3.3

AIR QUALITY

3.3 Air Quality

This section of the Draft EIR includes a summary of applicable regulations, existing air quality conditions, and an analysis of potential short-term and long-term air quality impacts from implementation of the proposed project. This section describes the climate and air pollution climatology of the Sacramento Valley Air Basin (SVAB), United States Environmental Protection Agency (US EPA) criteria pollutants, and the air basin's attainment status for each, as well as current regional air quality.

Emissions from project implementation are analyzed and mitigation measures are presented. This analysis relies on an URBEMIS Model run (see Appendix B) and the traffic analysis described in Section 3.12 and Appendix O of this document. During the Notice of Preparation (NOP) period comments were received regarding potential impacts from soot, exhausts, and fumes, particularly on Pacheco School students and staff, and the cumulative air quality impacts of the project.

3.3.1 SETTING

Environmental Setting

The project site is located in the northern portion of the Sacramento Valley Air Basin (see Figure 3.3-1). The Sacramento Valley Air Basin includes the following counties: Butte, Colusa, Glenn, Placer, Sacramento, Shasta, Solano, Sutter, Tehama, Yolo, and Yuba. The basin is surrounded by the Klamath and Coastal Mountains to the northwest and the Cascade Mountains to the northeast and east. This geography, coupled with the relatively calm winds and fairly stable atmospheric conditions, creates a high potential for significant air pollution in the Basin.

Generally, the County experiences moderate to very poor capability to disperse pollutants nearly 80 percent of the time. This is, in large measure, due to the relatively stable atmosphere which acts to suppress vertical air movement. Extremely stable atmospheric conditions referred to as "inversions" act as barriers to pollutant dissipation. In valley locations under 1,000 feet elevation, such as the Redding Metropolitan area, these conditions create a "lid" under which pollutants are trapped. Dust and other pollutants can be trapped within these inversion layers and will not disperse until atmospheric conditions become more unstable. This situation creates concentrations of pollutants at or near the ground surface which may pose significant health risks for plants, animals, and people.

CRITERIA POLLUTANTS

The US EPA uses six criteria pollutants as indicators of air quality and has established for each of them a maximum concentration above which adverse effects on human health may occur. Table 3.3-1 summarizes the general characteristics, health effects, and major sources of each criteria pollutant.

Table 3.3-1
US EPA Criteria Pollutants

Pollutant		Characteristics	Health Effects	Major Sources
Ozone (O_3)		A highly reactive photochemical pollutant created by the action of sunshine on ozone precursors (primarily reactive hydrocarbons and oxides of nitrogen). Often called photochemical smog.	Eye irritation. Respiratory function impairment.	Combustion sources such as factories and automobiles as well as evaporation of solvents and fuels.
Carbon Monoxide (CO)		An odorless, colorless gas that is highly toxic. It is formed by the incomplete combustion of fuels.	Impairment of oxygen transport in the bloodstream. Aggravation of cardiovascular disease. Fatigue, headache, confusion, dizziness. Can be fatal in the case of very high concentrations.	Automobile exhaust, combustion of fuels, combustion of wood in woodstoves and fireplaces.
Nitrogen Dioxide (NO_2)		Reddish-brown gas that discolors the air, formed during combustion.	Increased risk of acute and chronic respiratory disease.	Automobile and diesel truck exhaust, industrial processes, and fossil-fueled power plants.
Sulfur Dioxide (SO_2)		A colorless gas with a pungent, irritating odor.	Aggravation of chronic obstruction lung disease. Increased risk of acute and chronic respiratory disease.	Diesel vehicle exhaust, oil-powered power plants, and industrial processes.
Particulate Matter (PM)	Suspended Particulate Matter (PM_{10})	Solid and liquid particles of dust, soot, aerosols, and other matter that are less than 10 microns in diameter.	Aggravation of chronic disease and heart/lung disease symptoms.	Combustion, automobiles, field burning, factories, and unpaved roads. Also a result of photochemical processes.

Pollutant		Characteristics	Health Effects	Major Sources
	Fine Particulate Matter ($PM_{2.5}$)	Solid and liquid particles of dust, soot, aerosols, and other matter that are less than 2.5 microns in diameter.	Aggravation of chronic disease and heart/lung disease symptoms.	Fuel combustion, atmospheric chemical reaction.
Lead (Pb)		A metal that occurs both naturally in the environment and in manufactured products.	Organ damage Reproductive disorders Osteoporosis	Industrial processes

Source: California Air Resources Board, 2007

Ozone (O_3)

Ozone (O_3) is a photochemical oxidant and the major component of smog. While O_3 in the upper atmosphere is beneficial to life by shielding the earth from harmful ultraviolet radiation from the sun, high concentrations of O_3 at ground level are a major health and environmental concern. O_3 is not emitted directly into the air but is formed through complex chemical reactions between precursor emissions of volatile organic compounds (VOC) and oxides of nitrogen (NOx) in the presence of sunlight. These reactions are stimulated by sunlight and temperature so that peak O_3 levels occur typically during the warmer times of the year. Both VOCs and NOx are emitted by transportation and industrial sources. VOCs are emitted from sources as diverse as autos, chemical manufacturing, dry cleaners, paint shops, and other sources using solvents.

The reactivity of O_3 causes health problems because it damages lung tissue, reduces lung function, and sensitizes the lungs to other irritants. Scientific evidence indicates that ambient levels of O_3 affect not only people with impaired respiratory systems, such as asthmatics, but also healthy adults and children. Exposure to O_3 for several hours at relatively low concentrations has been found to significantly reduce lung function and induce respiratory inflammation in normal, healthy people during exercise. This decrease in lung function generally is accompanied by symptoms that include chest pain, coughing, sneezing, and pulmonary congestion.

Major ozone precursors include mobile sources such as cars; light-duty and heavy-duty trucks; and stationary emission sources such as industrial facilities, home furnaces, wood-burning appliances, and waste disposal and treatment facilities.

Carbon Monoxide (CO)

Carbon monoxide (CO) is a colorless, odorless, and poisonous gas produced by incomplete burning of carbon in fuels. When CO enters the bloodstream, it reduces the delivery of oxygen to the body's organs and tissues. Health threats are most serious for those who suffer from

cardiovascular disease, particularly those with angina or peripheral vascular disease. Exposure to elevated CO levels can cause impairment of visual perception, manual dexterity, learning ability, and performance of complex tasks. The primary source of carbon monoxide is automobile use.

Nitrogen Dioxide (NO_2)

Nitrogen dioxide (NO_2) is a brownish, highly reactive gas that is present in all urban atmospheres. NO_2 can irritate the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections. Nitrogen oxides are an important precursor both to ozone (O_3) and acid rain and may affect both terrestrial and aquatic ecosystems.

The major mechanism for the formation of NO_2 in the atmosphere is the oxidation of the primary air pollutant nitric oxide (NO). NOx plays a major role, together with VOCs, in the atmospheric reactions that produce O_3. NOx forms when fuel is burned at high temperatures. The two major emission sources are transportation and stationary fuel combustion sources such as electric utility and industrial boilers.

Sulfur Dioxide (SO_2)

Sulfur dioxide (SO_2) affects breathing and may aggravate existing respiratory and cardiovascular disease in high doses. Sensitive populations include asthmatics, individuals with bronchitis or emphysema, children, and the elderly. SO_2 is also a primary contributor to acid deposition, or acid rain, which causes acidification of lakes and streams and can damage trees, crops, historic buildings, and statues. In addition, sulfur compounds in the air contribute to visibility impairment in large parts of the country. This is especially noticeable in national parks. Ambient SO_2 results largely from stationary sources such as coal and oil combustion, steel mills, refineries, pulp and paper mills, and nonferrous smelters.

