to substantial pollutant concentrations. (This is evaluated by assessing the health risk in terms of cancer risk or hazards posed by the placement of new sources of air pollutant emissions near existing sensitive receptors or placement of new sensitive receptors near existing sources.) A significant impact would occur if the project results in probability of greater than one in 10 million that the Maximally Exposed Individual (MEI) will contract cancer;
- ◆ Create or expose a substantial number of people to objectionable odors.

The BAAQMD Guidelines recommend that cumulative impacts be evaluated based on the significance of operational air quality impacts and evaluation of the consistency of the project with the General Plan and of the General Plan with the Clean Air Plan.

#### *E. Analysis Assumptions*

The following methodology was used to assess project air quality impacts. A detailed study of Air Quality existing conditions is presented in Appendix B.

---

<sup>5</sup> Email from Greg Tholen (Senior Planner with BAAQMD) to James Reyff (Illingworth & Rodkin, Inc.), dated October 30, 2008.

### 1. Consistency with Clean Air Planning Efforts

The BAAQMD CEQA Guidelines: *Assessing the Air Quality Impacts of Projects and Plans (1999)* recommends using an analysis that determines the consistency between the plan's projected population growth and vehicle miles traveled (VMT) to the projections in the latest Clean Air Plan (CAP). Consistency is also demonstrated by assessing whether the plan implements all of the applicable CAP transportation control measures, and whether the plan provides buffer zones around potential sources of odors, toxics and accidental releases.

A key element in air quality planning is to make reasonably accurate projections of future human activities, particularly vehicle activities that are related to air pollutant emissions. The BAAQMD uses population projections made by ABAG and vehicle use trends made by MTC to formulate future air pollutant emission inventories. These projections are based on land uses information provided by cities and counties. In order to provide the best plan to reduce air pollution in the Bay Area, accurate projections from local governments are necessary. When projects and General Plans are not consistent with these projections, they cumulatively reduce the effectiveness of air quality planning in the region. The *Bay Area 2005 Ozone Strategy*, which addresses the more stringent State ozone standards, was adopted on January 4, 2006 by the BAAQMD. The plan is based on projections as of 2003.

### 2. Construction

The BAAQMD's approach to the CEQA analysis of construction impacts is to emphasize the implementation of effective and comprehensive control measures rather than detailed quantification of emissions. PM<sub>10</sub> is the pollutant of greatest concern from construction activities. The BAAQMD CEQA Guidelines provide feasible control measures for construction emissions of PM<sub>10</sub>. If the appropriate construction controls are implemented, air pollutant emissions for construction activities would be considered *less than significant*.

### 3. Operations – Regional Air Quality

Project buildout would cause a significant air quality impact if it were to result in Ozone precursor emissions (ROG and NO<sub>x</sub>) and PM<sub>10</sub> emissions from direct and indirect sources (non-typical construction) that exceed the thresholds recommended by the BAAQMD. The BAAQMD recommends a threshold of 80 pounds per day or 15 tons per year for average direct and indirect sources of ROG, NO<sub>x</sub> and PM<sub>10</sub>. These emissions are based on average daily emissions caused by a project.<sup>6</sup> The BAAQMD does not have thresholds that directly address PM<sub>2.5</sub>. The PM<sub>10</sub> threshold was developed to address the State 24-hour PM<sub>10</sub> standard. However, since PM<sub>10</sub> particulates in-

---

<sup>6</sup> Email from Greg Tholen (Senior Planner with BAAQMD) to James Reyff (Illingworth & Rodkin, Inc.), dated October 30, 2008.

cludes PM<sub>2.5</sub>, the PM<sub>10</sub> threshold in this evaluation is considered to address PM<sub>2.5</sub>. Meeting the State 24-hour PM<sub>10</sub> standards is more of a challenge than the State or federal standards for PM<sub>2.5</sub>.

