

9

AIR QUALITY

The Air Quality chapter of the Environmental Impact Report (EIR) describes the potential impacts of the Bohemia Retail project (proposed project) on local and regional air quality. The chapter describes existing air quality, construction-related air quality impacts resulting from grading and equipment emissions, direct and indirect emissions associated with the proposed project, the impacts of these emissions on both the local and regional scale, and mitigation measures warranted to reduce or eliminate any identified significant impacts. This chapter is based on the *Placer County General Plan (PCGP)*,¹ the *PCGP EIR*,² the *Auburn/Bowman Community Plan (ABCP)*,³ *URBEMIS-2007 (Version 9.2.4)* (See Appendix J for URBEMIS-2007 outputs), *CALINE4* (See Appendix K for CALINE4 outputs), and the *Screening Health Risk Assessment for a Gasoline Fueling Facility at the Bohemia Retail Project, Placer County, California* (See Appendix L).⁴

It should be noted that all impacts related to air quality were identified as *potentially significant* in the Initial Study; therefore, the impacts are addressed in this chapter.

9.1 ENVIRONMENTAL SETTING

The following setting information provides an overview of the existing air quality setting in the proposed project area. In this section, the climate and topography of the region, ambient air quality standards (AAQS), attainment status for Placer County, current air quality, and sensitive receptors in the vicinity of the proposed project are discussed.

Climate and Topography

The proposed project site is located in western Placer County, which falls under the jurisdiction of the Sacramento Valley Air Basin (SVAB). Air flows into the SVAB through the Carquinez Strait, moving across the Delta, and bringing pollutants from the heavily populated San Francisco Bay Area. The climate is characterized by hot, dry summers and cool, rainy winters. Characteristic of SVAB winter weather are periods of dense and persistent low-level fog, which are most prevalent between storms. From May to October, the region's intense heat and sunlight lead to high ozone concentrations. The climate of Placer County is characterized by hot, dry summers and mild but wet winters. Prevailing winds are from the south and southwest, and as a result of prevailing winds coming generally from south to southwest, air quality in the area is heavily influenced by mobile and stationary sources of air pollution located upwind in the Sacramento Metropolitan Area.

Most precipitation in the SVAB results from air masses moving in from the Pacific Ocean during the winter months. Storms usually move through the area from the west or northwest. During the winter rainy season (November through February) over half the total annual precipitation falls while the average winter temperature is a moderate 49 degrees. During the summer, daytime

temperatures can exceed 100 degrees Fahrenheit. Dense fog occurs mostly in mid-winter and rarely in the summer. Daytime temperatures from April through October average between 70 and 90 degrees with extremely low humidity. The inland location and surrounding mountains shelter the valley from much of the ocean breeze that keeps the coastal regions moderate in temperature. The only breach in the mountain barrier is the Carquinez Strait, which exposes the midsection of the valley to the coastal air mass.

Air quality in Placer County is also affected by inversion layers, which occur when a layer of warm air traps a layer of cold air, preventing vertical dispersion of air contaminants. The presence of an inversion layer results in higher concentrations of pollutants near ground level. Summer inversions are strong and frequent, but are less troublesome than those that occur in the fall. Autumn inversions, formed by warm air subsiding in a region of high pressure, have accompanying light winds that do not provide adequate dispersion of air pollutants.

Air quality in the project vicinity is influenced by both local and distant emission sources. Air pollutant sources in the immediate project vicinity include emissions from vehicle traffic on SR 49, Luther Road, and Canal Street, as well as area sources such as nearby commercial and industrial developments.

Ambient Air Quality Standards

Both the U.S. Environmental Protection Agency (U.S. EPA) and the California Air Resources Board (CARB) have established AAQS for common pollutants. The AAQS for each contaminant represent safe levels that avoid specific adverse health effects. Pollutants for which air quality standards have been established are called “criteria” pollutants.

Table 9-1 identifies the major pollutants, characteristics, health effects and typical sources. The federal and State AAQS are summarized in Table 9-2. The federal and State AAQS were developed independently with differing purposes and methods. As a result, the federal and State AAQS differ in some cases. In general, California’s AAQS are more stringent, particularly for ozone and particulate matter (PM₁₀ and PM_{2.5}), than the federal AAQS.

Ozone

Ozone is the most prevalent of a class of photochemical oxidants formed in the urban atmosphere. The creation of ozone is a result of a complex chemical reaction between reactive organic gases (ROG) and nitrogen oxide (NO_x) gases in the presence of sunshine. Unlike other pollutants, ozone is not released directly into the atmosphere from any sources. Factories, automobiles, and evaporation of solvents and fuels are the major sources of ozone precursors. The health effects of ozone are difficulty breathing, lung tissue damage, and eye irritation.

**Table 9-1
Major Criteria Pollutants**

Pollutant	Characteristics	Health Effects	Examples of Sources
Ozone	A strong smelling, pale blue, reactive toxic chemical gas consisting of three oxygen atoms. Ozone exists in the upper atmosphere ozone layer (stratospheric ozone) as well as at the Earth's surface in the troposphere (ozone). Ozone in the troposphere causes numerous adverse health effects and is a criteria air pollutant, and is a major component of smog.	<ul style="list-style-type: none"> • Breathing difficulties • Lung tissue damage • Damage to rubber and some plastics • Eye and skin irritation 	Formed when reactive organic gases (ROG) and nitrogen oxides react in the presence of sunlight. ROG and NO _x sources include any source that burns fuels, (e.g., gasoline, natural gas, wood, oil) solvents, petroleum processing and storage and pesticides.
Carbon Monoxide	A colorless, odorless gas resulting from the incomplete combustion of hydrocarbon fuels. Over 80 percent of the carbon monoxide emitted in urban areas is contributed by motor vehicles.	<ul style="list-style-type: none"> • Chest pain in heart patients • Headaches and nausea • Reduced mental alertness • High concentration can result in death 	Any source that burns fuel such as automobiles, trucks, heavy construction equipment, farming equipment and residential heating.
Nitrogen Dioxide	Nitrogen dioxide is typically created during combustion processes, and is a major contributor to smog formation and acid deposition.	<ul style="list-style-type: none"> • Lung irritation and damage • Reacts in the atmosphere to form ozone and acid rain 	Any source that burns fuel such as automobiles, trucks, heavy construction equipment, farming equipment and residential heating.
Sulfur Dioxide	A strong smelling, colorless gas that is formed by the combustion of fossil fuels.	<ul style="list-style-type: none"> • Increased lung disease and breathing problems for asthmatics • Reacts in the atmosphere to form acid rain 	Coal or oil burning power plants and industries, refineries, and diesel engines.
Particulate Matter (PM ₁₀ and PM _{2.5})	Any material, except pure water, that exists in the solid or liquid state in the atmosphere. The size of particulate matter can vary from coarse, wind-blown dust particles to fine particle combustion products.	<ul style="list-style-type: none"> • Increased respiratory disease • Lung damage • Premature death • Reduced visibility 	Fuel combustion in motor vehicles, equipment and industrial sources, residential and agricultural burning. Particulate matter is also formed from reaction of other pollutants (acid rain, NO _x , SO _x , organics).