Particulate Matter (PM_{10} and $PM_{2.5}$)

Particulate matter includes dust, dirt, soot, smoke, and liquid droplets directly emitted into the air by sources such as factories, power plants, cars, construction activity, fires, and natural windblown dust. Particles formed in the atmosphere by condensation or the transformation of emitted gases such as SO_2 and VOCs are also considered particulate matter.

Based on studies of human populations exposed to high concentrations of particles (sometimes in the presence of SO_2) and laboratory studies of animals and humans, there are major effects of concern for human health. These include effects on breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular disease, alterations in the body's defense systems against foreign materials, damage to lung tissue, carcinogenesis, and premature death. The major subgroups of the population that appear to be most sensitive to the effects of particulate matter include individuals with chronic obstructive pulmonary or cardiovascular disease or influenza, asthmatics, the elderly, and children. Particulate matter also soils and damages materials and is a major cause of visibility impairment.

Lead (Pb)

Lead (Pb) exposure can occur through multiple pathways, including inhalation of air and ingestion of Pb in food, water, soil, or dust. Excessive Pb exposure can cause seizures, mental retardation, and/or behavioral disorders. Low doses of Pb can lead to central nervous system damage. Recent studies have also shown that Pb may be a factor in high blood pressure and in subsequent heart disease.

Toxic Air Contaminants

In addition to the criteria pollutants discussed above, toxic air contaminants (TACs) are another group of pollutants of concern. Unlike criteria pollutants, no safe levels of exposure to TACs can be established. There are many different types of TACs, with varying degrees of toxicity. Source 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. Public exposure to TACs can result from emissions from normal operations as well as accidental releases of hazardous materials during upset conditions. The health effects of TACs include cancer, birth defects, neurological damage, and death.

Diesel exhaust is a TAC of growing concern in California. The California Air Resources Board (CARB) in 1998 identified diesel engine particulate matter as a TAC. The exhaust from diesel engines contains hundreds of different gaseous and particulate components, many of which are toxic. Many of these compounds adhere to the particles, and because diesel particles are so small, they penetrate deep into the lungs. Diesel engine particulate has been identified as a human carcinogen. Mobile sources, such as trucks, buses, automobiles, trains, ships and farm equipment, are by far the largest source of diesel emissions.

ATTAINMENT STATUS

The District is required by the California Health and Safety Code to endeavor to achieve and maintain the state ambient air quality standards at the earliest practicable date and has developed an Attainment Plan with specific emission control strategies in order to achieve this goal. The Plan is a coordinated effort with participation from air districts in the Northern Sacramento Valley Air Basin. The Plan must be re-evaluated once every three years and must contain features such as best available control technology thresholds, use of reasonable available control technology for existing emission sources, transportation control measures, area-wide and indirect source control programs, emission inventory analysis, and public education.

Federal and state air quality laws require identification of areas not meeting the ambient air quality standards. These areas must develop regional air quality plans to eventually attain the standards. Under both the federal and state Clean Air Acts, Shasta County is a nonattainment area (standards have not been attained) for ozone and particulate matter (PM_{10}). The air basin is either attainment or unclassified for other ambient standards. Table 3.3-2 summarizes the County's attainment status for each standard.

Table 3.3-2
Shasta County Designations

Pollutant	Designation/Classification	
	Federal Standards	State Standards
Ozone -- One hour	No Federal Standard (See note below)	Nonattainment
Ozone -- Eight hour	Nonattainment	Nonattainment
PM_{-10} (Particulate matter 10 micrometers in diameter)	Unclassified	Nonattainment
$PM_{-2.5}$ (Particulate matter 2.5 micrometers in diameter)	Unclassified/Attainment	Nonattainment
CO	Unclassified/Attainment	Attainment
Nitrogen Dioxide	Unclassified/Attainment	Attainment
Sulfur Dioxide	Unclassified	Attainment
Lead (Particulate)	No Federal Standard	Attainment
Hydrogen Sulfide	No Federal Standard	Unclassified
Sulfates	No Federal Standard	Attainment
Visibility Reducing Particles	No Federal Standard	Unclassified
Note: The Federal One-Hour Ozone National Ambient Air Quality Standard was revoked on June 15, 2005.		

Source: California Air Resources Board, 2007 and U.S. EPA, 2009

AMBIENT AIR QUALITY

The California Air Resources Board (CARB) and the United States Environmental Protection Agency (EPA) currently focus on the following air pollutants as indicators of ambient air quality: Ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM), and lead. Because these are the most prevalent air pollutants known to be deleterious to human health and extensive health-effects criteria documents are available, they are commonly referred to as "criteria air pollutants."

The EPA has established primary and secondary National Ambient Air Quality Standard (NAAQS) for the following criteria air pollutants: O_3, CO, NO_2, SO_2, PM_{10}, fine particulate matter ($PM_{2.5}$), and lead. The primary standards protect the public health and the secondary standards protect the public welfare. In addition to the NAAQS, CARB has established California Ambient Air Quality Standard (CAAQS) for the following criteria air pollutants: sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particulate matter. In most cases the CAAQS are more stringent than the NAAQS. The NAAQS and CAAQS as discussed further in the regulatory section below.

The Shasta County Air Quality Management District (SCAQMD) currently operates monitoring stations in Redding and Anderson. At these sites, inhalable PM_{10} samplers are operated every sixth day, year-round. The highest concentrations of PM_{10} typically occur during the forest fire season, which generally starts in August and lasts until the fall rains begin.

Continuous sampling of ground-level ozone is conducted year round. When an exceedance of the state standard for ozone is predicted, the SCAQMD issues media announcements which urge the community to reduce or alter driving habits to lessen the predicted impact of this photochemically produced pollutant.

Gaseous pollutant monitors are located in Shasta County at Anderson-North Street, Lassen Volcanic National Park-Manzanita Lake, Redding-Breslauer Lane, and Shasta Lake-Lake Boulevard (Figure 3.3-2). The closest sites to the project are the Anderson-North Street and Redding-Health Dept Roof. A summary of available air quality data for 1991-2008 from these monitoring sites are shown in Table 3.3-3. Table 3.3-3 shows that the federal/state standards for ozone are occasionally exceeded in the project area. PM_{10} standards have only been exceeded at the State level. The last time the $PM_{2.5}$ standards were exceeded was during the 2001 season.

Table 3.3-3
Ambient Air Quality in Anderson

Year	Anderson-North Street					Redding-Health Dept Roof				
	State Ozone	Federal Ozone	State PM_{10} [1]	Federal PM_{10} [1]	Federal $PM_{2.5}$ [2]	State Ozone	Federal Ozone	State PM_{10} [1]	Federal PM_{10} [1]	Federal $PM_{2.5}$ [2]
2008	1	0	*	*	*	0	0	*	*	*
2007	0	0	0	0	*	0	0	0	0	0
2006	0	0	6.1	0	*	2	0	6.1	0	0
2005	2	0	0	0	*	3	0	0	0	0
2004	3	0	0	0	*	2	1	5.8	0	0
2003	9	0	11.5	0	*	0	0	0	0	0
2002	0	0	*	0	*	4	0	5.8	0	*
2001	0	0	6	0	*	0	0	*	0	6
2000	2	0	5.7	0	*	3	0	5.7	0	*
1999	13	0	*	*	*	21	0	*	0	38.3
1998	4	0	18.3	0	*	40	3	*	0	*
1997	3	0	*	0	*	8	0	*	0	*
1996	2	0	6.1	0	*	16	0	*	*	*
1995	0	0	13.1	0	*	1	0	*	0	*
1994	0	0	*	*	*	7	0	12.2	0	*
1993	1	0	*	*	*	1	0	6.6	0	*
1992	*	*	*	*	*	10	0	*	*	*
1991	*	*	*	*	*	12	0	50.3	0	*

(1) Measurements of PM_{10} are made every sixth day. Data is the estimated number of days that the standard would have been exceeded had measurements been collected every day.
(2) National 2006 24-Hour $PM_{2.5}$ Standard
*There was insufficient (or no) data available to determine the value.