To evaluate the project effects on regional air quality, emissions of ozone precursor pollutants and PM<sub>10</sub> were predicted. The URBEMIS2007 Model Version 9.2.4 was used to predict air pollutant emissions associated with project-related automobile use. This model combines assumptions for automobile activity (e.g. number of trips, vehicle mix, vehicle miles traveled) with vehicle emission factors. The model was set up to use default inputs for the San Francisco Bay Area along with project type and size, specific trip generation data, and buildout year.

#### **4. Operations – Local Air Quality**

Emissions of CO from traffic that cause a projected exceedance of the ambient CO State standard of 9.0 ppm for 8-hour averaging period.

#### **5. Exposure of New Residences to Toxic Air Contaminants**

CARB has identified diesel particulate matter (DPM) as a TAC. Under the BAAQMD CEQA Guidelines, an incremental risk of greater than ten cases per million at the Maximally Exposed Individual (MEI) (in the case of the project being proposed residences near Highway 101) would result in a significant impact. The project does not propose sensitive land uses such as residences; therefore, there would be no impact.

#### **6. Greenhouse Gas Modeling**

Greenhouse gas emissions were computed for future operation of the project based on guidance provided by the California Air Pollution Officers Association (CAPCOA) CO<sub>2</sub> emissions were estimated using the URBEMIS2007 Model, which is based on projected new vehicle trips and area sources, was used to estimate operational emissions from area sources and traffic. Indirect source emissions from electricity usage were based on rates recommended by the California Climate Action Registry General Reporting Protocol (CCAR) and electricity emission rates recommended by the US EPA.

#### **7. Greenhouse Gas Reduction Efforts**

Please refer to Sections A.3 and C for a discussion of relevant State and City Greenhouse Gas reduction efforts.

## F. Impact Discussion

### 1. Project Impacts

The following provides a discussion of the project-related impacts that could occur as a result of the proposed project.

#### 1. Conflict with or obstruct implementation of the applicable air quality plan.

The project would include development of a mixture of retail and office uses on land that is designated by the current General Plan as “Mixed Use.” This development would generally constitute infill development, as the project site is in an existing urbanized area and is surrounded by existing development and infrastructure (e.g. East Washington Street).

The economic analysis for this project (contained in Appendix D) indicates that the retail portion of the project would capture nearby customers that would otherwise travel outside of Petaluma for their shopping). Therefore, the project may reduce travel to large retail areas outside of the City. However, the development and growth assumptions for Petaluma, including the Project site, that were assumed in the regional clean air plan (*2005 Ozone Strategy*) were based on the City’s previous General Plan, which included different land use and zoning designations for the Project site, did not permit the intensity of development that is currently under the “Mixed Use” land use designation. As a result, the employee and retail patron population that would be generated by the project, as well as the associated vehicle trips, was not accounted for in the *2005 Ozone Strategy*. Therefore, while the project is consistent with the new General Plan, it is inconsistent with the Clean Air Plan that was approved prior to adoption of the General Plan 2025. Furthermore, the General Plan EIR found that the General Plan was inconsistent with the Clean Air Plan because of the difference in population and vehicle miles traveled projections. It should be noted that BAAQMD is in the process of writing the 2009 Clean Air Plan<sup>7</sup>. This would nullify the significance of the impact through the inclusion of the latest planning assumptions. However, the project would be considered to have a *significant* impact until such a time as the updated plan is adopted.

The policies of the Petaluma General Plan partially or entirely implement TCMs contained in the *2005 Bay Area Ozone Strategy*. The General Plan EIR found the city policies to be consistent with the 2005 Bay Area Ozone Attainment Strategy with respect to implementation of TCMs.