Source: California Air Resources Board, <http://www.arb.ca.gov/html/gloss.htm>, accessed June 2009.

Table 9-2 Ambient Air Quality Standards				
Pollutant	Averaging Time	California Standards	Federal Standards	
			Primary	Secondary
Ozone	1 Hour	0.09 ppm	-	Same as primary
	8 Hour	0.07 ppm	0.075 ppm	
Carbon Monoxide	8 Hour	9 ppm	9 ppm	None
	1 Hour	20 ppm	35 ppm	
Nitrogen Dioxide	Annual Mean	0.03 ppm	0.053 ppm	Same as primary
	1 Hour	0.18 ppm	-	
Sulfur Dioxide	Annual Mean	-	0.030 ppm	-
	24 Hour	0.04 ppm	0.14 ppm	-
	3 Hour			0.50 ppm
	1 Hour	0.25 ppm		-
Respirable Particulate Matter (PM₁₀)	Annual Mean	20 ug/m ³	-	Same as primary
	24 Hour	50 ug/m ³	150 ug/m ³	
Fine Particulate Matter (PM_{2.5})	Annual Mean	12 ug/m ³	15 ug/m ³	Same as primary
	24 Hour	-	35 ug/m ³	
Sulfates	24 Hour	25 ug/m ³	-	-
Lead	30 Day Average	1.5 ug/m ³	-	-
	Calendar Quarter	-	1.5 ug/m ³	Same as primary
Hydrogen Sulfide	1 Hour	0.03 ppm	N/A	N/A
Vinyl Chloride	24 Hour	0.01 ppm	N/A	N/A
ppm = parts per million ug/m ³ = micrograms per cubic meter <i>Source: California Air Resources Board, http://www.arb.ca.gov/research/aaqs/aaqs2.pdf, accessed June 2009.</i>				

Particulate Matter

Suspended particulate matter (airborne dust) consists of solid and liquid particles small enough to remain suspended in the air for long periods. “Respirable” particulate matter (PM) consists of particles less than 10 microns in diameter, and is defined as “suspended particulate matter” or PM₁₀. Particles between 2.5 and 10 microns in diameter arise primarily from natural processes, such as wind-blown dust or soil. Fine particles are less than 2.5 microns in diameter (PM_{2.5}). PM_{2.5}, by definition, is included in PM₁₀. Fine particles are produced mostly from combustion or burning activities. Fuel burned in cars and trucks, power plants, factories, fireplaces, and wood stoves produce fine particles.

Particulate matter is a complex mixture that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These tiny particles vary greatly in shape, size, and chemical composition, and can be made up of many different materials such as metals, soot, soil, and dust. Particulate matter is divided into two classes, primary and secondary. Primary particles are released directly into the atmosphere from sources of generation. Secondary particles are formed in the atmosphere as a result of reactions involving gases.

Particles greater than 10 microns in diameter can cause irritation in the nose, throat, and bronchial tubes. Natural mechanisms remove many of these particles, but smaller particles are able to pass through the body's natural defenses, including the mucous membranes of the upper respiratory tract, and enter into the lungs. The particles can damage the alveoli, tiny air sacs responsible for gas exchange in the lungs. The particles may also carry carcinogens and other toxic compounds, which adhere to the particle surfaces and can enter the lungs.

Carbon Monoxide

Carbon monoxide (CO) is a colorless, odorless, poisonous gas produced by incomplete burning of carbon-based fuels such as gasoline, oil, and wood. When CO enters the body, the CO combines with chemicals in the body, which prevents blood from carrying oxygen to cells, tissues, and organs. Symptoms of exposure to CO can include problems with vision, reduced alertness, and general reduction in mental and physical functions. Exposure to CO can result in chest pain, headaches, reduced mental alertness, and death at high concentrations.

Nitrogen Oxide Gases

NO_x are produced from burning fuels, including gasoline and coal. Nitrogen oxides react with ROG (found in paints and solvents) to form ozone, which can harm health, damage the environment, and cause poor visibility. Additionally, NO_x emissions are a major component of acid rain. Health effects related to NO_x include lung irritation and lung damage.

Sulfates

Sulfates (SO_x) are colorless gases and constitute a major element of pollution in the atmosphere. SO_x is commonly produced by fossil fuel combustion. In the atmosphere, SO_x is usually oxidized by ozone and hydrogen peroxide to form sulfur dioxide and trioxide. If SO_x is present during condensation, acid rain may occur. Exposure to high concentrations for short periods of time can constrict the bronchi and increase mucous flow, making breathing difficult. Children, the elderly, those with chronic lung disease, and asthmatics are especially susceptible to these effects.

Toxic Air Contaminants

In addition to criteria pollutants, Toxic Air Contaminants (TACs) are a category of environmental concern. Many types of TACs exist, with varying degrees of toxicity. Sources of TACs include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. Cars and trucks release at least 40 different TACs. In terms of health risks, the most volatile contaminants are diesel particulate, benzene, formaldehyde, 1,3-butadiene and acetaldehyde.

Public exposure to TACs can result from emissions from normal operations as well as accidental releases. Health effects of TACs include cancer, birth defects, neurological damage, and death.

Naturally Occurring Asbestos

Naturally Occurring Asbestos (NOA) is found in some areas throughout California, most commonly where ultramafic rock or serpentinite rock is present. Because asbestos is a known carcinogen, naturally-occurring asbestos is considered a TAC. Asbestos includes fibrous minerals found in certain types of rock formations. Natural weathering or human disturbance could generate microscopic NOA fibers which are easily suspended in air. Placer County has been identified by the California Department of Conservation as an area where NOA is located.

As discussed in Chapter 11, Soils, Geology, and Seismicity, the project site and surrounding area are underlain by Paleozoic to Mesozoic metavolcanic rocks (greenstone) and ultramafic rocks (serpentine), which may contain NOA. These rocks are associated with NOA minerals such as chrysotile, actinolite, and tremolite. According to the *Geotechnical Engineering Report for the Proposed Bohemia Residential Development*, which was prepared in December 2004 for the previous EIR for the project site, the testing of samples collected on-site showed that, with the exception of a trace amount of chrysotile in one sample (less than one percent), mineralogic analysis did not reveal the presence of NOA.⁵

Attainment Status

The Federal Clean Air Act (CAA) and the California Clean Air Act (CCAA) require all areas of California to be classified as attainment, non-attainment, or unclassified as to their status with regard to the federal and/or State AAQS. The CAA and CCAA require that the CARB, based on air quality monitoring data, designate portions of the State where the federal or State AAQS are not met as “nonattainment areas.” Because of the differences between the national and State standards, the designation of nonattainment areas is different under the federal and State legislation. The CCAA requires local air pollution control districts to prepare air quality attainment plans. These plans must provide for district-wide emission reductions of five percent per year averaged over consecutive three-year periods or, provide for adoption of “all feasible measures on an expeditious schedule.”