Source: Air Resources Board Aerometric Data Analysis and Management System (ADAM)

SENSITIVE RECEPTORS

"Sensitive Receptors" are defined as facilities where sensitive population groups (children, the elderly, the acutely ill, and the chronically ill) are likely to be located. These land uses include residences, schools, playgrounds, child care centers, retirement homes, convalescent homes, hospitals, and medical clinics.

The project itself would be a new sensitive receptor. Other nearby sensitive receptors are existing homes to the north, east of the site, as well as the Pacheco Elementary School located immediately southeast of the site.

Regulatory Setting

FEDERAL

Federal Clean Air Act

The Federal Clean Air Act (FCAA) was first signed into law in 1970. In 1977, and again in 1990, the law was substantially amended. The FCAA is the foundation for a national air pollution control effort, and it is composed of the following basic elements: national ambient air quality standards for criteria air pollutants, hazardous air pollutant standards, state attainment plans, motor vehicle emissions standards, stationary source emissions standards and permits, acid rain control measures, stratospheric ozone protection, and enforcement provisions.

The US Environmental Protection Agency (EPA) is responsible for administering the FCAA. The FCAA requires the EPA to set National Ambient Air Quality Standards (NAAQS) for several problem air pollutants based on human health and welfare criteria. Two types of NAAQS were established: primary standards, which protect public health, and secondary standards, which protect the public welfare from non-health-related adverse effects such as visibility reduction.

The FCAA recognizes the importance for each state to locally carry out the Clean Air Act, as special consideration of local industries; geography, housing patterns, etc. are needed to have full comprehension of the local pollution control problems. As a result, the EPA requires each state to develop a State Implementation Plan (SIP) that explains how each state will implement the FCAA within their jurisdiction. A State Implementation Plan (SIP) is a collection of rules and regulations that a particular state will implement to control air quality within their jurisdiction. The CARB is the state agency that is responsible for preparing the California SIP.

National Emissions Standards for Hazardous Air Pollutants (NESHAP) (40 CFR Part 61, Subpart M)

The NESHAPs are emissions standards set by the US EPA for an air pollutant not covered by National Ambient Air Quality Standards that may cause an increase in fatalities or in serious, irreversible, or incapacitating illness. The standards for a particular source category require the maximum degree of emission reduction that the EPA determines to be achievable, which is known as the Maximum Achievable Control Technology (MACT).

STATE

California Clean Air Act

The California Clean Air Act (CCAA) was first signed into law in 1988. The CCAA provides a comprehensive framework for air quality planning and regulation, and spells out in statute the state's air quality goals, planning and regulatory strategies, and performance. The CARB is the agency responsible for administering the CCAA. CARB established ambient air quality standards pursuant to the California Health and Safety Code (CH&SC) [§39606(b)], which are similar to the federal standards.

Ambient Air Quality Standards

National ambient air quality standards are determined by the Environmental Protection Agency. The standards include both primary and secondary ambient air quality standards. Primary standards are established with a safety margin. Secondary standards are more stringent than primary standards and are intended to protect public health and welfare. States have the ability to set standards that are more stringent than the federal standards. As such, California established more stringent ambient air quality standards.

Federal and state ambient air quality standards have been established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, suspended particulates (PM_{10}) and lead. In addition, California has created standards for pollutants that are not covered by federal standards including sulfates and hydrogen sulfide. The federal and state primary standards for major pollutants are shown in Table 3.3-4 below.

Table 3.3-4
Federal and State Air Quality Standards

Pollutant	Average Time	California Standards[a] Concentration[c]	Federal Standards[b] Primary[c, d]
Ozone (O_3)	1 hour	0.09 ppm (180µg/m^3)	—
	8 hours	0.07 ppm (137 mg/m^3)	0.08 ppm (157 µg/m^3
Respirable Particulate Matter (PM_{10})	24 hours	50 µg/m^3	150 µg/m^3
	Annual arithmetic mean	20 µg/m^3	50 µg/m^3
Fine Particulate Matter ($PM_{2.5}$)	24 hours	35 µg/m^3	35 µg/m^3
	Annual arithmetic mean	12 µg/m^3	15 µg/m^3
Carbon Monoxide (CO)	8 hours	9.0 ppm (10 µg/m^3)	9 ppm (10 mg/m^3)
	1 hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)
Nitrogen Dioxide (NO_2)*	Annual arithmetic mean	0.030 pp, (57µg/m^3)	0.053 ppm (100 µg/m^3)
	1 hour	0.18 ppm (339 µg/m^3)	—
Sulfur Dioxide (SO_2)	Annual arithmetic mean	—	0.030 ppm (80 µg/m^3)
	24 hours	0.04 ppm (105 µg/m^3)	0.14 ppm (365 µg/m^3)
	1 hour	0.25 ppm (655 µg/m^3)	—
Lead (Pb)[e]	30-day average	1.5 µg/m^3	—
	Calendar quarter	—	1.5 µg/m^3
Visibility Reducing Particles	8 hours	[f]	—
Sulfates	24 hours	25 µg/m^3	—
Hydrogen Sulfide	1 hour	0.03 ppm (42 µg/m^3)	—
Vinyl Chloride[e]	24 hours	0.010 ppm (26 µg/m^3)	—

ppm = Parts Per Million
µg/m^3 = micrograms per cubic meter
mg/m^3 = milligrams per cubic meter
* The Nitrogen Dioxide ambient air quality standard was amended on February 22, 2007, to lower the 1-hr standard to 0.18 ppm and establish a new annual standard of 0.030 ppm. These changes become effective after regulatory changes are submitted and approved by the Office of Administrative Law, expected later this year.
[a] California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter – PM_{10}, $PM_{2.5}$, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

Pollutant	Average Time	California Standards[a] Concentration[c]	Federal Standards[b] Primary[c, d]

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

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

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

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

[f] Extinction coefficient of 0.23 per kilometer — visibility of ten miles or more (0.07 — 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.

Source: California Air Resources Board, November 17th, 2008

State Implementation Plan

The State Implementation Plan (SIP) is the blueprint for meeting federal air quality standards by the applicable deadlines set in the Federal Clean Air Act. California's SIP is a compilation of region-specific plans that detail how each area will meet the air quality standards. The plan includes an estimate of the emission reductions needed to meet each air quality standard based on air monitoring results, data on emission sources, and complex air quality modeling. It reflects the benefits of the pollution control program adopted by air agencies at all levels, and may also include commitments to implement new strategies. Together, these elements must reduce emissions by an amount sufficient to meet the air quality standard in each region. Once the local element of the plan is adopted by the air district(s) and other responsible local agencies, it is sent to the CARB for adoption and then formally submitted to the Environmental Protection Agency for approval as a revision to the California SIP.

LOCAL

Shasta County Air Quality Management District, Rule 2:1 - New Source Review

The purpose of this Rule is to establish pre-construction review requirements for new and modified stationary sources of air pollution for use of Best Available Control Technology (BACT), analysis of air quality impacts, and to ensure that the operation of such sources does not interfere with the attainment or maintenance of ambient air quality standards. This regulation shall provide for no net increase in emissions, pursuant to Section 40918 of the *Health and*

Safety Code, from new or modified stationary sources that emit, or have the potential to emit, 25 tons per year or more of any non-attainment pollutant or its precursors.

This Rule shall apply to all new and modified stationary sources that are subject to District permit requirements, and after construction, emit or may emit any affected pollutants. The requirements of this regulation in effect at the time any application for an Authority to construct is deemed complete shall apply. This Rule became effective on August 31, 1993.

Rule 2:1 – New Source Review, can be seen in Appendix C.

Shasta County General Plan

Shasta County has adopted an Air Quality Element as a part of its General Plan. The Element contains a number of objectives and policies related to preservation and improvement of air quality related to the proposed project:

Policy AQ-1e: The County shall require new air pollution point sources such as, but not limited to, industrial, manufacturing and processing facilities to be located an adequate distance from residential areas and other sensitive receptors.

