Sierra Vista Specific Plan
Air Quality/Greenhouse Gas Technical Report

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Table of Contents

List of Tables and Figures

Acronyms Used in this Report

AADT – average annual daily trips
AB – (California) Assembly Bill
AG – (California) Attorney General
ARB – (California) Air Resources Board
CAAQS – California Ambient Air Quality Standards
CAL-EPA – California Environmental Protection Agency
CAPCOA – California Air Pollution Control Officers Association
CAT – Climate Action Team
CEC – California Energy Commission
CEQA – California Environmental Quality Act
CO – carbon monoxide
CO_2 – carbon dioxide
CO_2e – carbon dioxide equivalent
CH_4 - methane
EPA – Environmental Protection Agency
GHG – greenhouse gas
GWP – global warming potential
IPCC – Intergovernmental Panel on Climate Change
LCFS – Low Carbon Fuels Standard
LED – light emitting diode
LEED – Leadership in Energy and Environmental Design
LOS – level of service
NAAQS – National Ambient Air Quality Standards
OPR – (California) Office of Planning and Research
N_2O – nitrous oxide
NOx – oxides of nitrogen
NO_2 – nitrogen dioxide
PCAPCD – Placer County Air Pollution Control District
PM10 – particulate matter 10 microns or less in diameter
PM2.5 – particulate matter 2.5 microns or less in diameter
ppm – parts per million
ROG – reactive organic gas
SB – (California) Senate Bill
SOx – sulfur oxides
SO_2 – sulfur dioxide
SRI – solar reflective index
SVAB – Sacramento Valley Air Basin
SVSP – Sierra Vista Specific Plan
TAC – toxic air contaminant

Executive Summary

This report analyzes the air quality and greenhouse gas effects of the Sierra Vista Specific Plan (SVSP). The SVSP project site is 2,064.1 acres of undeveloped land located in unincorporated Placer County, immediately west and south of the City of Roseville's existing City limits (see Figure 1).

The proposed SVSP would include development of 6,655 residential units, 214 acres of commercial and office uses, 70 acres of public/quasi-public, 256 acres of open space uses, and 90 acres of parks (see Figure 2). This scenario is assumed to be built out by 2025.

A second scenario includes the buildout of the Richland properties (currently part of the proposed Urban Reserve Area) and assumes that 9,995 dwelling units will be completed by 2035. The second scenario is referred to as the 2035 cumulative buildout.

This report also analyzes four project alternatives to the 2025 SVSP buildout:

- Alternative 1 - the increased avoidance, increased density alternative, assumes 6,663 dwelling units and 599 acres of open space.
- Alternative 2 - the increased avoidance, same density alternative, assumes 4,929 residential units and 599 acres of open space.
- Alternative 3 - the project footprint, reduced density alternative, assumes the same open space as the proposed SVSP, with 4,986 residential units.
- Alternative 4 - the no project alternative.

Criteria pollutant emissions of reactive organic gases, nitrogen oxides, and particulate matter were estimated for the SVSP and compared to the Placer County Air Pollution Control District's (PCAPCD's) significance thresholds. Construction and operation of the SVSP would exceed the PCAPCD's thresholds for each pollutant. Mitigation measures were identified to reduce construction emissions. Even with mitigation, however, construction emissions would still exceed the PCAPCD thresholds. No mitigation measures were identified to reduce operational emissions. Consequently, operational emissions would exceed the PCAPCD thresholds.

Carbon monoxide (CO) modeling was conducted to determine whether the project would cause or contribute to violations of either the California or national ambient air quality standards. Neither the proposed SVSP nor

any of the project alternatives would cause violations of the ambient standards.

This report qualitatively evaluates the SVSP's health risks associated with potential exposure to TACs. This analysis focuses on proximity of proposed sensitive land uses to land uses that could generate TACs, such as roads and industrial development. Mitigation measures are included to reduce the impacts of potential health risks associated with TACs.

This report also evaluates the SVSP's potential for land use conflicts from odors. The analysis focuses on the proximity of sensitive land uses to land uses that could generate odors, such as commercial and industrial development. Mitigation measures are included to reduce potential odor impacts at sensitive receptors.

Finally, the report estimates greenhouse gas emissions (GHG) associated with the proposed SVSP and for the cumulative 2035 scenario. Several mitigation measures were identified that could reduce the amount of GHGs produced by the SVSP.