Under the CAA, Placer County has been designated nonattainment for the ozone eight-hour standard and PM_{2.5}, and unclassified for other federal AAQS. In addition, Placer County is designated nonattainment for the State AAQS for ozone and PM₁₀, and attainment or unclassified for other pollutants (See Table 9-3). The entire State is currently designated unclassified for PM_{2.5} and will continue to be until sufficient monitoring data has been collected.

Current Air Quality

As stated above, air quality in the SVAB complies with most state and federal air quality standards, but the SVAB is designated a non-attainment area for ozone and PM₁₀ standards. Air quality is monitored for the portion of Placer County that is located within the SVAB by two active air pollutant monitoring stations. The air quality monitoring stations measure hourly pollutants and record sufficient data to meet EPA and/or ARB criteria for quality assurance. However, only monitoring data for ozone, PM₁₀, and PM_{2.5} are publicly available via the CARB website.

Pollutant	Federal Designation	State Designation
Ozone	Nonattainment	Nonattainment
Particulate Matter (PM ₁₀)	Unclassified	Nonattainment
Particulate Matter (PM _{2.5})	Nonattainment	Unclassified
Carbon Monoxide	Unclassified	Unclassified
Nitrogen Dioxide	Unclassified	Attainment
Sulfur Dioxide	Unclassified	Attainment
Sulfates	No Federal Standard	Attainment
Lead	No Federal Standard	Attainment
Hydrogen Sulfide	No Federal Standard	Unclassified
Visibility Reducing Particulates	No Federal Standard	Unclassified

Source: www.arb.ca.gov, accessed June 2009.

One air quality monitoring station is located at the DeWitt Center and only monitors ozone concentrations; the other is located in Roseville on North Sunrise Boulevard, and monitors ozone, PM₁₀, PM_{2.5}, CO, and nitrogen dioxide. A summary of the annual air quality measurements from the monitoring sites are shown in Tables 9-4 and 9-5, respectively.

Pollutant	Standard	Days Standard Was Exceeded		
		2006	2007	2008
Ozone	State 1-Hour	25	1	14
Ozone	State 8-hour	67	21	36
Ozone	Federal 8-Hour	56	9	21

Source: California Air Resources Board, Aerometric Data Analysis and Management (ADAM) System, accessed June 2009.

Pollutant	Standard	Days Standard Was Exceeded		
		2006	2007	2008
Ozone	State 1-Hour	16	4	20
Ozone	State 8-hour	38	20	38
Ozone	Federal 8-Hour	25	8	22
PM ₁₀	State 24-Hour	5.8	0	6.1
PM ₁₀	Federal 24-Hour	0	0	0
PM _{2.5}	24-Hour	11.5	0	6.5

Source: California Air Resources Board, ADAM System, accessed June 2009.

Sensitive Receptors

Some land uses are considered more sensitive to air pollution than others, due to the types of population groups or activities involved. Residential areas are considered to be sensitive to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present. Although exposure periods are generally short, exercising places a high demand on respiratory functions, which can be impaired by air pollution. The project site is located in an area characterized by existing residential land uses, and residences surround the project site on the north and east sides. In addition, a private park is located to the east of the project site. Development activities associated with implementation could expose existing residents to increased air pollutant levels.

9.2 REGULATORY SETTING

Air quality is monitored through the efforts of various federal, State, and local government agencies. These agencies work jointly and individually to improve air quality through legislation, regulations, planning, policy-making, education, and a variety of programs. In addition to federal, State, and local air quality standards, the proposed project will be evaluated in the context of policies related to air quality contained in the Auburn/Bowman Community Plan.

Federal

United States Environmental Protection Agency

The U.S. EPA is responsible for enforcement of the federal AAQS. The U.S. EPA has adopted policies requiring states to prepare State Implementation Plans (SIP) that demonstrate attainment and maintenance of the federal AAQS. After a review of the SIP, the U.S. EPA will further classify non-attainment areas according to an air district's projected date of attainment. Districts that project attainment of standards in three to five years would be classified as near-term non-attainment, whereas districts that cannot meet standards within five years would be classified as long-term non-attainment. For an area to be classified as near-term non-attainment, the district would be required to demonstrate that pollutant reductions of three-percent-per-year are obtainable and that maintenance of standards could occur for ten years.

In 1997, the U.S. EPA adopted new national air quality standards for ground-level ozone and for fine particulate matter (PM_{2.5}). These standards determined that the existing 1-hour ozone standard of 0.12 parts-per-million (ppm) would be phased out and replaced by an 8-hour standard of 0.08 ppm. New national standards for fine particulate matter (diameter 2.5 microns or less) were established for 24-hour and annual averaging periods.

The established PM₁₀ standards were retained, but the method and form for determining compliance with the standards were revised. Implementation of the new ozone and Particulate Matter standards was delayed by a lawsuit. On May 14, 1999 the Court of Appeals for the District of Columbia Circuit issued a decision ruling that the Clean Air Act as applied in setting the new public health standards for ozone and particulate matter was unconstitutional and an improper delegation of legislative authority to the Environmental Protection Agency. The United

States Supreme Court revised the District of Columbia Circuit's decision in 2001, clearing the way for implementation of the new standards. During the interim period, the California Clean Air Resources Board developed recommended designations for California air basins, proposing that Placer County be designated as non-attainment for the new 8-hour ozone standard. Designations for PM_{2.5} have not been made; however, a minimum three-year monitoring period is required.

State

California Air Resources Board (CARB)

The CARB is the agency responsible for coordination and oversight of State and local air pollution control programs in California and for implementing California's own air quality legislation, the CCAA, which was adopted in 1988. The CARB has primary responsibility in California to develop and implement air pollution control plans designed to achieve and maintain the NAAQS established by the U.S. EPA.

California Clean Air Act

The CCAA requires that air quality plans be prepared for areas of the State that have not met State air quality standards for ozone, CO, nitrogen dioxide (NO₂), and sulfur dioxide (SO₂). Areas that met standards by 1994 were classified as moderate, those that attained standards between 1994 and 1997 were classified as serious, and those that could not attain standards until after 1997 were classified as severe. In order to implement the transportation-related provisions of the CCAA, local air pollution control districts have been granted explicit authority to adopt and implement transportation controls.