#### 2. Violate any air quality standard or contribute substantially to an existing or projected air quality violation.

---

<sup>7</sup> Bay Area Air Quality Management District, accessed online, [http://www.baaqmd.gov/pln/plans/ozone/2009\\_strategy/index.htm](http://www.baaqmd.gov/pln/plans/ozone/2009_strategy/index.htm) December 10, 2008 by Leslie Wilson, DC&E.

a. Vehicle Traffic

The project is anticipated to generate new automobile trips during weekday PM peak-hour periods. CO emissions from traffic generated by the project would be the pollutant of greatest concern at the local level. The intersections of North McDowell\East Washington, Ellis Street\East Washington, and Payran\E. Washington would be the most affected by the project and experience the combination of highest traffic volumes and worst congestion. Congested intersections with a large volume of traffic have the greatest potential to cause high-localized concentrations of CO. CO concentrations were predicted for these intersections. There are 1- and 8-hour CO concentrations were modeled using methods recommended by the BAAQMD that are based on the Caline4 Line-Source dispersion model. This method uses total traffic volumes, emissions, meteorology, and the roadway/receptor geometry. For this assessment, meteorological conditions most conducive for high CO concentrations in the Bay Area, peak-hour traffic conditions (i.e. evening period), and emission factors representing slow traffic speeds generated by the CARB emission factor model (i.e. EMFAC2007) were used as input to the model. Modeled concentrations were added to background CO levels to predict total CO concentrations. The background 8-hour CO level is estimated to be 2.0 ppm, based on recent Santa Rosa monitoring data standards for CO. The 8-hour standard is the most stringent and is always exceeded if the 1-hour standard is exceeded. Therefore, this analysis evaluated impacts against the 8-hour standard.

CO concentrations were predicted for existing conditions (2008), project conditions in the short-term (2010) and cumulative buildout with the project that would occur around 2025. The screening method is designed to be a conservative method of determining whether or not a project may cause exceedances of the CO air quality standard. If the screening method predicts significant levels, than a more-refined analysis would be used that would more accurately predict CO levels. That type of analysis would likely result in prediction of lower levels. Results of this assessment are shown in Table 4.3-5.

As shown in Table 4.3-5, the screening analysis indicates that modeled existing 8-hour CO concentrations are currently below CAAQS. Predicted 8-hour CO concentrations with the project are predicted to remain below CAAQS. Although traffic would increase under cumulative conditions, CO concentrations are anticipated to decrease in the future because of cleaner less-polluting vehicles using the roadways. The analysis predicted CO levels that are at the edge of the major roadways (e.g., East Washington). Concentrations at receptors further from the roadway, such as the swim center or skate board park, would be lower. This impact on local air quality resulting from the project is considered to be *less-than-significant*.

b. Stationary Sources

The exact nature of possible on-site stationary sources cannot be determined at this time as the retail spaces have not been leased; thus specific air emissions from future occupants of project

TABLE 4.3-5 **PREDICTED 8-HOUR WORST CASE CARBON MONOXIDE LEVELS (IN PPM)**

Description	2005 Existing	Project Conditions ~ 2008	2010 Base with Project	2025 Base with Project
East Washington and North McDowell	6.4 ppm	6.1 ppm	5.5 ppm	3.1 ppm
East Washington and Ellis\ Kenilworth	4.9 ppm	5.2 ppm	4.6 ppm	2.8 ppm
Significance Thresholds (CAAQS)	9.0 ppm for 8-hour exposure			

Note: Includes background concentration of 2.0 ppm..

structures cannot be accurately estimated. However, typical sources such as backup emergency power generators would require construction and operational permits from the BAAQMD, which would include new source review and possible application of Best Available Control Technology (BACT) emission control measures. Since new source generators would need to comply with all applicable BAAQMD regulations, regulated stationary on-site sources are generally not considered to produce significant air quality impacts. Stationary sources that are exempt from BAAQMD permit requirements because they fall below emission thresholds for permitting would not be considered to generate significant air quality impacts. For this reason, this impact is considered *less-than-significant*.

3. Result in a cumulatively considerable net increase of any nonattainment pollutant.

Emissions of ozone precursor pollutants (i.e. reactive organic gases [ROG] and nitrogen oxides [NO<sub>x</sub>]) and small particulate matter (i.e. PM<sub>10</sub>) can affect air quality throughout the Bay Area. The significance of project air pollutant emissions is evaluated against emission significance thresholds established by the BAAQMD.