Project Description

The proposed Sierra Vista Specific Plan (SVSP) project site is approximately 2,064.1 acres located in unincorporated Placer County, immediately west and south of the City of Roseville's existing City limits (see Figure 1). The project site is located approximately 6 miles west of Interstate 80 and State Route 65, 10 miles northeast of the City of Sacramento, 10 miles east of State Route 99, 5 miles west of downtown Roseville, and 4 miles east of the Sutter County line. The proposed project site is west of Fiddyment Road and north of Baseline Road and extends west from Fiddyment Road to approximately ½ mile west of the intersection of Watt Avenue and Baseline Road.

The SVSP is a proposed specific plan project that would include development of a mix of land uses, including 9,995 residential units, approximately 214 acres of commercial and office uses, approximately 70 acres of public/quasi-public, 256 acres of open space uses, and 90 acres of parks (see Figure 2). The majority of the proposed project site is within the City's Sphere of Influence (SOI), which was expanded in 2004, as part of the West Roseville Specific Plan annexation.

This air quality analysis evaluates two buildout scenarios. The first scenario considers the buildout of 6,655 dwelling units by 2025. The second scenario includes the buildout of the Richland properties (currently part of the proposed Urban Reserve Area) and assumes that 9,995 dwelling units will be completed by 2035. The first scenario is referred to as the 2025 buildout. The second scenario is referred to as the 2035 cumulative buildout.

There are 4 project alternatives being considered to the 2025 buildout scenario. Alternative 1, the increased avoidance, increased density alternative, assumes slightly greater residential units with greater open space. This alternative would accommodate approximately 6,663 dwelling units and 599 acres of open space. Alternative 2, the increased avoidance, same density alternative, assumes 1,726 fewer residential units with greater open space. This alternative would accommodate approximately 4,929 residential units and 599 acres of open space. Alternative, the project footprint, reduced density alternative, assumes the same open space avoidance as the proposed project, with lower housing densities, for a total of 4,986 units. Alternative 4 is the no project alternative, which would encompass both "no development" and "no action" because it is anticipated that no development would occur if the current land use

designations and zoning are retained. Alternative 4 would have no emissions associated with it since the project area would not be developed.

This technical report describes existing air quality conditions, summarizes the air quality regulatory environment, and analyzes potential short-term and long-term air quality impacts of the proposed project.