Sacramento Area Regional Ozone Attainment Plan

Because the SVAB has been designated non-attainment with respect to federal ozone standards, the Sacramento Area Regional Ozone Attainment Plan, or the State Implementation Plan (SIP), was prepared by Air Quality Management Districts and Air Pollution Control Districts in the Sacramento region. Compliance with the SIP is intended to reduce ozone levels, particularly levels of ROG and NO_x. In order to reduce ROG and NO_x emissions, the SIP includes land use and transportation control measures for development projects.

Local

Placer County Air Pollution Control District

The PCAPCD adopts and enforces regulations to control emissions from stationary sources of air pollutants, while the CARB has the authority to regulate emissions from motor vehicles. Stationary sources include non-specific sources associated with typical operation of a land use (e.g., gasoline-powered lawn mowers or woodburning fireplaces), as well as individual pieces of equipment (e.g., power generators). Emissions from individual stationary sources are regulated

through a permit process, while emissions from non-specific sources are regulated during Placer County’s development approval process.

In order to evaluate stationary and area source emissions, the PCAPCD has established significance thresholds for emissions of ROG, NO_x, SO_x, PM₁₀, and CO. Should emissions from area or stationary sources exceed the thresholds, the PCAPCD requires application of Best Available Control Technology on both new and modified emissions sources. The significance thresholds, listed in Table 9-6, serve as air quality standards in the evaluation of air quality impacts associated with proposed development projects.

Table 9-6 Placer County Air Pollution Control District Standards		
Pollutant	Operational Threshold (lbs/day)	Cumulative Threshold (lbs/day)
ROG	82	10
NO _x	82	10
SO _x	82	N/A
PM ₁₀	82	N/A
CO	550	N/A

Source: Placer County Air Pollution Control District, 2009.

The significance thresholds are expressed in “pounds per day,” which allows for comparison between the thresholds and URBEMIS-2007 modeling results. Emissions attributable to the proposed project, as calculated by URBEMIS-2007, which exceed the significance thresholds could have a significant effect on regional air quality and the attainment of the federal and State AAQS. The significance thresholds apply to both short-term and long-term air pollutant emissions. Pursuant to the standards of significance, any project that is determined to have the potential to generate emissions exceeding the thresholds would have a significant impact on air quality.

Auburn/Bowman Community Plan

The following are applicable Auburn/Bowman Community Plan goals and policies related to air quality:

Environmental Resources Management Element

Air Quality

- Goal 1 Protect and improve air quality in the Auburn area.
- Goal 2 Assure Placer County’s compliance with State and federal air quality standards.
- Policy 1 Consider only area plan alternatives and later amendments that reduce emissions to their lowest practical levels.

- Policy 2 Plans under consideration shall contemplate smooth flowing traffic systems for major arteries. This includes traffic signal coordination, parallel roadways and intra-neighborhood connectors where significant reductions in overall emissions can be achieved.
- Policy 3 Continue the use of the Traffic Management Combining Zone (-TM) and expand it to include synchronization of traffic signals on Highway 49 and similar arteries susceptible to emissions improvement through approach/control.
- Policy 4 Implement precise zoning which provides the opportunity for an improved jobs-housing balance.
- Policy 6 Use Direct Source Review as outlined in the EIR for the Plan to reduce emissions from existing land uses.
- Policy 7 Produce mitigations for air quality impacts associated with adoption of the Community Plan and include them in the monitoring plan.
- Policy 8 Utilize zoning regulations to provide a buffer between industrial and residential land uses.
- Policy 9 Projects which result in 200 or more trip-ends may require an air quality analysis to be submitted for review and approval.
- Policy 10 Actively participate in the Air Pollution Control District's Transportation Control Measures (TCM) program to reduce vehicle trips and miles travelled within the Plan area.

8.3 IMPACTS AND MITIGATION MEASURES

Standards of Significance

For the purposes of this EIR, the following standards of significance were adapted from Appendix G of the CEQA Guidelines. Impacts are considered significant if implementation of the proposed project would do one or more of the following:

- Exceed the following PCAPCD significance thresholds, which apply to both the construction and operation of a project, for regional emissions:
 - Reactive Organic Gases (ROG) – 82 lbs/day;
 - Nitrogen Oxides (NO_x) – 82 lbs/day;

- Particulate Matter (PM₁₀) – 82 lbs/day;
- Carbon Monoxide (CO) – 550 lbs/day;
- Generate localized concentrations of CO that exceed the 1-hour 20 ppm or the 8-hour 9 ppm air quality standards;
- Result in a cumulatively considerable net increase of any criteria for which the project region is non-attainment under an applicable federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

Method of Analysis

The following section discusses the methods utilized to determine the project's impacts.

Short-Term Impacts

Short-term construction emissions of ROG and NO_x were estimated using the URBEMIS-2007 (Version 9.2.4) computer program. The URBEMIS-2007 program is designed to model construction emissions for land use development projects and allows for the input of project-specific information. For development sites greater than 10 acres, URBEMIS modeling default parameters assume that one-quarter of the project area could be constructed on any given day. To ensure a conservative analysis, modeling was based on the maximum estimated area of daily disturbance, based on a comparison of data provided by the project applicant and the default parameters contained in the URBEMIS-2007 model. Construction schedules were based on estimated construction schedules provided by the project applicant. Construction is anticipated to occur in one phase, over an approximate 30-month period, with demolition of existing paved areas on-site lasting for approximately six months, grading of the site lasting for approximately 24 months, roadway paving being completed in approximately two months, and building construction lasting for approximately 12 months. In addition, an estimated 70,000 cubic yards of soil would be exported from the site over approximately 30 days. All other modeling parameters, including equipment usage requirements, were based on URBEMIS-2007 model defaults.

Long-Term Impacts

Regional area- and mobile-source emissions associated with the proposed project were estimated using the URBEMIS-2007 computer program, which includes options for the estimation of operational emissions for land use development projects. Emissions were calculated for both summer and winter conditions based on the default parameters contained in the model. Default trip generation rates contained in the model were revised to correspond with predicted trip generation rates identified in the traffic analysis prepared for this project, and pass-by trips were included. It should be noted that 2013 is the year that was input as the project buildout year for the purposes of the URBEMIS-2007 modeling. It should also be noted that the potential user(s) associated with the proposed project could include a discount club store, discount superstore, or a general retailer. Because specific tenants have not yet been identified, this EIR evaluates two

project options – a discount club store and a discount superstore – in order to evaluate the potential environmental impacts resulting from a range of uses.

Screening Health Risk Assessment

A screening health risk assessment was conducted for the project utilizing the procedures and emission factors defined in California Air Pollution Control Officers' *Air Toxics "Hot Spots" Program Gasoline Service Station Industry-wide Risk Assessment Guidelines*.⁶ Using the project site plan and aerial photographs of the project environs, the distance between the center of the proposed gasoline facility and the nearest sensitive receptors was estimated.