The URBEMIS2007 Model described in the methodology discussion was used to quantify project emission estimate. Default parameters are used in the model such as the temperature, trip types and lengths and vehicle mix. Project trip generation data were obtained from Crane Transportation Group in the form of weekday and Saturday traffic generation. Since the BAAQMD thresholds are based on average daily emissions, an average daily emission rate was developed. The URBE-MIS2007 model was used to predict emissions during a weekday and Saturday condition. Weekday emissions were assumed to occur 5 days per week while Sunday emissions were assumed to be equivalent to Saturday emissions.

Features included in the project plans and accounted for in the URBEMIS2007 modeling that would reduce emissions related to the project include the following:

- ◆ Mixture of uses (e.g. retail and commercial)
- ◆ Proximity to local and regional transit (i.e. Sonoma Transit and Golden Gate Transit)
- ◆ Pedestrian linkages (including attractive sidewalks) throughout the site and to adjacent areas
- ◆ Bicycle linkages throughout the site (including bike lanes on adjacent roadways)
- ◆ Traffic calming features, such as slow posted speeds, speed bumps, and pedestrian crossings).

It should be noted that the effect of pass-by and diverted trips were taken into account in the emissions modeling. Pass-by trips include those trips that would already be on the roadway network and passing by the site, so they are really not new trips. Diverted trips are those that would already be on the roadway network near the project site. The URBEMIS2007 model computes the effect of pass-by and diverted link trips when the option is selected. There are no settings for this selection. According to the project Traffic Engineer, Crane Transportation Group staff, the project location, adjacent to a major city arterial and a freeway, would include pass-by and diverted trips consistent with URBEMIS2007 default values.

Vehicle emission rates for ROG and NO<sub>x</sub> are currently decreasing with each year and are predicted to decrease substantially between 2010 and 2020. For instance, NO<sub>x</sub> emission rates are predicted to decline by 56 percent during that period, due to improvements in vehicle emissions and retirement of older, more polluting, vehicles from the roadways.

PM<sub>10</sub> emissions are comprised of vehicle exhaust, tire and brake wear, and the entrainment of dust into the atmosphere from vehicles traveling on paved roadways. The contribution of tire and brake wear is small compared to the other PM emission processes. Gasoline powered engines have small rates of particulate matter emissions compared with diesel-powered vehicles. Since much of the project traffic fleet would be made up of light-duty gasoline-powered vehicles, a large portion of the PM<sub>10</sub> emissions would be from entrainment of roadway dust from vehicle travel. The URBEMIS2007 default silt loading values were changed to reflect values that CARB uses for calculating paved roadway dust emissions for the average vehicle traveling on arterial and collector roadways.

The URBEMIS2007 modeling also was used to account for area sources such as emissions from natural gas usage, landscape equipment, and consumer products.

As a worst-case assumption, the project was assumed to be fully constructed and operational in 2010. Daily emissions of regional air pollutants from build-out of the proposed project are shown in Table 4.3-6. The project's average daily emissions of ozone precursor pollutants (i.e. ROG and NO<sub>x</sub>) would exceed the BAAQMD thresholds. As a result, the project could impact the region's

TABLE 4.3-6 DAILY REGIONAL AIR POLLUTANT EMISSIONS (POUNDS PER DAY)

Description	Reactive Organic Gases	Nitrogen Oxides	Particulate Matter (PM <sub>10</sub> )
2010 Maximum Daily			
Weekday	77.8	84.2	58.6
Saturday	96.8	105.4	75.8
<b>Average Day – 2010<sup>a</sup></b>	<b>83 lbs</b>	<b>90 lbs</b>	<b>64 lbs</b>
BAAQMD Significance Thresholds	80 lbs	80 lbs	80 lbs

Note: Includes both area and mobile sources associated with project land use descriptions.