Policy AQ-2b: The County will work to accurately determine and fairly mitigate the local and regional air quality impacts of projects proposed in the unincorporated portions of Shasta County.

Policy AQ-2c: Land use decisions, where feasible, should contribute to the improvement of air quality. New projects shall be required to reduce their respective air quality impacts to below levels of significance, or proceed as indicated in Policy AQ-2e.

Policy AQ-2d: Shasta County shall ensure that air quality impacts identified during CEQA review are: (1) consistently and fairly mitigated, and (2) mitigation measures are feasible.

Policy AQ-2e: Shasta County will cooperate with the AQMD in assuring that new projects with stationary sources of emissions of non-attainment pollutants or their precursors that exceed 25 tons per year shall provide appropriate emission offsets. A comparable program which offsets indirect emissions of these pollutants exceeding 25 tons per year from development projects shall also be utilized to mitigate air pollution impacts. An Environmental Impact Report will be required for all projects that have unmitigated emissions of non-attainment pollutants exceeding 25 tons per year.

Policy AQ-2f: Shasta County shall require appropriate Standard Mitigation Measures and Best Available Mitigation Measures on all discretionary land use applications as recommended by the AQMD in order to mitigate both direct and indirect emissions of non-attainment pollutants.

Policy AQ-2g: Significance thresholds as proposed by the AQMD for emissions shall be utilized when appropriate for: (1) Reactive Organic Gases (ROG) and Oxides of Nitrogen (NOx), both of which are precursors of ozone, and (2) inhalable particulate matter (PM10) in determining mitigation of air quality impacts.

Policy AQ-2j: The County shall work toward measures to reduce particulate emissions from construction, grading, excavation and demolition to the maximum extent feasible.

Policy AQ-4b: The County's development standards shall require the paving of roads as a part of new development permits to the extent necessary to meet access and air quality objectives. These requirements shall be designed to help mitigate potentially significant adverse air quality impacts created by particulate emissions on both an individual and cumulative basis.

Policy AQ-5b: The SCDRM will consult with the AQMD, where appropriate, when conducting CEQA reviews for all discretionary development applications.

Policy AQ-6a: The County shall encourage project sites designed to increase the convenience, safety and comfort of people using transit, walking or cycling.

Policy AQ-6b: The County shall review all subdivision street and lot designs, commercial site plans and multi-family site plans to identify design changes that can improve access by transit, bicycle or walking.

Policy AQ-8a: The County will encourage new development projects to reduce air quality impacts from area sources and energy consumption requirements for heating and cooling.

Policy AQ-8b: The County will encourage use of energy conservation features and low-emission equipment for all new residential and commercial development.

Policy E-g: Revision or development of landscaping and tree protection standards should provide consideration to improving building energy efficiency and shading of streets and parking areas during the hot summer season.

Policy C-9b: Project proponents shall be required to implement effective measures included in the County's lists of Standard Mitigation Measures (SMMs) and Best Available Mitigation Measures (BAMMs) to reduce vehicle use and associated emissions related to existing and future land use development as part of the environmental review process.

In addition to objectives and policies, the element describes a strategy utilizing URBEMIS computer modeling to evaluate air quality impacts. Included in this approach are assessments of the following:

- Potential air quality emissions exceeding Level "A" or Level "B" thresholds as established by the Shasta County AQMD

- The effectiveness of proposed emission offsets

- Potential emissions of toxic or hazardous air pollutants

- Emission thresholds and mitigation measures

The County uses a uniform method for applying mitigation measures addressing air quality impacts. These mitigation measures are described as Standard Mitigation Measures (SMM) and Best Available Mitigation Measures (BAMM). The County's adopted SMM and BAMM are reprinted in Appendix C of this EIR.

Table 3.3-5 provides a discussion of the proposed project's consistency with applicable portions of *Shasta County General Plan* Policies related to air quality.

Table 3.3-5
General Plan Consistency – Air Quality

Policy No.	Finding	Discussion
AQ-1e	Consistent	Point source emissions will pose no hazard or nuisance to residential areas with inclusion of Mitigation Measures #3.3-1 and #3.3-2.
AQ-2b	Consistent	Mitigation measures have been proposed for the proposed project that are both fair and feasible.
AQ-2c	Consistent	Consistent with Policy AQ-2e, an Environmental Impact Report has been prepared for this project.
AQ-2d	Consistent	Mitigation measures have been proposed for the proposed project that are both fair and feasible.
AQ-2e	Consistent	An Environmental Impact Report has been prepared for this project consistent with this policy.
AQ-2f	Consistent	Mitigation Measures #3.3-1 and #3.3-2 specify the required Standard Mitigation Measures and Best Available Mitigation Measures.
AQ-2g	Consistent	The required information is included in the analysis of impacts described below.
AQ-2j	Consistent	Particulate emissions reduction is addressed below in Mitigation Measure #3.3-1.
AQ-4b	Consistent	The proposed project will have access via roads that have already been paved or are being improved for the proposed project.
AQ-5b	Consistent	The AQMD was consulted and has provided significant input to the Environmental Impact Report.
AQ-6a	Consistent	The proposed project is a commercial development intended to serve patron of the stores in the development. To the extent feasible and necessary, the facility has been designed to be accessible to pedestrians and those using alternative modes of transportation.
AQ-6b	Consistent	The proposed project has been reviewed by the county to determine compliance with this policy.

Policy No.	Finding	Discussion
AQ-8a	Consistent	Mitigation Measure # 3.3-1a, 3.3-1b and 3.3-1c have all been included to reduce air quality impacts from area sources and energy consumption requirements for heating and cooling.
AQ-8b	Consistent	Mitigation Measure # 3.3-1a, 3.3-1b and 3.3-1c have all been included the use of energy conservation features and low-emission equipment for new commercial development.
E-g	Consistent	Mitigation Measure # 3.3-1a and 3.3-1b have been included to provide improved building energy efficiency and shading of streets and parking areas during the hot summer season.
C-9b	Consistent	Mitigation Measure # 3.3-1a and 3.3-2b have been included to provide the implement of effective measures included in the County's lists of Standard Mitigation Measures (SMMs) and Best Available Mitigation Measures (BAMMs) to reduce vehicle use and associated emissions related to existing and future land use development as part of the environmental review process.

3.3.2 THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the proposed project is considered to have a significant impact on the environment if it will:

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

Thresholds Used for Air Quality Analysis

The SCAQMD has adopted air quality significance threshold criteria for determining the significance of potential air quality impacts and applicable mitigation measures as presented in Table 3.3-6. Two types of thresholds have been established by the SCAQMD, Level "A" and Level "B", with "A" being the lower level. Projects whose emissions do not exceed Level "A" thresholds are only required to implement a set of Standard Mitigation Measures (SMMs) developed by SCAQMD that are designed to reduce the total emissions generated by the project.

Table 3.3-6
Shasta County Air Quality Emission Thresholds

Type of Emission	Level "A" Thresholds (pounds per day)	Level "B" Thresholds (pounds per day)
Oxides of Nitrogen (NOx)	25	137
Reactive Organic Gases (ROG)	25	137
Particulate Matter (PM_{10})	80	137

Source: Shasta County AQMD

The sequence for applying SMM and BAMM is outlined below:

1. Apply SMM to all projects based on potential air quality impacts. This effort will help contribute to reducing cumulative impacts.

2. Apply SMM and appropriate BAMM when a project exceeds Level "A" thresholds. The BAMM will be applied to any project which exceeds Level "A" thresholds. The appropriate type and number of BAMM applied to a project will be based on the unique characteristics of the project. BAMM will be selected from a list of measures kept updated by the Shasta County Planning Department (SCPD) and the SCAQMD.