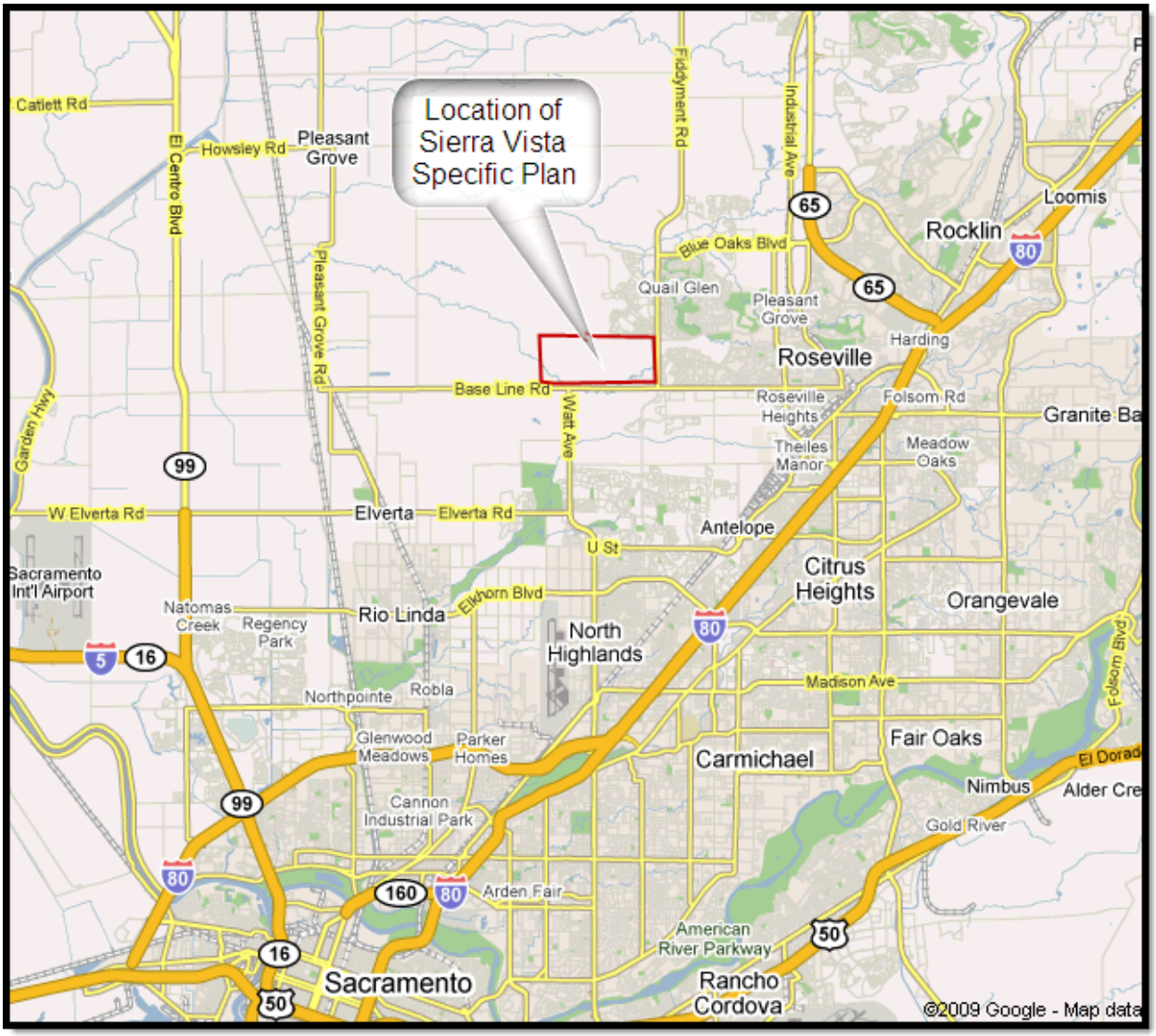

Figure 1. Regional Project Location

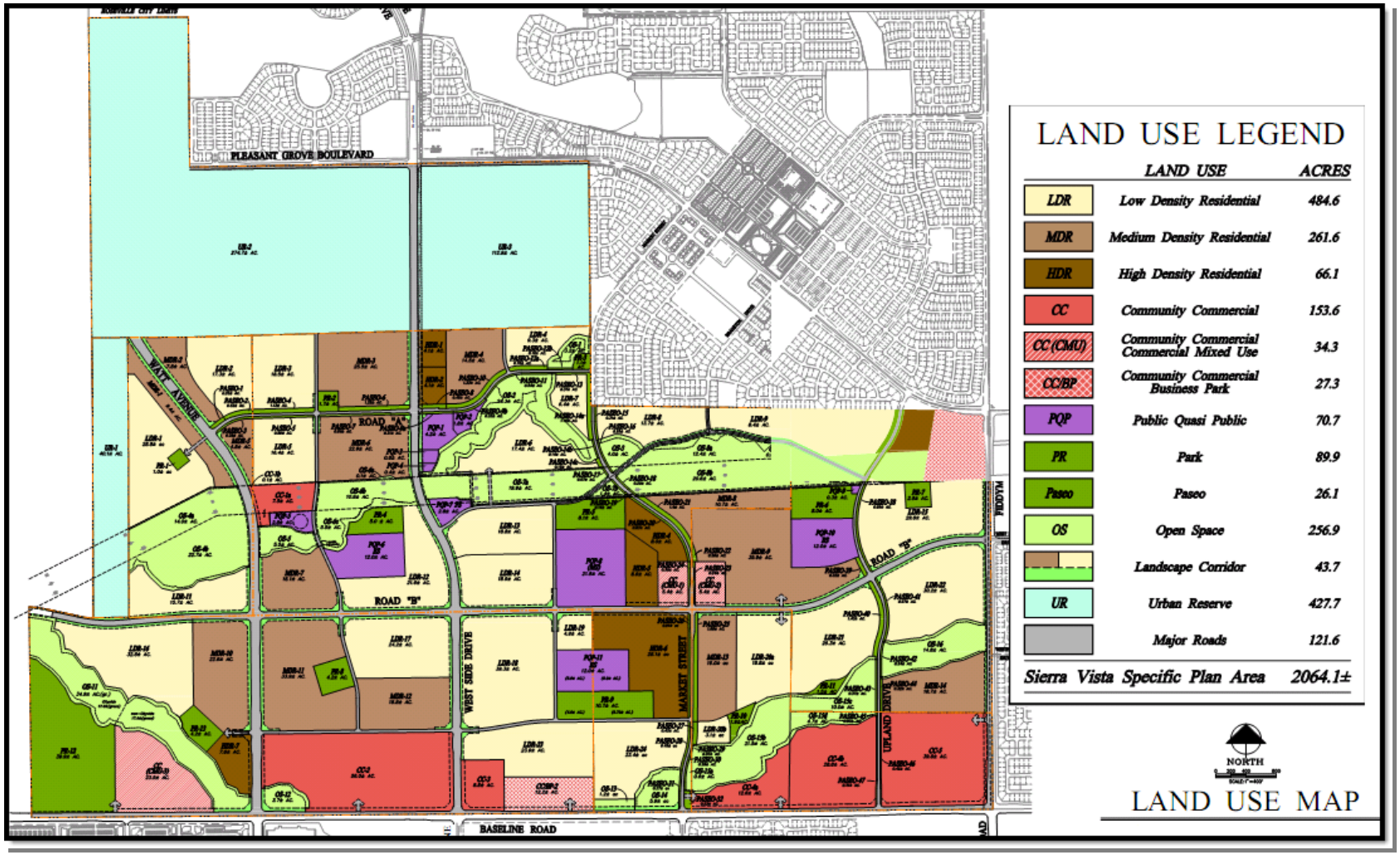

Figure 2. Sierra Vista Specific Plan Land Use Map

Environmental Setting

Existing Air Quality Conditions

Climate and Topography

The City of Roseville is located in southern Placer County within the Sacramento Valley Air Basin (SVAB). The SVAB contains the southern portion of Placer County and ten other counties including Shasta, Tehama, Colusa, Yolo, East Solano, Butte, Yuba, Sutter, Glenn and Sacramento County.

The SVAB is surrounded by the Coast Range to the west, the Cascade Range to the north, and Sierra Nevada mountains to the east. The winters are wet and cool and the summers are hot and dry.

Air pollution can be transported into the basin, but on smoggy days, air pollution emissions from within the basin are the most significant. The South border area receives air pollution inflow, transported from the Bay Area or San Joaquin Valley air basins. On many summer days, a "delta breeze" blows toward Sacramento from the ocean through the Carquinez Strait. These winds can transport air pollution from the Bay Area to the Sacramento air basin.

The delta breeze moves Sacramento's air pollution up toward the north end of the Sacramento Valley and East into the Sierra Nevada foothills. On days when wind blows from the North, Sacramento air pollution can be transported to the South into the San Joaquin Air Basin.

Air Pollutants and Ambient Air Quality Standards

Ambient air quality is affected by pollutants emitted from stationary and mobile sources. Stationary sources are often divided into point sources and area sources. Point sources consist of one or more emission sources at a facility with an identified location and are usually associated with manufacturing and industrial processing plants. Area sources are widely distributed and consist of many small emission sources. Area source examples include lawnmowers and other landscape maintenance

equipment, natural gas fired water and space heaters, and consumer products such as paints, hairspray, deodorant, and similar products with evaporative emissions. Mobile sources refer to emissions from motor vehicles, including tailpipe, evaporative, and fugitive emissions.

Air pollutants emitted by stationary and mobile sources are regulated by federal and state law. These regulated pollutants are known as "criteria air pollutants", and are emitted as primary and secondary pollutants.

Primary criteria air pollutants are those that are emitted directly from sources. Carbon monoxide (CO), nitrogen oxides (NOx), sulfur dioxide (SO_2), and most forms of particulate matter (PM10 and PM2.5) are primary air pollutants. Secondary criteria air pollutants are those formed by chemical and photochemical reactions in the atmosphere. Ozone and nitrogen dioxide are the principal secondary pollutants.