The CAPCOA procedures provide a very conservative estimate of cancer risk per million gallons of gasoline pumped based on distance from the facility using results of the ISCST-3 dispersion model and hypothetical worst-case meteorological conditions as defined by the SCREEN-3 dispersion model. The only inputs required for the CAPCOA risk calculation are the distance from the gasoline facility to the receptor, identification of the type of emission control equipment that will be utilized, and a determination as to whether the surrounding neighborhood would be considered urban or rural. With these inputs, a conservative estimate of benzene concentration and the resulting risk can be obtained from tables and graphs. The risk is expressed as excess cancer risk per million gallons throughput. Because concentration is directly proportional to throughput, risks for any throughput can be estimated by multiplying the risk per million gallons by the desired throughput.

The estimated risk from the CAPCOA risk calculation is based on a continuous 24-hour a day exposure over a 70-year lifetime, typically termed the exposure of the Maximum Exposed Individual (MEI). The CAPCOA document recommends that adjustments to this risk calculation be made for other types of exposure.

As stated earlier, all air quality impacts were identified as *potentially significant* within the Initial Study and are addressed below.

Project-Specific Impacts and Mitigation Measures

9-1 Impacts related to fugitive particulate matter emissions and the release of NOA associated with project construction activities.

Fugitive Particulate Matter

Maximum construction emissions would occur during the first stages of construction when clearing, earthmoving, and grading occur. Table 9-7 shows the expected maximum daily construction emissions for the project without the incorporation of mitigation. As shown in Table 9-7, PM₁₀ emissions generated by the project would exceed the PCAPCD significance threshold. In addition, particulate matter emitted during construction activities would occur near existing residences, thereby causing a nuisance. Residences currently exist to on the north and east sides of the project site.

Table 9-7 Maximum Construction-Related Daily Emissions of PM₁₀ (Unmitigated)	
	PM₁₀
Project Construction	121.72 lbs/day
PCAPCD Significance Threshold	82.0 lbs/day

Source: Raney Planning & Management, Inc., May 2009.

The majority of the PM₁₀ from construction would be soil particles (grading and earthmoving on-site causes soil particles to become airborne), while a small fraction (approximately one percent) of the PM₁₀ would be from diesel exhaust (during construction, various diesel-powered vehicles and equipment would be used on the site). Diesel exhaust particulate is a pollutant that has come under increased scrutiny in recent years. The CARB has identified PM from diesel-fueled engines as a TAC. The CARB has completed a risk management process that identified potential cancer risks for a range of activities using diesel-fueled engines. High volume freeways, stationary diesel engines, and facilities attracting heavy and constant diesel vehicle traffic were identified as having the highest associated health risks. Health risks from TACs are a function of both the concentration of emissions and the duration of exposure. The emissions resulting from construction are temporary, affecting a specific receptor for a period of days or perhaps weeks. Emissions from diesel powered equipment on the site would be spread over the site and would not affect any specific receptor for an extended period of time.

Naturally Occurring Asbestos

If on-site rocks contain asbestos, grading and construction activities could release asbestos fibers into the environment, if not properly controlled. The “Asbestos Airborne Toxic Control Measure (ATCM) for Construction, Grading, Quarrying, and Surface Mining Operations” was developed to prevent hazardous situations resulting from earth disturbance in areas containing NOA. For projects that could create a hazardous situation through disturbance of asbestos-containing rocks, the ATCM requires an Asbestos Dust Mitigation Plan, which is subject to the reviewed and approval of the PCAPCD. The Asbestos ATCM requires dust control practices in areas where asbestos is found or likely to be found. Rule 228, Fugitive Dust, enforced by the PCAPCD, also contains measures to protect against exposure to airborne NOA.

The geotechnical report prepared for the project site in 2004 indicates that, with the exception of a trace amount of chrysotile in one sample (less than one percent), NOA was not present on-site, and mineralogic analysis did not reveal the presence of NOA (See Appendix N). However, although unlikely, the potential still exists for airborne NOA to result in adverse impacts to sensitive receptors during construction activities.

Conclusion

Because the construction activities associated with the proposed project would generate PM₁₀ emissions at a level that would exceed the PCAPCD’s significance threshold, and

because the project could result in the release of NOA into the air, **potentially significant** short-term impacts would occur.

Mitigation Measure(s)

The PCAPCD provides recommended mitigation measures to reduce impacts related to short-term emissions of pollutants that would be associated with construction of a project. Implementation of the following recommended mitigation measures would reduce emissions of PM₁₀ such that the project would result in a *less-than-significant* impact from construction-related fugitive dust emissions and NOA.

9-1(a) *Prior to the approval of Improvement Plans, the applicant shall submit:*

- i. *A Construction Emission/Dust Control Plan to the PCAPCD. This plan must address the minimum Administrative Requirements found in Sections 300 and 400 of PCAPCD Rule 228, Fugitive Dust. The applicant shall not break ground prior to receiving PCAPCD approval of the Construction Emission/Dust Control Plan. The following link shall be used to calculate compliance with this condition and shall be submitted to the PCAPCD as described above:*

<http://www.airquality.org/ceqa/ConstructionEmissionsMitigationCalculatorv6o03-2007March09.xls>

- ii. *A comprehensive inventory (i.e., make, model, year, emission rating) of all the heavy-duty off-road equipment (50 horsepower or greater) that will be used an aggregate of 40 or more hours for the construction project. The inventory shall be updated, beginning 30 days after any initial work on-site has begun, and shall be submitted on a monthly basis throughout the duration of the project, except that an inventory shall not be required for any 30-day period in which no construction activity occurs. At least three business days prior to the use of subject heavy-duty off-road equipment, the project representative shall provide the PCAPCD with the anticipated construction timeline including start date, and name and phone number of the property owner, project manager, and on-site foreman.*
- iii. *A written calculation to the PCAPCD for approval by the PCAPCD demonstrating that the heavy-duty (50 horsepower or greater) off-road vehicles to be used in the construction project, including owned, leased and subcontractor vehicles, will achieve a project wide fleet-average 20 percent NO_x reduction and 45 percent particulate reduction as required by CARB. Acceptable options for reducing emissions may include use of late model engines, low-emission diesel products, alternative fuels, engine*

retrofit technology, after-treatment products, and/or other options as they become available. The following link shall be used to calculate compliance with this condition and shall be submitted to the PCAPCD as described above:

<http://www.airquality.org/ceqa/ConstructionEmissionsMitigationCalculatorv6o03-2007March09.xls>