<sup>a</sup> These calculations assume Saturday and Sunday emissions are similar.

effort to attain and maintain the ozone ambient air quality standards, which would have a *significant* impact on regional air quality.

4. Expose sensitive receptors to substantial pollutant concentrations.

a. Construction Impacts

The project construction period would likely occur over a two-year period. This construction activity would likely include initial grading of the site, however grading is not expected to be substantial since much of the site contained the former middle school buildings that have been demolished. Pollutant emissions would likely be generated from the following list of construction activities: construction worker travel to and from project sites, grading, delivery and hauling of construction supplies and debris to and from the project site, fuel combustion by on-site construction equipment, and fugitive emissions from dust, paints and solvents. These construction activities would be temporary. Particulate Matter 10 (PM<sub>10</sub>)

PM<sub>10</sub> is typically the most substantial source of air pollution from construction, particularly during site preparation and grading. PM<sub>10</sub> emissions from construction can vary daily, depending on various factors, such as the level of activity, type of construction activity taking place, the equipment being operated, weather conditions, and soil conditions. Sensitive receptors potentially affected by air pollutant emissions from project construction activities are users of the skate park and staff and users of the pool, and possibly users at the Fairgrounds such as Live Oak Charter School staff and students. Winds in Petaluma are typically from the northwest. So much these receptors would be upwind of the site much of the time.

Typically, the BAAQMD does not require quantitative analysis of construction emissions. Rather the analysis is focused on identifying the most appropriate control measures. The BAAQMD has identified a set of feasible PM<sub>10</sub> control measures for construction activities. If the project does not

comply with these control measures, there would be a *significant* impact associated with PM<sub>10</sub> during construction.

b. Toxic Air Contaminants (TACs)

Exhaust from construction equipment and associated heavy-duty truck traffic emits DPM, which is a known TAC. The BAAQMD has not developed any procedures or guidelines for identifying these impacts from temporary construction activities where emissions are transient. They are typically evaluated for stationary and mobile sources (e.g. large compression ignition engines such as generators) in health risk assessments that evaluate lifetime exposures (i.e. 24 hours per day over 70 years). The skate park and swim center would be adjacent to truck and vehicle access; however, truck trips would be infrequent most of the time and users are not occupying these facilities for extended periods during which they would be adversely exposed to air pollutants. Sensitive uses at the Fairgrounds, including Live Oak Charter School, are located approximately 1,000 feet away from the construction site and would not be affected by these emissions. In addition, winds in the area rarely blow from the project site toward the school (an easterly direction). Furthermore, construction activities are expected to occur during a relatively short time, and the City's General Plan policies require controls on construction equipment exhaust. Policy 4-P-16, as identified in Table 4.3-2, specifically establishes several requirements to reduce construction equipment exhaust that are not contained in the BAAQMD's list of feasible PM<sub>10</sub> control measures.

Based on the distances from the project site to sensitive receptors, the temporary nature of construction, and the City's policies to minimize combustion emissions, potential impacts from TACs would be *less than significant*.

5. Create objectionable odors affecting a substantial number of people.

Restaurant uses allowable under the project could produce odors during the preparation of food. Reaction to cooking odors varies widely with individuals. Some people find them objectionable, while others find them pleasant. Odors are diluted with distance from the source. Winds are typically from the northwest or southeast, so any odors generated by the project would typically occur to the southeast or northwest of the proposed project. Because residences are not located in close proximity to the project site, complaints regarding odors from the proposed project are not anticipated. The impact of odors generated by the proposed project would, therefore, be *less than significant*.

6. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

Development of the proposed project would contribute to greenhouse gas emissions due to energy use associated with the manufacture and transport of construction materials and directly from construction activities. Development of the proposed project would also directly result in increases in

energy consumption associated with buildings and motor vehicle use, although the net change in greenhouse gas emissions is difficult to determine, since project customers and workers already live and work somewhere, thus generating greenhouse gas emissions elsewhere.