The U.S. Environmental Protection Agency has developed National Ambient Air Quality Standards (NAAQS) for the criteria air pollutants. At the state level, the California Air Resources Board has developed California Ambient Air Quality Standards (CAAQS). Table 1 shows the NAAQS and CAAQS. Areas that do not meet the NAAQS and/or CAAQS are classified as nonattainment areas.

The SVAB is nonattainment for the federal and state ozone, and PM2.5 standards. The Placer County portion of the SVAB is in nonattainment for federal PM10 standards (Table 2).

Ozone

Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials. Ozone is a severe eye, nose, and throat irritant. Ozone also attacks synthetic rubber, textiles, plants, and other materials; it causes extensive damage to plants, such as leaf discoloration and cell damage.

State standards for ozone have been set for a 1-hour averaging time. The state 1-hour ozone standard is 0.09 ppm, not to be exceeded. EPA recently replaced the 1-hour federal ozone standard with an 8-hour standard of 0.075 ppm, while ARB recently enacted a state 8-hour standard of 0.07 ppm.

Ozone is not emitted directly into the air, but is formed by a photochemical reaction in the atmosphere. Ozone precursors, including reactive organic gases (ROGs) and oxides of nitrogen (NO_x), react in the

atmosphere in the presence of sunlight to form ozone. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem. ROG and NO_x are emitted by mobile sources and stationary combustion equipment.

Table 1. California and National Ambient Air Quality Standards

Pollutant	Averaging Time	CAAQS[a]	NAAQS[b]
Ozone (O_3)	1 hour	0.09 ppm	NA
	8 hours	0.070 ppm	0.075 ppm
Carbon monoxide (CO)	1 hour	20 ppm	35 ppm
	8 hours	9.0 ppm	9 ppm
Nitrogen dioxide (NO_2)	1 hour	0.18 ppm	NA
	Annual	0.030 ppm	0.053 ppm
Sulfur dioxide (SO_2)	1 hour	0.25 ppm	NA
	3 hours	NA	0.5 ppm
	24 hours	0.04 ppm	0.14 ppm
	Annual	NA	0.03 ppm
Inhalable particulate matter (PM10)	24 hours	50 µg/m^3	150 µg/m^3
	Annual	20 µg/m^3	NA
Fine particulate matter (PM2.5)	24 hours	NA	35 µg/m^3
	Annual	12 µg/m^3	15 µg/m^3
Sulfates	24 hours	25 µg/m^3	NA
Lead (Pb)	30 days	1.5 µg/m^3	NA
	Calendar quarter	NA	1.5 µg/m^3
Hydrogen sulfide	1 hour	0.03 ppm	NA
Vinyl chloride	24 hours	0.010 ppm	NA

Source: California Air Resources Board 2008a.

Note: NA = not applicable, ppm = parts per million.

[a]The CAAQS for ozone, CO, SO_2 (1- and 24-hour), NO_2, PM10, and PM2.5 are values not to be exceeded. All other California standards shown are values not to be equaled or exceeded.

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

Table 2. Sacramento Valley Air Basin State and National Ambient Air Quality Attainment Status

Air Pollutant	Attainment Status – SVAB
Ozone (O_3)	Nonattainment for NAAQS 8–hour; nonattainment for CAAQS 1-hour and 8-hour
Carbon monoxide (CO)	Attainment/maintenance for federal standards; unclassified for state standards
Nitrogen dioxide (NO_2)	Attainment
Sulfur dioxide (SO_2)	Attainment
Suspended particulate matter (PM10)	Attainment for NAAQS; nonattainment for CAAQS
Particulate matter (PM2.5)	Nonattainment for NAAQS; nonattainment for CAAQS
Sulfates	Attainment
Lead (Pb)	Attainment
Hydrogen sulfide	Unclassified

Source: California Air Resources Board, 2009a.

Table 3 shows monitoring results for the ozone monitoring station closest to the proposed project, which is located in the City of Roseville. This station shows several violations of the state and federal ozone standards during the most recent three years of monitoring.

Table 3. Ozone Monitoring Results at the Roseville North Sunrise Monitoring Station

Ozone (O3)	2006	2007	2008
Highest 1-hour average, ppm	0.121	0.109	0.134
Highest 8-hour average, ppm	0.097	0.100	0.106
Days > state 1-hour standard	16	4	20
Days > state 8-hour standard	38	20	38
Days > federal 8-hour standard	0	0	2
Percent of year covered	99	96	99

Sources: California Air Resources Board 2009b.