- 9-1(b) *Prior to the approval of Improvement Plans, the applicant shall include the following standard note on the Improvement/Grading Plan: The contractor shall suspend all grading operations when fugitive dust exceeds PCAPCD Rule 228 (Fugitive Dust) limitations. The prime contractor shall be responsible for having an individual who is CARB-certified to perform Visible Emissions Evaluations (VEE). This individual shall evaluate compliance with Rule 228 on a weekly basis. It is to be noted that fugitive dust is not to exceed 40% opacity and not go beyond property boundary at any time. If lime or other drying agents are utilized to dry out wet grading areas they shall be controlled as to not to exceed PCAPCD Rule 228 Fugitive Dust limitations.*
- 9-1(c) *Prior to the approval of Improvement Plans, the applicant shall include the following standard note on the Improvement/Grading Plan: The prime contractor shall suspend all grading operations when wind speeds (including instantaneous gusts) exceed 25 miles per hour and dust is impacting adjacent properties.*
- 9-1(d) *Prior to the approval of Improvement Plans, the applicant shall include the following standard note on the Improvement/Grading Plan: Construction equipment exhaust emissions shall not exceed PCAPCD Rule 202 Visible Emission limitations. Operators of vehicles and equipment found to exceed opacity limits are to be immediately notified to cease operations and the equipment must be repaired within 72 hours. Additional information regarding Rule 202 can be found at: <http://www.placer.ca.gov/Departments/Air/Rules.aspx>.*
- 9-1(e) *Prior to the approval of Improvement Plans, the applicant shall include the following standard note on the Improvement/Grading Plan: During construction, no open burning of removed vegetation shall be allowed. All removed vegetative material shall be either chipped on-site or taken to an appropriate disposal site.*
- 9-1(f) *Prior to the approval of Improvement Plans, the applicant shall include the following standard note on the Improvement/Grading Plan: The prime contractor shall be responsible for keeping adjacent public thoroughfares clean of silt, dirt, mud, and debris, and shall “wet broom” if silt, dirt, mud*

or debris is carried over to adjacent public thoroughfares. Dry mechanical sweeping is prohibited.

9-1(g) *Prior to the approval of Improvement Plans, the applicant shall include the following standard note on the Improvement/Grading Plan: During construction, traffic speeds on all unpaved surfaces shall be limited to 15 miles per hour or less.*

9-1(h) *Prior to the approval of Improvement Plans, the applicant shall include the following standard note on the Improvement/Grading Plan: The contractor shall apply water to control dust, as required by PCAPCD Rule 228, Fugitive Dust, to prevent dust impacts off-site. Operational water truck(s), shall be on-site, at all times, to control fugitive dust. Construction vehicles leaving the site shall be cleaned to prevent dust, silt, mud, and dirt from being released or tracked off-site.*

9-2 Impacts related to a temporary increase in NO_x emissions.

Nitrogen oxides are ozone precursors and, as such, could contribute to the creation of smog within the SVAB. Construction-generated emissions of NO_x are short-term and of temporary duration, lasting only as long as construction activities occur, but possess the potential to represent a significant air quality impact. The development of the proposed land uses would result in the temporary generation of emissions resulting from vehicles associated with site grading and excavation, road paving, building construction, worker trips, and the movement of construction equipment.

As shown in Table 9-8, construction of the project would be expected to generate approximately 12.99 pounds per day of ROG emissions, which would not exceed the PCAPCD significance threshold of 82.0 pounds per day. However, vehicles and equipment associated with the construction of the proposed project would emit up to 148.29 pounds per day of NO_x. Therefore, construction emissions associated with buildout of the project would exceed the PCAPCD significance threshold of 82.0 pounds per day for NO_x. As a result, implementation of the proposed project would result in a *significant* impact.

	ROG	NO_x
Discount Club Store	12.99	148.29
Discount Superstore	12.99	148.29
PCAPCD Significance Threshold	82.0 lbs/day	82.0 lbs/day

Source: Raney Planning & Management, Inc., May 2009.

Mitigation Measure(s)

The following mitigation measure would reduce the short-term NO_x emissions associated with construction of the proposed project. However, implementation of feasible

mitigation would not reduce the project's short-term NO_x emissions below the PCAPCD's significance threshold; therefore, the project would result in a short-term *significant and unavoidable* impact.

- 9-2(a) *Implement Mitigation Measure 9-1(a).*
- 9-2(b) *Prior to approval of Improvement Plans, an enforcement plan shall be established, and submitted to the PCAPCD for review, in order to weekly evaluate project-related on- and off-road heavy-duty vehicle engine emission opacities, using standards as defined in California Code of Regulations, Title 13, Sections 2180–2194. An Environmental Coordinator, CARB-certified to perform Visible Emissions Evaluations (VEE), shall routinely evaluate project-related off-road and heavy duty on-road equipment emissions for compliance with this requirement. Operators of vehicles and equipment found to exceed opacity limits will be notified and the equipment must be repaired within 72 hours.*
- 9-2(c) *Prior to the approval of Improvement Plans, the applicant shall include the following standard note on the Improvement/Grading Plan: During construction, the contractor shall minimize idling time to a maximum of five minutes for all diesel powered equipment.*
- 9-2(d) *Prior to the approval of Improvement Plans, the applicant shall include the following standard note on the Improvement/Grading Plan: The contractor shall use CARB ultra low diesel fuel for all diesel-powered equipment. In addition, low sulfur fuel shall be utilized for all stationary equipment.*
- 9-2(e) *Prior to the approval of Improvement Plans, the applicant shall include the following standard note on the Improvement/Grading Plan: The contractor shall utilize existing power sources (e.g., power poles) or clean fuel generators rather than temporary power generators.*
- 9-2(f) *Prior to the approval of Improvement Plans, the applicant shall include the following standard note on the Improvement/Grading Plan: All on-site stationary equipment which is classified as 50 hp or greater shall either obtain a state issued portable equipment permit or a PCAPCD issued portable equipment permit.*
- 9-2(g) *During construction, the project contractors shall use low-VOC architectural coatings and asphalt, in compliance with PCAPCD Rules and Regulations, for review by the County Building Official.*

9-3 Impacts related to an increase in CO emissions at study intersections.

To evaluate the potential effect of the proposed project on local CO concentrations, the existing conditions and the existing conditions plus the proposed project were modeled at one nearby intersection using the California Department of Transportation (Caltrans) CALINE4 roadway dispersion model. For the purposes of this analysis, the discount superstore scenario, which would produce more new vehicle trips than the discount club store scenario, was assessed. The Bell Road and New Airport Road intersection was selected for the CALINE4 modeling.

The PCAPCD requires a CALINE4 CO “hotspot” computer analysis for any project that would result in the degradation of LOS at a signalized intersection to LOS E or worse. During the PM peak hour, the existing level of service (LOS) at the intersection of Bell Road and New Airport Road is LOS D. With implementation of the proposed project (under both the discount superstore and the discount club store scenarios), the LOS at this intersection during the PM peak hour would be LOS F, which is the worst LOS ranking (See Chapter 8, Transportation and Circulation, for a discussion of LOS rankings). Because the project would result in the degradation of LOS at a signalized intersection to worse than LOS E, a CALINE4 CO analysis was prepared. This intersection is expected to represent the worst-case scenario for new CO emissions associated with operation of the proposed project; other intersections that would be potentially affected by the project are not expected to experience CO concentrations that exceed the highest predicted CO concentrations at this intersection.