Based on guidance provided by the California Air Pollution Officers Association (CAPCOA), CO<sub>2</sub> emissions are estimated using the URBEMIS2007 Model, which is based on projected new vehicle trips and area sources. Indirect source emissions from electricity usage were based on rates recommended by the California Climate Action Registry General Reporting Protocol (CCAR) and electricity emission rates recommended by the US EPA. Emissions associated with the project are reported in Table 4.3-7.

Under a “Business As Usual” scenario that would not include site features to help reduce CO<sub>2</sub> reduction, the project would emit approximately 17,910 tons of CO<sub>2</sub> per year to the atmosphere. This represents a worst case scenario. However, because of features either included in the project or those required by General Plan policies (identified in Table 4.3-2) construction of the project would result in lower emissions, as shown on Table 4.3-7. These features include, but are not limited to, pedestrian linkages, connections to local transit service, and bike lanes. Through the inclusion of these features, project emissions would be reduced by about 13 percent.

It should be noted that the URBEMIS2007 model does not assume any future increase in fuel efficiency in the vehicle fleet. Fuel efficiency is regulated by the U.S. Department of Transportation and current CARB regulations to address climate change. Newer fuel standards would increase light-duty automobile and light-duty truck fuel efficiency by about 10 miles per gallon (to 35 miles per gallon in 2020). CARB proposes more efficient standards as part of the State’s efforts to reduce GHG emissions. These standards would apply to new vehicles sold, and therefore, would gradually effect the overall fleet as these new vehicles replace older vehicles. Unfortunately, the CO<sub>2</sub> emissions estimates for vehicle travel do not accurately reflect future conditions for two main reasons: 1) CARB’s EMFAC model has not been updated to account for new standards; and 2) regulations to further increase fuel efficiency in California have not been approved at the Federal level (i.e., EPA has not issued a waiver to the State). As a result, it is likely that CO<sub>2</sub> emissions with a more fuel-efficient vehicle fleet would be lower than the estimate shown in Table 4.3-7.

In addition, emissions from electricity usage are anticipated to decrease substantially as the state shifts to more sources of electricity generation that does not emit GHGs (e.g., wind and solar power) compared to power plants fueled by natural gas, or other carbon-based fuels. The emission calculations are based on current emission rates for electricity production in the Northern California PG&E grid and do not include anticipated reductions of GHGs from the alternative energy sources.

TABLE 4.3-7 **PROJECTED ANNUAL GREENHOUSE GAS EMISSIONS**

Source	Proposed Project – Business as Usual (Tons/Year)	Mitigated Proposed Project (General Plan Policies) (Tons/Year)
Vehicle traffic	14,076	12,470
Area sources	794	636
Electricity usage	3,040	2,432
<b>Total</b>	<b>17,910</b>	<b>15,538</b>

Source: Illingworth & Rodkin, November 2008.

Without further efforts to reduce potential GHG emissions, construction and operation of the project would result in a *significant impact* on GHG emissions.

7. Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

Construction of the project would not conflict with State planning efforts to control GHG emissions. Please refer to the discussion under #8 above for the consistency with the City’s General Plan policies addressing climate change.

## 2. Cumulative Impacts

### a. Criteria Air Pollutants

Cumulative air quality impacts are considered as a part of the project-level analysis discussed above since future traffic projections used for the air quality analysis were generated by a cumulative traffic model. In addition, review of the project for consistency with the regional air quality plan takes into consideration the cumulative nature of the air quality plan, which is based on area-wide growth assumptions. Cumulative impacts are also considered on the basis of whether the project would contribute to green house gas (GHG) emissions, in combination with other projects in the City and region.