Carbon Monoxide

CO is inert to plants and materials but can significantly affect human health. CO is a public health concern because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. Effects on humans range from slight headaches and nausea to death.

State and federal CO standards have been set for both 1- and 8-hour averaging times. The state 1-hour standard is 20 ppm, and the federal 1-hour standard is 35 ppm. Both the state and federal standards for the 8-hour averaging period are 9 ppm.

Motor vehicles are the dominant source of CO emissions in most areas. High CO levels develop primarily during winter when light winds combine with the formation of ground-level temperature inversions typically from evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures.

No CO monitoring is currently conducted in Placer County. The closest CO monitoring station is located in Sacramento County. The results from the last three years of monitoring are shown in Table 4. No violations of either the state or federal CO standards were recorded at this monitoring station during the most three recent years.

Oxides of Nitrogen

NO_x contributes to smog and can injure plants and animals and affect human health. NO_x also contributes to acidic deposition and reacts with ROG in the presence of sunlight to form photochemical smog. NO_x concentrations result in a brownish color because they absorb the blue-green area of the visible spectrum, greatly affecting visibility.

NO_x is emitted primarily by combustion sources, including both mobile and stationary sources. NO_x also is emitted by a variety of area sources, ranging from wildfires and prescribed fires to water-heating and space-heating systems powered by fossil fuels.

The state NO_x standard is 0.18 ppm for the 1-hour average and 0.03 ppm for the annual average. The federal NO_x standard is 0.053 ppm on an annual average. No violations of the NOx standard were recorded in the SVAB during the three recent years of monitoring.

PM10 and PM2.5

Health concerns associated with suspended particulate matter (PM) focus on those particles small enough to reach the lungs when inhaled. PM can damage human health and retard plant growth, as well as reduce visibility, soil buildings and other structures, and corrode materials.

The state PM10 standards are 50 µg/m^3 as a 24-hour average and 20 µg/m^3 as an annual geometric mean. The federal PM10 standard is 150 µg/m^3 as a 24-hour average. The federal annual PM10 standard of 50 µg/m^3 was recently dropped.

Table 4. Carbon Monoxide Monitoring Results at the North Highlands-Blackfoot Way Monitoring Station

Carbon Monoxide (CO)	2006	2007	2008
Highest 1-hour average, ppm	2.70	1.73	1.90
Highest 8-hour average, ppm	2.70	1.70	1.80

Sources: California Air Resources Board 2009b; U.S. Environmental Protection Agency, 2009.

The federal PM2.5 standards are 35 µg/m^3 as a 24-hour average and 15 µg/m^3 as an annual average. The state PM2.5 standard equals 12 µg/m^3 on an annual average.

PM10 and PM2.5 emissions are generated by a wide variety of sources, including agriculture, industrial activities, dust suspended by vehicle traffic, and secondary aerosols formed by reactions in the atmosphere.

Table 5 shows the past three years worth of PM10 and PM2.5 monitoring results for the Roseville North Sunrise monitoring station. Two violations of the state PM10 standards were recorded at this monitoring location. The Roseville North Sunrise monitoring station also recorded several violations of the federal 8 hour PM2.5 standard during the most recent three years.

Table 5. Particulate Matter Monitoring Results at the Roseville North Sunrise Monitoring Station

Particulate Matter (PM10)	**2006**	**2007**	**2008**
Highest 24-hour average, µg/m^3	**55.0**	**45.0**	**73.9**
Days > state standard[a]	1	0	1
Days > federal standard[a]	0	0	0
Percent of year covered	100	98	100
Particulate Matter (PM2.5)	**2006**	**2007**	**2008**
Highest 24-hour average, µg/m^3	54.7	48.7	49.7
Days > federal standard[a]	11.5	0	6.5
Percent of year covered	100	96	92

Note: Underlined values represent those in excess of applicable NAAQS. **Bold values** represent those in excess of the applicable CAAQS.

Source: California Air Resources Board, 2009b.

[a]Days over state or federal standards are measured days, not estimated days.