Maximum 1-hour and 8-hour average CO concentrations predicted at the intersection, with and without the proposed project, are presented in Table 9-9.

Table 9-9		
Maximum Predicted 1-Hour and 8-Hour Average CO Concentrations (ppm)		
Intersection	Without Project	With Project
1-Hour		
Bell Road and New Airport Road	3.3	3.6
State Standard	20.0	20.0
Federal Standard	35.0	35.0
8-Hour		
Bell Road and New Airport Road	3.3	3.6
State Standard	9.0	9.0
Federal Standard	9.0	9.0

Source: Raney Planning & Management, Inc., June 2009.

Conclusion

The CO “hotspot” analysis indicates that CO emissions at the Bell Road / New Airport Road intersection would not exceed State and federal standards; therefore, a *less-than-significant* impact would result.

Mitigation Measure(s)

None required.

9-4 Impacts related to long-term increases of criteria air pollutants.

The proposed project would result in the development of commercial land uses that would generate emissions of ROG and NO_x, which are ozone-precursor pollutants, as well as CO and PM₁₀. The predicted operational emissions for the project are summarized below in Table 9-10.

	ROG	NO_x	PM₁₀	CO
Discount Club Store	69.64 ¹	42.77	65.50	360.03
Discount Superstore	76.76 ¹	51.62	80.01	436.21
PCAPCD Significance Threshold	82.0	82.0	82.0	550.0

¹ It should be noted that the ROG emissions above include the estimated emissions that would be created by the proposed 18-pump fueling station. Pursuant to PCAPCD guidance, it was determined that the rate of emission for fueling stations with CARB Phase I and Phase II emission controls and vent valves is 1.269 pounds per thousand gallons of ROG, and for a station with an annual throughput of 9 million gallons, the resulting emissions would be approximately 31.5 pounds per day of ROG. This additional 31.5 pounds per day was added to the original estimate of project-related ROG emissions, which was 38.14 pounds per day.

Source: Raney Planning & Management, Inc., November 2009.

Pursuant to the PCAPCD's air quality significance thresholds, the project would result in a significant impact if operation of the project would result in CO concentrations that exceed 550 pounds per day. According to the URBEMIS-2007 modeling for the proposed project (See Appendix J), as shown in Table 9-10 above, operation of the project under the discount club store scenario would result in the generation of 360.03 pounds per day of CO and under the discount superstore scenario would result in the generation of 436.21 pounds per day, which would not exceed the significance threshold.

Based on the modeling conducted using URBEMIS-2007 (Version 9.2.4), operation of the proposed project would not result in total predicted emissions of ROG, NO_x, or PM₁₀ that would exceed the PCAPCD significance threshold of 82.0 pounds per day. Because predicted increases in ROG, NO_x, PM₁₀, and CO would not exceed PCAPCD significance thresholds at project buildout, the project's impact would be *less-than-significant*.

Mitigation Measure(s)

None required.

9-5 Exposure of sensitive receptors to TACs associated with the proposed fueling station.

Gasoline fueling facilities are a source of gasoline vapors that include TACs, primarily benzene. Gasoline vapors are released during the filling of both stationary underground storage tanks and the transfer from those underground storage tanks to individual vehicles. Small amounts of gasoline vapor (which is considered a ROG) escape to the atmosphere at fueling stations due to loading losses, breathing losses, refueling losses and spillage. The rate of emission for stations with CARB Phase I and Phase II emission controls and vent valves (as required by PCAPCD permit requirements) is 1.269 pounds per thousand gallons.⁷

The project site is bounded on the east and north by residential uses. The closest residence to the center of the proposed fueling station is located north of the site on the south side of Dyer Court. The distance between the center of the fueling station and the closest residence would be 800 feet (See Figure 9-1). The closest non-residential off-site structure is a building in the PG&E corporation yard directly to the southeast of the proposed fueling station. The distance between the center of the fueling station and this building would be 275 feet. The screening health risk assessment estimated exposures for employees at this building; the correction factor for employees is based on an exposure of eight hours per day, five days per week for 46 years ($8/24 \times 5/7 \times 46/70 = 0.156$).

Estimated Cancer and Non-Cancer Risk

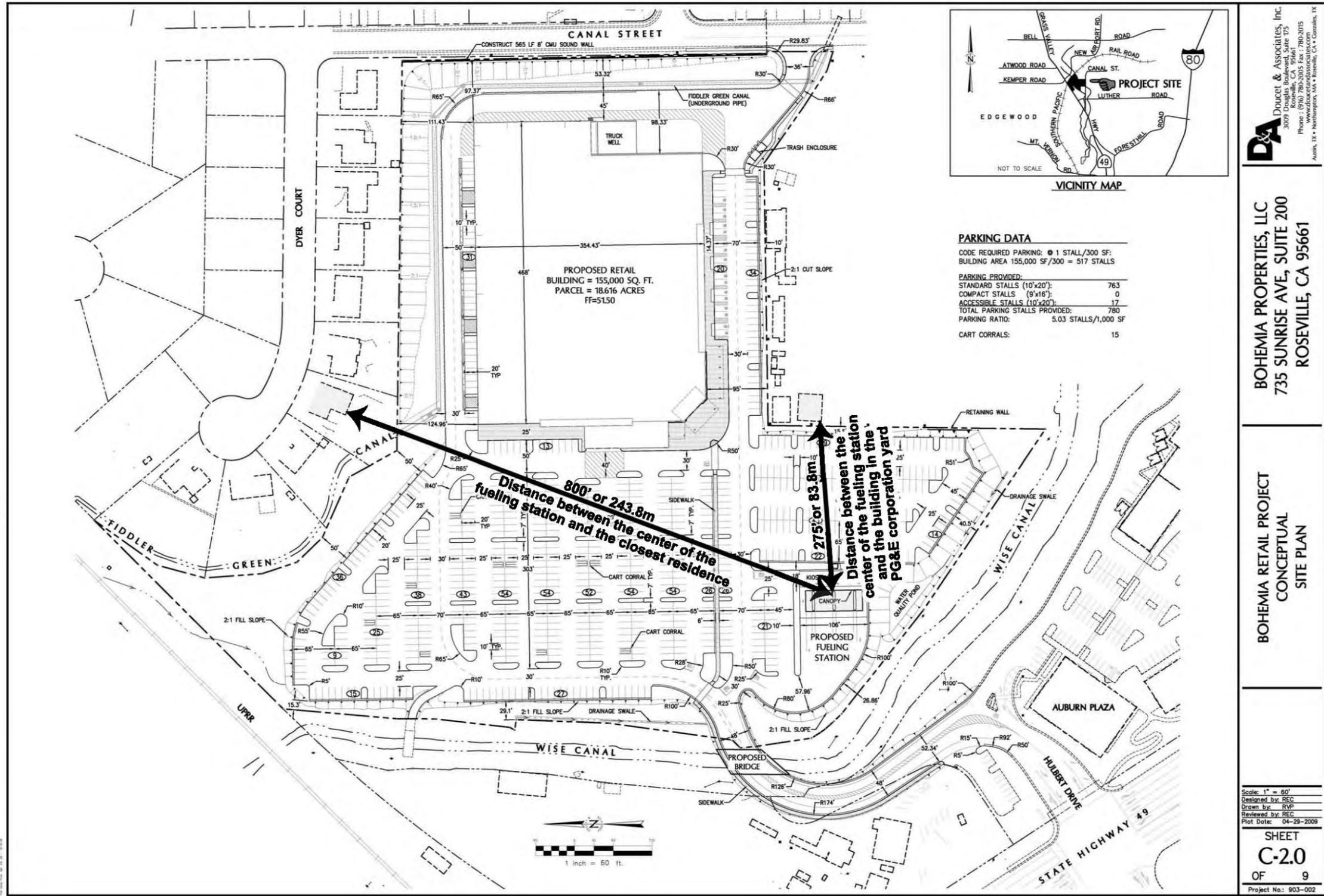
The distance to sensitive receptors was determined using the project site plan and aerial photographs. Cancer risks were found by interpolating within the attached table of cancer risks for gas stations assuming rural dispersion coefficients (See Table 9-11).