3. Apply SMM, BAMM, and special BAMM (when project exceeds Level "B" thresholds) based on their emission reduction potential to lower project emissions below Level "B" thresholds. The SCAQMD will advise the SCPD of the efficiency of proposed emission measures as part of the effort to reduce project emissions below Level "B" thresholds.

4. If application of the above procedures results in reducing project emissions below Level "B" thresholds, the project can proceed with an environmental determination of a Mitigated Negative Declaration assuming other project impacts do not require more extensive environmental review.

5. If project emissions cannot be reduced to below Level "B" thresholds, emission offsets will be required. The SCPD may seek the assistance of the SCAQMD regarding other efforts and measures that could be used to reduce unmitigated emissions exceeding the 137 lbs. per day. If, after applying the emissions offsets, the project emissions still exceed the Level "B" threshold, an EIR will be required before the project can be considered for action by the reviewing authority. Unmitigated emission increases above 137 pounds per day for either ozone precursors or PM10 are considered to represent a significant adverse impact.

Another significance threshold is the exceedance of the state or federal standards for carbon monoxide, normally determined by a "hotspot" analysis. Carbon monoxide is not a problem pollutant in Shasta County, so such a "hotspot" analysis is not required as part of the environmental review process, unless requested by the Shasta County AQMD.

3.3.3 IMPACTS AND MITIGATION MEASURES

Impact 3.3-1: Conflict with or obstruct implementation of any applicable air quality plan

Discussion/Conclusion: The Air Pollution Control Districts and Air Quality Management Districts (Districts) for the counties located in the northern portion of the Sacramento Valley Air Basin (These include the Counties of Shasta, Tehama, Glenn, Butte, Colusa, Yuba and Sutter) together comprise the Northern Sacramento Valley Planning Area (NSVPA). The NSVPA Districts prepared and adopted a uniform air quality attainment plan for the purpose of achieving and maintaining healthful air quality throughout the Northern Sacramento Valley Air Basin. The 2006 Air Quality Attainment Plan addresses the progress made in implementing the 2003 Plan and proposes modifications to the strategies necessary to attain the California ambient air quality standard for the 1-hour ozone standard at the earliest practicable date. The Plan identifies the air pollution problems which are to be cooperatively addressed on as many fronts as possible in order to make the region a healthier place to live now and in the future. Like previous plans, the 2006 Plan focuses on the adoption and implementation of control measures for stationary sources, area wide sources, and indirect sources, and addresses public education and information programs. The proposed project will comply with the district's rules and regulations and, as applicable, will obtain all required District permits. This impact is ***less than significant***.

Mitigation Measures

No mitigation measures are required.

Impact #3.3-2: Cause a violation of any air quality standard or contribute substantially to an existing or projected air quality violation due to area source or operational emissions

Discussion/Conclusion: A regional air quality impact assessment was conducted using the URBEMIS-2007 for Windows (version 9.2.4). The model assumes build-out of the proposed project to include 425,496 sq. ft. Shopping Center, 130,501 sq. ft. Home Improvement Store, 158,700 sq. ft. Discount Club, 18,863 sq. ft. High-Turnover Restaurant, 3,500 sq. ft. Drive In Bank and 3,600 sq. ft. for a Fast Food Restaurant as broken out in Section 3.12, Transportation and Traffic, of the Draft EIR (see Appendix B for detailed results of the URBEMIS model run). Additionally, in the traffic study it was determined that approximately twenty four percent of the trips were internalized, therefore, 24 percent trip reduction was done in the URBEMIS model run. Table 3.3-7 presents area source and operational emissions associated with project implementation. URBEMIS-2007 modeling results indicate that the proposed project will generate approximately 185.96 pounds per day (lbs/day) of ROG, 190.84 lbs/day of NO_x, and 192.82 lbs/day PM_{10} of area source and operational emissions. Table 3.3-7 also presents Shasta County air quality emission thresholds for reactive organic gases, oxides of nitrogen, and particulate matter (Levels "A" and "B") as compared to estimated project emissions for this project.

Table 3.3-7
Estimated Unmitigated Area Source and Operational Emissions

	Emissions In Pounds Per Day		
	Reactive Organic Gases (ROG)	NO_x	PM_{10}
Retail Center	185.96	190.84	192.82
Level "A" Thresholds	25	25	80
Level "B" Thresholds	137	137	137

Source: Quad Knopf, Shasta County AQMD

Thresholds of significance of the SCAQMD consider emissions of ROG, NO_x or PM_{10} to be significant if they exceed 137 pounds per day, requiring application of SMM and BAMM. Based on this criterion, the project will have a significant impact due to the generation of ROG, NO_x and PM_{10} if mitigation measures are not incorporated into the proposed project. This impact is ***significant.***

Mitigation Measures

Implementation of the following mitigation measures will substantially reduce area source and operational emissions resulting from the proposed project, but not to a level that definitively guarantees that emissions will be below the SCAQMD Level "B" thresholds; therefore, this impact is considered ***significant and unavoidable.***

Mitigation Measure # 3.3-2a:

For the control of operational emissions, the project applicant shall implement all appropriate and feasible Shasta County AQMD Level "A" SMMs and Level "B" BAMMs for the control of ozone precursors. The following Shasta County AQMD operational SMMs are deemed feasible for the size, location, and character of the proposed project:

- *The project shall provide for the use of energy-efficient lighting (includes controls) and process systems, such as water heaters, furnaces, and boiler units.*
- *The project shall utilize a central water heating system featuring the use of low-NO_x hot water heaters.*
- *The project shall utilize energy-efficient and automated controls for air conditioning.*

Table 3.3-8 contains BAMM deemed feasible for a facility of the size, location and character of the proposed project:

Table 3.3-8
Mitigation Measures for Controlling Indirect Source Emissions

Best Available Mitigation Measures (BAMM)	***Emission Reduction Efficiency***		
	ROG	***NO_X***	***PM_{10}***
The project shall improve the thermal efficiency of commercial and industrial structures as appropriate by: (1) reducing thermal load with	*1.0 - 2.0%* ***1.5%***	*1.0 - 3.0%* ***2.0%***	*1.0 - 5.5%* ***3.25%***

Best Available Mitigation Measures (BAMM)	Emission Reduction Efficiency		
	ROG	NO_X	PM_{10}
automated and timed temperature controls, or (2) occupancy load limits.			
The project shall incorporate shade trees, adequate in number and proportional to the project size, throughout the project site to reduce building heating and cooling requirements.	*1.0 - 2.0%* ***1.5%***	*1.0 - 3.0%* ***2.0%***	*1.0 - 5.5%* ***3.25%***
The project shall include the installation of solar water heaters for at least 25 percent of the building floor area.	*1.0 - 7.5%* ***4.25%***	*1.0 - 7.5%* ***4.25%***	*1.0 - 7.5%* ***4.25%***
The project shall orient buildings and main entrances to streets with bus services.	*0.2 - 1.2%* ***0.7%***	*0.2 - 1.2%* ***0.7%***	*0.2 - 1.2%* ***0.7%***
The project shall provide for and/or include on-site services such as cafeterias, food vending machines, automatic tellers, etc., as appropriate.	*0.2 - 3.4%* ***1.8%***	*0.3 - 4.5%* ***2.4%***	*0.3 - 4.5%* ***2.4%***
The project shall provide on-site pedestrian facility improvements such as walking paths and building access which are physically separated from street and parking lot traffic.	*0.2 - 1.2%* ***0.7%***	*0.2 - 1.6%* ***0.95%***	*0.2 - 1.6%* ***0.95%***
The project shall provide for shower facilities for pedestrian employee's use. The project shall provide shower/locker facilities, where appropriate, for bicycling and pedestrian commuters	*0.2 - 2.4%* ***1.3%***	*0.3 - 3.2%* ***1.75%***	*0.3 - 3.2%* ***1.75%***
The project shall provide for synchronized traffic signals, as deemed necessary by local transportation planning agencies, along streets impacted by project development.	*4.0 - 8.0%* ***4.0%***	*4.0 - 8.0%* ***4.0%***	*4.0 - 8.0%* ***4.0%***
The project shall contribute to traffic-flow improvements that are deemed not to be substantially growth-inducing.	*4.0 - 8.0%* ***6.0%***	*4.0 - 8.0%* ***6.0%***	*4.0 - 8.0%* ***6.0%***
The project shall design interior major streets to serve the main entrances to buildings.	*0.1 - 3.0%* ***1.55%***	*0.1 - 3.0%* ***1.55%***	*0.1 - 3.0%* ***1.55%***
TOTAL EMISSIONS REDUCTION FROM BAMM	*11.9-38.7%* ***23.30%***	*12.1-43.0%* ***25.60%***	*12.1-48.0%* ***28.10%***