Sulfur Dioxide

The major health concerns associated with inhalation of SO_2 include effects on breathing, respiratory illness, alterations in pulmonary defenses, and aggravation of existing cardiovascular disease. Children, the elderly, and people with asthma, cardiovascular disease, or chronic lung diseases—such as bronchitis or emphysema—are most susceptible to adverse health effects from exposure to SO_2. SO_2 is a precursor to sulfates, which are associated with acidification of lakes and streams, accelerated corrosion of buildings and monuments, reduced visibility, and other adverse health effects.

EPA's health-based NAAQS for SO_2 is 0.03 ppm measured as an annual arithmetic mean concentration, 0.14 ppm measured over a 24-hour period, and 0.5 ppm measured over a 3-hour average period. California's SO_2 standard is 0.04 ppm measured over a 24-hour average period and 0.25 ppm measured over 1-hour.

SO_2 belongs to the family of gases called sulfur oxides (SO_x). These gases are formed when fuel containing sulfur (mainly coal and oil) is burned, and also during metal smelting and other industrial processes.

Sensitive Receptors

Some receptors are considered more sensitive than others to air pollutants. The reasons for greater than average sensitivity include health problems, proximity to emission sources, or duration of exposure to air pollutants. Sensitive receptors are typically defined as locations where human populations, especially children, seniors, or sick persons, are found, and there is reasonable expectation of continuous human exposure. Examples of land uses considered to be sensitive receptors are residences, hospitals, and schools.

Greenhouse Gases and Climate Change

Global climate change is caused by GHG emissions, which are caused by several activities, including combustion of fossil fuels, deforestation, and land use change.

GHGs play a critical role in the Earth's radiation budget by trapping infrared radiation emitted from the Earth's surface, which could have otherwise escaped to space. Prominent GHGs contributing to this process include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and certain refrigerants that include chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), and hydrofluorocarbons (HFCs). This phenomenon, known as the "greenhouse effect", keeps the Earth's atmosphere near the surface warmer than it would be otherwise and allows for successful habitation by humans and other forms of life.

Global warming potential (GWP) is a measure of how much a given mass of GHG is estimated to contribute to global warming. It is a relative scale which compares the gas in question to that of the same mass of carbon dioxide (whose GWP is by definition 1). In this analysis, CH_4 is assumed to have a GWP of 21 and N_2O has a GWP of 310 (California Climate Action Registry, 2009). Refrigerants have GWP's that range from 76 up to 12,240 (U.S. Green Building Council, 2007). Consequently, using each pollutant's GWP, emissions of CO_2, CH_4, N_2O, CFCs, HCFCs, and HFCs can be converted into CO_2 equivalence, also denoted as CO_2e.

Fossil fuel combustion removes carbon stored underground and releases it into the active carbon cycle, thus increasing concentrations of GHGs in the atmosphere. Emissions of GHGs in excess of natural ambient concentrations are theorized to be responsible for the enhancement of the greenhouse effect and contribute to what is termed "global warming", a trend of unnatural warming of the Earth's natural climate. Increases in these gases lead to more absorption of radiation and warm the lower

atmosphere further, thereby increasing evaporation rates and temperatures near the surface. Climate change is a global problem, and GHGs are global pollutants, unlike criteria pollutants (such as ozone, carbon monoxide, and particulate matter) and toxic air contaminants (TACs), which are pollutants of regional and local concern.

The Intergovernmental Panel on Climate Change (IPCC) was established by the World Meteorological Organization and United Nations Environment Programme. IPCC's mission is to assess scientific, technical, and socioeconomic information relevant to the understanding of climate change, including the potential impacts and options for adaptation and mitigation. IPCC predicts substantial increases in global temperatures of between 1.1 to 6.4 degrees Celsius, depending on the scenario (Intergovernmental Panel on Climate Change 2007).

Climate change could impact California's natural environment in the following ways (California Energy Commission 2005):

- Rising sea levels along the California coastline, particularly in San Francisco and the Sacramento-San Joaquin River Delta due to ocean expansion;
- Extreme heat conditions, such as heat waves and very high temperatures, which could last longer and become more frequent;
- An increase in heat-related human deaths and infectious diseases and a higher risk of respiratory problems caused by deteriorating air quality;
- Reduce snow pack and stream flow in the Sierra Nevada mountains, affecting winter recreation and water supplies;
- Potential increase in the severity of winter storms, affecting peak stream flows and flooding;
- Changes in growing season conditions that could affect California agriculture, causing variations in crop quality and yield; and
- Changes in distribution of plant and wildlife species due to changes in temperature, competition of colonizing species, changes in hydrologic cycles, changes in sea levels, and other climate-related effects.