As discussed in the project-level analysis within this chapter, air emissions during the construction period would result in temporary significant impacts. However, with mitigation measures in place, these could be mitigated to a less-than-significant level. During the operational phase, the project would result in direct and indirect air emissions that would be significant in relation to BAAQMD air quality thresholds. The inconsistency with the regional clean air plan would be temporary in that the regional plan would be updated to account for this project and others identified in the proposed 2025 General Plan. However, until such as a time as the clean air plan is updated, and this

project is reflected in the regional growth assumptions, this represents an inconsistency. Due to the exceedance of the BAAQMD thresholds and the inconsistency with the clean air plan, the project would have a *significant* cumulative impact.

b. Cumulative Green House Gas emissions

The impacts of a project on global climate change are meaningful at the cumulative rather than individual project level. Even a very large individual project would not generate enough greenhouse gas emissions to influence global climate change. Construction and operation of the project, in combination with other projects occurring in Petaluma, could contribute to levels of greenhouse gas emissions and global warming. This impact would be on a global level.

Although no standard of cumulative significance has been established, construction of the project would contribute to cumulative greenhouse gas impacts.

As noted above, the General Plan EIR found that under cumulative buildout conditions, growth in the City would result in a significant and unavoidable impact with respect to GHG emissions, even with the inclusion of mitigation measures. The General Plan policies require the City to further inventory GHG emissions then seek ways to further reduce those emissions. That process is currently being conducted. In addition, implementation of Mitigation Measure AQ-1 and AQ-4, below, would result in a less than significant impact from project construction and operation on GHG emissions. Therefore, construction of the project would not result in a cumulatively considerable incremental contribution to global climate change over what was considered in the General Plan EIR.

*G. Impacts and Mitigation Measures*

**Impact AQ-1:** Although the project is accounted for in the City's new General Plan, the project exceeds the level of development anticipated in the regional clean air plan (*2005 Ozone Strategy*), which was based on the City's previous General Plan and its less-intense development assumptions. This is considered to be a *significant* impact.

Mitigation Measure AQ-1: The project applicant should reduce air pollutant emissions from both traffic trips and area sources through the measures listed below.

- ◆ Bicycle amenities should be provided for the project, including secure bicycle parking for retail employees, bicycle racks for retail customers, and bike lane connections to the site.
- ◆ Pedestrian facilities should include easy access and signage to bus stops and roadways that serve the major site uses (e.g. retail and office uses).

- ◆ Project site employers should be required to promote transit use by providing transit information and incentives to employees.
- ◆ Provide exterior electrical outlets to encourage use of electrical landscape equipment at retail and office uses.
- ◆ Prohibit idling of trucks at loading docks for more than 5 minutes per State law and include signage indicating such a prohibition.
- ◆ Provide 110- and 220-volt electrical outlets at loading docks.
- ◆ Implement a landscape plan that provides shade trees along pedestrian pathways.

Significance After Mitigation: The City's 2025 General Plan accounts for development of this project. The current regional Clean Air Plan (CAP) would eventually be updated to include the level of development occurring under this project. Approval of the project prior to adoption of the Clean Air Plan update would technically result in an inconsistency with regional clean air planning assumptions. This would be a *significant and unavoidable* impact. It should be noted that the project modeling had already included a reduction of about 11 percent due to project features that would reduce vehicle trips and area source emissions, and proximity of existing transit. Implementation of the mitigation measures above would reduce ozone precursor and PM<sub>10</sub> emissions by at least another 4 pounds per day; however, it would not reduce the impact to a less-than-significant level.

**Impact AQ-2:** Construction activity would generate air pollutant emissions that could expose sensitive receptors to substantial pollutant concentrations. This is a *significant* impact.

Mitigation Measure AQ-2: The following is a list of feasible control measures that the BAAQMD recommends to limit construction emissions of PM<sub>10</sub> so that impacts are less than significant. These mitigation measures should be implemented for all construction activity on the site.