Source: Shasta County Air Quality Management District

Mitigation Measure # 3.3-2b:

Implementation of the following mitigation measures will substantially reduce air quality impacts related to human activity within the proposed project area:

- *Trees shall be selected to shade paved areas that will shade 30% of the area within 15 years. Structural soil should be used under paved areas to improve tree growth.*

- *If transit service is available to the project site, improvements shall be made to encourage its use. If transit service is not currently available, but is planned for the area in the future, easements shall be reserved to provide for future improvements such as bus turnouts, loading areas, route signs and shade structures. In the event transit services are not planned for the area in the future, efforts to extend or expand service to the project are shall be coordinated with local transit operators.*

- *Projects shall include as many clean alternative energy features as possible to promote energy self-sufficiency. Examples include (but are not limited to): photovoltaic cells, solar thermal electricity systems, small wind turbines, etc. Rebate and incentive programs are offered for alternative energy equipment.*

- *Two 110/208 volt power outlets shall be installed for every two loading docks in commercial areas.*

- *Passive solar building design and landscaping conducive to passive solar energy use shall be promoted;*

- *Energy efficient widows (double pane and/or Low-E)shall be installed as feasible;*

- *High-albedo (reflecting) roofing materials shall be used as feasible;*

- *Awnings or other shading mechanism for windows shall be installed when practicable;*

- *Porch, patio and walkway overhangs shall be constructed where practicable ;*

- *Daylighting (natural lighting) systems such as skylights, light shelves, interior transom windows etc. shall be installed when practicable;*

- *Electrical outlets around the exterior of the buildings shall be installed to encourage use of electric landscape maintenance equipment to promote the use of low or non-polluting landscape maintenance equipment (e.g. electric lawn mowers, reel mowers, leaf vacuums, electric trimmers and edgers, etc.); and*

- *Structures shall be pre-wire with high speed modem connections/DSL and extra phone lines.*

Mitigation Measure # 3.3-2c:

The applicant shall comply with the State of California Title 24, Building Energy Efficiency Standards, to help reduce California's energy consumptions. These standards are periodically updated, with the most recent update, the 2008 Standards, becoming effective January 1st, 2010.

Impact #3.3-3: Cause a violation of any air quality standard or contribute substantially to an existing or projected air quality violation due to onsite construction emissions.

Discussion/Conclusion: Although the impacts from construction related air pollutant emissions are temporary in duration, such emissions can become a significant air quality impact. Construction activities such as grading, excavation, building construction, and paving can generate substantial amounts of air pollution. Emissions from construction equipment engines also contribute to elevated concentrations of PM_{10} and CO, as well as ROGs and NO_x.

Several pieces of diesel-powered heavy equipment will operate during the construction of the proposed project. Site preparation activity emissions have been estimated based on the URBEMIS-2007. Exhaust and fugitive dust emissions will be generated by construction activities in the proposed project area, such as excavation and grading, construction vehicle traffic, wind blowing over exposed earth, construction workers traveling to and from the construction sites, heavy-duty construction equipment operation, and application of architectural coatings.

Dust from construction activities can cause impacts both locally and regionally. The dry climate of the area during the summer months, combined with the soils or the area, create a high potential for dust generation. Increased dustfall and locally elevated PM_{10} levels near the construction activity are expected. Depending on the weather, soil conditions, the amount of activity taking place at any one time, and the nature of dust control efforts, these impacts could significantly affect existing land uses near the proposed project area. A quantitative approach as well as qualitative approach will be applied for analysis of the construction emissions.

Construction emissions estimates for the proposed project were calculated using the URBEMIS 2007 computer program, version 9.2.4 and incorporated into this EIR as Appendix B. Based on the output of the URBEMIS program, the project will produce the emissions shown in Table 3.3-9. Table 3.3-10 below includes a mitigated URBEMIS Model run for construction emissions. Based on the proposed project size it was estimated that construction of the entire project could occur in as few as four years. However, in consideration of market conditions and off site improvement requirements the project may take longer than four years to reach buildout. The analysis presented in this ADEIR, based on a four year project buildout assumption, should be considered as a worst case scenario for construction emissions. If the project were to be phased over a period of time greater than four years, construction related emissions would be spread over a longer period of time which would reduce the magnitude of impact reflected in the four year buildout assumption analysis.

Table 3.3-9
Construction Equipment Exhaust Emissions – Unmitigated (lbs/day)

Year	Emissions In Pounds Per Day (Unmitigated)			
	ROG	NOx	CO	PM_{10}
Year 2010	15.14	**79.08**	133.05	**175.03**
Year 2011	6.92	**26.19**	94.45	1.76
Year 2012	**246.95**	24.62	92.40	1.66
Year 2013	**246.40**	22.76	85.89	1.53

Year	Emissions In Pounds Per Day (Unmitigated)			
	ROG	NOx	CO	PM_{10}
Level "A" Thresholds	25	25	NA	80
Level "B" Thresholds	137	137	NA	137
Notes: ROG = Reactive Organic Gases, NOx = Nitrogen Oxides, CO = Carbon Monoxide, PM_{10} = Particulate Matter, 10 Microns Items that have been **Bolded** are recognized to exceed the Level "A" Threshold. Further review of the URBEMIS Model run include in Appendix B includes a detailed report for construction emissions.				

The following construction fleet calculations were collected through URBEMIS 9.2.4.

The construction fleet for the proposed project is estimated by URBEMIS to consist of the following equipment:

Demolition:

3 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day
2 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

Fine Grading:

1 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day
1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day
1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day
3 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day
1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Paving:

1 Pavers (100 hp) operating at a 0.62 load factor for 8 hours per day
2 Paving Equipment (104 hp) operating at a 0.53 load factor for 6 hours per day
2 Rollers (95 hp) operating at a 0.56 load factor for 6 hours per day

Building Construction:

1 Cranes (399 hp) operating at a 0.43 load factor for 7 hours per day
3 Forklifts (145 hp) operating at a 0.3 load factor for 8 hours per day
1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day
3 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day
1 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Air pollutant emissions from construction activities associated with the proposed project will impact local air quality and the unmitigated calculated emissions exceed SCAQMD thresholds. This impact is considered ***significant.***

Mitigation Measures

Implementation of the following mitigation measures are required to reduce emissions from construction activities to be under the SCAQMD threshold (see Table 3.3-10 below) Implementation of these measures will result in a ***less than significant*** impact as reflected in Table 3.3-10.

Table 3.3-10
Construction Equipment Exhaust Emissions - Mitigated (lbs/day)

Year	Emissions In Pounds Per Day (Mitigated)			
	ROG	NOx	CO	PM_{10}
Year 2010 (Mitigated)	15.14	74.37	133.05	45.68
Year 2011 (Mitigated)	6.92	23.84	94.45	1.20
Year 2012 (Mitigated)	43.40	22.40	92.40	1.14
Year 2013 (Mitigated)	79.72	22.76	85.89	1.07
Level "A" Thresholds	25	25	NA	80
Level "B" Thresholds	137	137	NA	137
Notes: ROG = Reactive Organic Gases, NOx = Nitrogen Oxides, CO = Carbon Monoxide, PM_{10} = Particulate Matter, 10 Microns				

Further review of the URBEMIS Model run include in Appendix B includes a detailed report for construction emissions.