Receptor	Maximum Annual Concentration (ug/m ³)	Distance (meters)	Risk for MEI	Adjustment Factor	Adjusted Risk
Non-Residential Exposure	1.43	83.8	3.32×10^{-6}	0.156	0.52×10^{-6}
Residential Exposure	0.45	243.8	1.04×10^{-6}	1.0	1.04×10^{-6}

Source: Donald Ballanti, Certified Consulting Meteorologist. Screening Health Risk Assessment for a Gasoline Fueling Facility at the Bohemia Retail Project, Placer County, California, October 21, 2009.

Table 9-11 shows the calculation of cancer risk at the maximally exposed residential and non-residential receptors for an annual throughput of 1 million gallons of gasoline. At this emission rate, the fueling station would result in a maximum incremental individual cancer risk of 0.519 in one million (per million gallons) for non-residential uses. The project would result in a maximum incremental individual cancer risk of 1.04 in one million (per million gallons) at the point of maximum residential exposure.

Figure 9-1
Distance between Proposed Fueling Station and Closest Sensitive Receptors



The project applicant has indicated a desired maximum annual throughput of 9 million gallons. At this level of throughput, the fueling station would result in a maximum incremental individual cancer risk of 4.67 in one million for non-residential uses. The project would result in a maximum incremental individual cancer risk of 9.36 in one million at the point of maximum residential exposure. This is to be compared to the Placer County APCD's Significant Risk Threshold of 10 in one million.

The potential for non-cancer health effects is evaluated by comparing the long-term exposure level to a Reference Exposure Level (REL). A REL is a concentration level at or below which no adverse health effects are anticipated. RELs are designed to protect sensitive individuals with the population. Comparisons to RELs are made by determining the Hazard Index, which is the ratio of the estimated exposure to the REL.

Based on the anticipated 9 million gallons throughput, the maximum off-site concentration would be 12.87 ug/m³ (9 x 1.43 ug/m³). The resulting Hazard Index is 0.18. This is to be compared to the Placer County APCD's non-cancer chronic risk threshold of 1.0.

Conclusion

Based on the results in Table 9-11, TACs associated with the proposed fueling station would not exceed the Placer County Significant Risk Thresholds at the anticipated throughput of 9 million gallons per year. The Placer County APCD may place limitations on the throughput of the proposed fueling facility in order to keep risks below the Significant Risk Thresholds. Based on the above analysis, the risk thresholds would not be exceeded unless throughput was to exceed 9.61 million gallons per year. However, although TACs associated with the proposed fueling station would not exceed the Placer County Significant Risk Thresholds, the PCAPCD still requires a Health Risk Assessment (HRA) to be prepared and submitted in conjunction with the submittal of a permit application for construction and operation of the proposed fueling station. Therefore, should an HRA not be prepared for the project, impacts related to the proposed fueling station would be *potentially significant*.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above impact to a *less-than-significant* level.

- 9-5 *In conjunction with the submittal of an Authority to Construct permit to the PCAPCD for the proposed fueling station, the project applicant shall submit for review and approval by the PCAPCD a detailed Health Risk Assessment to ensure the potential risk resulting from the proposed annual throughput for the fueling station will not exceed the risk threshold of 10 in a million.*

9-6 Impacts to nearby sensitive receptors from odors associated with the project.

As discussed earlier in this report, no major stationary sources of odors have been identified within the vicinity of the project site. In addition, development of the proposed project would not result in the development of new sensitive land uses (e.g., residential dwellings). The proposed project would, however, result in the development of commercial land uses that would include a gasoline dispensing facility, which could generate odorous emissions and, if located near any sensitive receptors, could result in the frequent exposure of said receptors to objectionable odorous emissions.

However, it should be noted that the proposed fueling station would be located approximately 870 feet away from the nearest residential sensitive receptors to the north. The CARB document *Air Quality and Land Use Handbook: A Community Health Perspective*⁸ indicates that siting fueling stations (or other odor-producing facilities) within 300 feet or less of sensitive land uses should be avoided. Because the project would locate the proposed fueling station approximately 870 feet away from the nearest sensitive land use, impacts related to odorous emissions would be considered *less-than-significant*.

Mitigation Measure(s)

None required.

Endnotes

¹ Placer County. *Placer County General Plan*. August 1994.

² Placer County. *Placer County General Plan EIR*. October 1993.

³ Placer County. *Auburn/Bowman Community Plan*. 1994 (updated 1999).

⁴ Donald Ballanti, Certified Consulting Meteorologist. *Screening Health Risk Assessment for a Gasoline Fueling Facility at the Bohemia Retail Project, Placer County, California*. October 21, 2009.

⁵ España Geotechnical Consulting. *Geotechnical Investigation Report for the Proposed Bohemia Residential Development*. December 2, 2004.

⁶ California Air Pollution Control Officers Association (CAPCOA). *Gasoline Service Station Industry-wide Risk Assessment Guidelines*, December 1997.

⁷ Ibid.

⁸ California Air Resources Board, *Air Quality and Land Use Handbook: A Community Health Perspective*, April 2005.