- ◆ Water all active construction areas at least twice daily and more often during windy periods.
- ◆ Cover all hauling trucks or maintain at least 2 feet of freeboard. Dust-proof chutes should be used as appropriate to load debris onto trucks during demolition.
- ◆ Pave, apply water at least twice daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas.
- ◆ Sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas and sweep streets daily (with water sweepers) if visible soil material is deposited onto the adjacent roads.

- ◆ Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (i.e. previously-graded areas that are inactive for 10 days or more).
- ◆ Enclose, cover, water twice daily, or apply (non-toxic) soil binders to exposed stockpiles.
- ◆ Limit traffic speeds for construction vehicles on any unpaved roads to 15 mph.
- ◆ Replant vegetation in disturbed areas as quickly as possible.
- ◆ Suspend construction activities that cause visible dust plumes to extend beyond the construction site.
- ◆ Limit the area subject to excavation, grading and other construction activity at any one time.
- ◆ During demolition activities, removal or disturbance of any materials containing asbestos or other hazardous pollutants will be conducted in accordance with BAAQMD rules and regulations.
- ◆ Opacity is an indicator of exhaust particulate emissions from off-road diesel powered equipment. The project should ensure that emissions from all construction diesel powered equipment used on the project site do not exceed 40 percent opacity for more than three minutes in any one hour. Any equipment found to exceed 40 percent opacity (or Ringelmann 2.0) should be repaired immediately. This measure means that any equipment with continuous dark exhaust would be in violation of the requirement.
- ◆ Post signs at construction sites indicating the State regulations prohibiting excessive idling (of more than five minutes). Diesel equipment standing idle for more than five minutes shall be turned off, with exceptions listed under the regulation. This would include trucks waiting to deliver or receive soil, aggregate or other bulk materials. Rotating drum concrete trucks could keep their engines running continuously as long as they were on-site and away from residences or the swim center.

Significance After Mitigation: Implementation of these mitigation measures would reduce this impact to a *less-than-significant* level.

**Impact AQ-3:** The project would generate new emissions that would affect long-term air quality. A majority of the emissions generated by full buildout of the project would be produced by traffic. This would be a *significant* impact.

Mitigation Measure AQ-3: The project applicant should implement the measures identified in Mitigation Measure AQ-1.

Significance After Mitigation: While implementation of these mitigation measures would reduce ozone precursor and PM<sub>10</sub> emissions. However, the measure would not reduce emissions below the BAAQMD thresholds. As a result, the air quality impact would be *significant and unavoidable*.

**Impact AQ-4:** The project, in combination with other projects occurring in the City of Petaluma, could contribute to increased levels of greenhouse gas (GHG) emissions that cumulatively contribute to global warming. An increase in GHG emissions could conflict with the effort to achieve the reduction targets established by the City of Petaluma and AB 32 to reduce such emissions.

Mitigation Measure AQ-4: In addition to Mitigation Measure AQ-1, the Project Applicants and the City shall implement the following measures to reduce GHG emissions:

- ◆ The project shall obtain LEED certification. The proposed project will be built in accordance with Green Building standards that would reduce energy-related GHG emissions by at least 20 percent from those that would occur under current Title 24 Building Code requirements.<sup>8</sup> The applicant shall present these to the City prior the issuance of a building permit.
- ◆ As required by the General Plan, the applicant shall incorporate features to reduce energy related GHG emissions including, but not limited, to pedestrian linkages, connections to local transit, bike lanes, bike parking, and showers for employees.
- ◆ In addition to providing trees for shading, provide drought tolerant landscaping to reduce water usage.

Significance After Mitigation: With implementation of Mitigation Measures AQ-1 and AQ-4, GHG emissions would be reduced to levels well below those of traditional developments, and would be considered *less-than-significant*.

---

<sup>8</sup> The U.S. Green Building Council predicts that LEED certified buildings achieve 25 to 30% reductions, with greater reductions achieved for gold/platinum certifications. Given the design information currently available, a reduction of at least 20 percent is highly likely.

**CITY OF PETALUMA**  
**EAST WASHINGTON PLACE EIR**  
AIR QUALITY