Mitigation Measure #3.3-3a:

To reduce emissions and thus reduce cumulative impacts, the following measures shall be implemented:

- *The idling time of all construction equipment used at the site shall not exceed five minutes.*
- *The hours of operation of heavy-duty equipment shall be minimized.*
- *All equipment shall be properly tuned and maintained in accord with manufacturer's specification.*
- *When feasible, electric carts or other smaller equipment shall be used at the project site.*

URBEMIS Mitigation Measures to reduce calculated emissions below SCAQMD thresholds:

- *The applicant shall be responsible for applying non-toxic soil stabilizers (according to manufacturer's specifications) to all inactive construction areas (previously graded areas which remain inactive for 96 hours), in accordance with the Shasta County Grading Ordinance.*

- *All areas (including unpaved roads) with vehicle traffic shall be watered two times per day or have dust palliatives applied for stabilization of dust emissions.*

- *Aqueous diesel fuel for all diesel equipment shall be used.*

- *Low-volatile organic compound paints capable of reducing ROG emissions by 15% compared to existing architectural coating rules shall be used.*

Mitigation Measure #3.3-3b:

During construction the following measures shall be implemented to control fugitive dust and emissions of particulates in compliance with SCAQMD SMMs:

- *Alternatives to open burning of vegetative material on the project site shall be used by the project applicant unless otherwise deemed infeasible by the SCAQMD. Among suitable alternatives are chipping, mulching, or conversion to biomass fuel.*

- *All material excavated, stockpiled, or graded shall be sufficiently watered to prevent fugitive dust from leaving property boundaries and causing a public nuisance or a violation of an ambient air standard. Watering shall occur at least twice daily with complete site coverage, preferably in the mid-morning and after work is completed each day.*

- *All on-site vehicles shall be limited to a speed of 15 miles per hour on unpaved roads.*

- *All land clearing, grading, earth moving or excavation activities on the project shall be suspended when winds are expected to exceed 20 miles per hour.*

- *All inactive portions of the development site shall be seeded and watered until a suitable grass cover is established.*

- *All trucks hauling dirt, sand, soil or other loose material shall be covered or shall maintain at least two feet of freeboard (i.e., minimum vertical distance between top of load and trailer) in accordance with the requirements of CVC Section 23114. This provision shall be enforced by local law enforcement agencies.*

- *All material transported offsite shall be either sufficiently watered or securely covered to prevent a public nuisance.*

- *During initial grading, earth moving, or site preparation, the project shall be required to construct a paved (or dust palliative treated) apron, at least 100 feet in length, onto the project site from the adjacent paved road(s).*

- *Paved streets adjacent to the development site shall be swept or washed at the end of each day to remove excessive accumulations of silt and/or mud which may have accumulated as a result of activities on the development site.*

- *Prior to final occupancy, the applicant shall reestablish ground cover on the construction site through seeding and watering in accordance with the Shasta County Grading Ordinance.*

Impact #3.3-4: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard

Discussion/Conclusion: The project site is located at the northern portion of the Sacramento Valley Air Basin (SVAB), and is under the jurisdiction of the SCAQMD. Both the State of California and the federal government have established ambient air quality standards for pollutants. Shasta County is in attainment for the federal standards for particulate matter less than 2.5 micrometers in diameter ($PM_{2.5}$), carbon monoxide (CO), and nitrogen dioxide (NO_2). In addition, the California Air Resources Board (CARB) shows Shasta County is in attainment with State standards for CO, nitrogen dioxide (NO_2), sulfur dioxide, sulfates and Lead. CARB lists Shasta County having an "unclassified" designation for hydrogen sulfides (H_2S) and visibility reducing particulates. The Federal Standard lists Shasta County having an "unclassified" designation for particulate matter 10 micrometers in diameter (PM_{10}) and sulfur dioxide.

Construction and operation of the proposed project will result in temporary emissions of ozone precursors (reactive organic gases [ROG] and nitrogen oxides [NOx], which form ozone under certain conditions) and PM_{10}. The SCAQMD's approach to mitigating construction related impacts is to implement the District's SMM and BAMM , which requires reasonable precaution to control ROG, NO_x or PM_{10} during construction and operational activities. The impact is considered ***potentially significant***.

Mitigation Measures

Implementation of the Mitigation Measures 3.3-3a and 3.3-3b will reduce construction emission below the SCAQMD thresholds and Mitigation Measures 3.3-2a, 3.3-2b and 3.3-2c will reduce potential area source and operational emissions, but not below the SCAQMD thresholds. Without the reduction of potential area source and operational emissions below the SCAQMD threshold this impact is ***significant and unavoidable.***

Impact #3.3-5: Expose sensitive receptors to substantial pollutant concentrations.

Discussion/Conclusion: Sensitive receptors in the vicinity of the project site include the existing elementary school and adjacent residential houses. Development of the proposed project could include a variety of retail commercial uses, including gasoline fueling facilities, and there is some uncertainty about what pollutants will be introduced to the area. However, it is possible that any one these uses could introduced increased pollutants to the project area.

The proposed project would result in two new sources of toxic air contaminants, one mobile and one stationary. Mobile sources of toxic air contaminants are not subject to the regulations of the

SCAQMD, while stationary sources are subject to SCAQMD regulations and must obtain a permit from the District.

MOBILE SOURCE PARTICULATE MATTER FROM DIESEL FUELED ENGINES

In 1998, the California Air Resources Board (CARB) identified particulate matter from diesel-fueled engines as a toxic air contaminant (TAC). CARB has completed a risk management process that identified potential cancer risks for a range of activities using diesel-fueled engines. The greatest diesel particulate risks from new development are generally associated with stationary diesel engines and locations where diesel engines are allowed to idle for extended periods of time. Where air districts have developed guidelines for diesel risk assessments for CEQA documents, the identified situations requiring analysis are locations with extended truck idling (truck stops, warehouse/distribution centers, transit centers), and train idling.

The potential impacts to sensitive receptors from the idling of diesel delivery trucks for the proposed project would be less than significant because the majority of the delivery trucks would be subject to State of California – Title 13, Section 2485, Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling.

The purpose of the airborne toxic control measure is to reduce public exposure to diesel particulate matter and other air contaminants by limiting the idling of diesel-fueled commercial motor vehicles. This regulation applies to diesel-fueled commercial motor vehicles that operate in the State of California with gross vehicular weight ratings of greater than 10,000 pounds that are, or must be, licensed for operation on highways. The regulation applies to vehicles based inside and outside of the State of California. Effective February 1, 2005, all applicable diesel powered vehicle operators must not idle the vehicle's primary diesel engine for greater than five minutes at any location. The regulations do include exceptions, however typical diesel powered trucks used for delivery of goods to retail locations would not be exempted from the regulations.

The potential for sensitive receptors to be impacted by substantial pollutant concentrations is ***less than significant*** due to compliance with State of California – Title 13, Section 2485- Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling.

STATIONARY SOURCE TOXIC AIR CONTAMINANTS FROM GASOLINE FUELING STATIONS

The proposed project may include one, or more, gasoline fueling stations. The exact location of the facilities is unknown, but possible locations are at the northwest corner of Knighton and Churn Creek Roads and near the wastewater treatment facility close to the proposed project sites northerly boundary. Gasoline stations are a source of gasoline vapors that would include Toxic Air Contaminants (TACs) such as benzene. Gasoline vapors are released during the filling of both the stationary underground storage tanks and the transfer from those underground tanks to individual vehicles. Small amounts of gasoline vapor (a reactive organic gas) escape to the atmosphere at filling stations due to loading loss, breathing loss, refueling loss and spillage. The rate of allowable emission, for stations with CARB Phase I and Phase II emission controls and

vent valves (as required by SCAQMD permit requirements) is 1.269 pounds per thousand gallons.[1]

The SCAQMD has stringent requirements for the control of gasoline vapor emissions from gasoline dispensing facilities that require all new facilities to install and maintain CARB Certified Vapor Recovery Systems. Primary applicable SCAQMD regulations are Rule 3:3, "Gasoline Loading, Transfer and Dispensing" and Rule 2:1, New Source Review". As a source of TACs, a gasoline fuelling station is subject to the SCAQMD's toxic risk screening and risk management procedures.

In order to assess potential health risk associated with the operation of gasoline fueling facilities within the proposed project site, a screening risk assessment was conducted by Donald Ballanti, Certified Consulting Meteorologist in September 2009 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*[2] (included as Appendix R to this Draft EIR). Using the project site plan and aerial photographs of the project environs, the distance between the centers of the two proposed gasoline facility sites and the nearest sensitive receptors were 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. The only inputs required for the CAPCOA risk calculation is 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. Since 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.

The project site is near Pacheco Elementary School, which is located just east of the Knighton Road/Churn Creek Road intersection on the south side of Churn Creek Road. Exposures at this school have been estimated for employees and students. The correction factor for school employees is based on being on the site 8 hours per day, 180 days per year for 46 years. The correction factor for students is based on being on the site 8 hours per day, 180 days per year for 5 years.

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

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

Maximum residential exposure was also estimated for both analyzed sites. The closest residence to the southern gas station site is located on the east side of Churn Creek Road south of Knighton Road. The closest residence to the northern gas station is to the northwest where the boundary of the site forms a corner.

The distance to receptors was determined using the site plan and aerial photographs. Cancer risks were found by interpolating within a table of cancer risks for gas stations as calculated using the ISCST-3 model with the default SCREEN-3 meteorological data. The table of cancer risk versus distance is included in Appendix 2 of Appendix R.

Table 3.3-11 shows the calculation of cancer risk at the maximally exposed school and residential receptors for an annual throughput of 1 million gallons of gasoline.

Table 3.3-11
Calculated Excess Carcinogenic Risk for 1 Million Gallon Annual Throughout

Receptor	Maximum Annual Concentration (ug/m^3)	Distance (Meters)	Risk for MEI	Adjustment Factor	Adjusted Risk
Southern Site					
Student Exposure	0.822	148	1.90×10^{-6}	0.012	0.023×10^{-6}
Teacher Exposure	0.822	148	1.90×10^{-6}	0.108	0.205×10^{-6}
Resident Exposure	0.34	300	0.79×10^{-6}	1.0	0.79×10^{-6}
Northern Site					
Student Exposure	0.10	700	0.23×10^{-6}	0.012	0.002×10^{-6}
Teacher Exposure	0.10	700	0.23×10^{-6}	0.108	0.02×10^{-6}
Resident Exposure	1.56	76	3.62×10^{-6}	1.0	3.62×10^{-6}

At this emission rate, locating the gasoline station at the analyzed southern site will result in an incremental individual cancer risk of 0.023 per million for a student at Pacheco Elementary School, and a cancer risk of 0.205 per million for a teacher. The southern analyzed site will result in an incremental individual cancer risk of 0.79 per million at the point of maximum residential exposure. These risks are to be compared to the SCAQMD's significant risk threshold of 10 in one million established in the *Policy Establishing Guidelines for Toxics Health Risk Assessment*.

Locating a gasoline station at the northern analyzed site will result in an incremental individual cancer risk of 0.002 per million for a student at Pacheco Elementary School, and a cancer risk of 0.02 per million for a teacher. The northern analyzed gas station site would result in an incremental individual cancer risk of 3.62 per million at the point of maximum residential exposure. These risks are to be compared to the SCAQMD's significant risk threshold of 10 in one million established in the *Policy Establishing Guidelines for Toxics Health Risk Assessment.*

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 within the population. The REL for benzene is 71 ug/m^3.

For the southern analyzed gasoline station site, the resulting Hazard Index is 0.0115 for the maximally exposed student and teacher, and 0.005 for the maximally exposed resident. These values are to be compared to the SCAQMD's significant risk threshold of 1.0 established in the *Policy Establishing Guidelines for Toxics Health Risk Assessment*.

For the northern analyzed gasoline station site, the resulting Hazard Index is 0.0015 for the maximally exposed student and teacher, and 0.022 for the maximally exposed resident. These values are to be compared to the SCAQMD's significant risk threshold of 1.0 established in the *Policy Establishing Guidelines for Toxics Health Risk Assessment*.

PROJECT INCREMENTAL RISK

The actual risk resulting from the proposed gasoline facilities will be directly proportional to the actual throughput, which is not known at this time. Throughput could be limited by SCAQMD permit requirements and the results of the health risk assessment that the District would perform as part of the permitting process.

Based on the results in Table 3.3-11 a fueling facility at the southern analyzed site would not exceed the significant risk thresholds unless the annual throughput exceeded 12.65 million gallons. A similar calculation for the northern analyzed site yields a maximum throughput of 2.65 million gallons before the significant risk thresholds are reached.

If a throughput of more than 12.65 million gallons is requested at the southern analyzed site, the allowable throughput can be increased by moving the gasoline station site further to the north and west towards the center of the site. Alternatively, it is very likely that a more sophisticated method of calculating risks, using actual meteorology and an air dispersion model, would provide a less conservative, more realistic estimate of risk, which would provide for a higher level of annual throughput.

If a throughput of more than 2.76 million gallons is requested at the northern analyzed site, the allowable throughput can be increased by moving the gasoline station site further to the south and east towards the center of the site. Alternatively, it is very likely that a more sophisticated method of calculating risks, using actual meteorology and an air dispersion model, would provide a less conservative, more realistic estimate of risk, which would provide for a higher level of annual throughput.

The cancer risk due to benzene emissions from gasoline fueling stations within the proposed project site are well within the significant risk thresholds established by the SCAQMD indicating that a gasoline station at any location within the proposed project site could obtain a permit from the SCAQMD (under current rules and regulations) and that a gasoline fueling facility located within the proposed project site and diesel truck exhausts emissions would have a ***less than significant*** impact on health risks at the closest sensitive receptors.

Mitigation Measures

No mitigation measures are required.

Impact #3.3-6: Exposure of a substantial number of people to sources of objectionable odors

Discussion/Conclusion: With exception of the on-site wastewater treatment plant, the proposed project consists of retail commercial businesses that will not generate significant odorous emissions that could expose a substantial number of people to objectionable odors.

Because offensive odors rarely cause any physical harm and no requirements for their control are included in state or federal air quality regulations, the SCAQMD has no rules or standards related to odor emissions, other than its nuisance rule. Any actions related to odors are based on citizen complaints to local governments and the SCAQMD.

The project applicant has proposed the use of a Membrane Bioreactor (MBR) treatment plant to be located on the north side of the proposed project site in proximity to housing. The MBR treatment plant is a robust wastewater treatment facility with features designed to reduce maintenance and provide reliable and efficient wastewater treatment and reclamation for small scale applications. Unlike older less efficient odor producing wastewater treatment plants, the MBR systems have minimal impact on the environment, minimize odor, due to covered headworks and treatment basins, and produce treated water that meets stringent discharge requirements.

Although the proposed MBR treatment plant is within the windshed of several nearby residences, the technology employed in the design and operation of the proposed on-site MBR treatment plant will result in minimal odor release into the atmosphere as there will be no odor generating exposed treatment process.

Additionally, the proposed wastewater treatment system will be subject to review and permit approval by the Regional Water Quality Control Board (RWQCB). Should the RWQCB find it necessary to require odor scrubbers, the applicant will be required to install them at the facility. The use of the closed MBR treatment plant and compliance with any necessary RWQCB requirements pertaining to the reduction of odor will result in a ***less than significant*** impact.

Mitigation Measure

No mitigation measures are required.