These changes in California's climate and ecosystems could occur at a time when California's population is expected to increase from 34 million to 59 million by the year 2040 (California Energy Commission 2005).

Consequently, for a "business as usual" scenario, increases are expected in the amount of anthropogenic GHG emissions and the number of people potentially affected by climate change. Similar changes as those noted above for California would also occur in other parts of the world.

Transportation generates 41 percent of California's GHG emissions, followed by the industrial sector (23%), electricity generation (20%), agriculture and forestry (8%), and other sources (8%). Emissions of CO_2 and N_2O are byproducts of fossil fuel combustion, among other sources. Methane, a highly potent GHG, results from off-gassing associated with agricultural practices and landfills. Sinks of carbon dioxide include uptake by vegetation and dissolution into the ocean. In 2004, California generated 524 million metric tons of GHG measured as CO_2 equivalent (CO_2e) emissions (California Air Resources Board, 2007).

Regulatory Setting

Federal

Federal air quality laws regulate air pollutants, primarily through industry-specific standards and planning requirements. The primary legislation that governs federal air quality regulations is the Clean Air Act Amendments of 1990. Federal air quality laws regulate criteria, toxic, and nuisance air pollutant emissions from industrial sources.

As mentioned earlier, criteria pollutants are substances for which the U.S. Environmental Protection Agency (EPA) has established the NAAQS. Noncriteria air pollutants, also known as toxic air contaminants (TACs), are airborne substances capable of causing adverse health effects as a result of short-term (acute) or long-term (chronic) exposure.

Nuisance pollutants are substances that can result in complaints from the population about adverse impacts on quality of life. The nuisance pollutants regulated by the air districts are odors and visible plumes (smoke).

State

Criteria Pollutants

The California Air Resources Board (ARB), which is part of the California Environmental Protection Agency (Cal-EPA), develops air quality regulations at the state level. The state regulations mirror federal regulations by establishing industry-specific pollution controls for criteria, toxic, and nuisance pollutants. California also requires areas to develop plans and strategies for attaining California ambient air quality standards (CAAQS) as set forth in the California Clean Air Act of 1988. As described above, California has developed ambient standards for the criteria pollutants equal to or more stringent than the federal standards.

Air Toxics

State requirements specifically address air toxics issues through Assembly Bill (AB) 1807 (known as the Tanner Bill), which established the state air toxics program, and AB 2588, the Air Toxics Hot Spots Information and Assessment Act. The air quality regulations developed from these bills have been modified recently to incorporate the federal regulations associated with the federal Clean Air Act Amendments of 1990.

The Air Toxics Hot Spots Information and Assessment Act (AB 2588, 1987, Connelly) (Hot Spots Act) was enacted in September 1987. Under this bill, stationary sources of emissions are required to report the types and quantities of certain substances that their facilities routinely release into the air.

Local

At the local level, air quality is managed through land use and development planning practices. These practices are implemented through general planning processes. The Placer County Air Pollution Control District (PCAPCD) is responsible for establishing and enforcing local air quality rules and regulations that address the requirements of federal and state air quality laws. Specifically, the PCAPCD is responsible for monitoring air quality and planning, implementing, and enforcing programs designed to attain and maintain state and federal ambient air quality standards in the area. Programs developed include air quality rules and regulations that regulate stationary source emissions, including area and point sources and certain mobile source emissions. The PCAPCD is also responsible for establishing permitting requirements and issuing

permits for stationary sources and ensuring that new, modified, or relocated stationary sources do not create net emissions increases. The PCAPCD enforces air quality rules and regulations through a variety of means, including inspections, educational and training programs, and fines.

Greenhouse Gas Emissions and Global Climate Change Regulatory Environment

Several recent state-level actions have been taken to limit greenhouse gas (GHG) emissions implicated in global warming. Those actions are described below.

Executive Order S-3-05

On June 1, 2005, California Governor Arnold Schwarzenegger issued Executive Order S-3-05. It included the following GHG emission reduction targets: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; by 2050, reduce GHG emissions to 80% below 1990 levels. To meet the targets, the governor directed several state agencies to cooperate in the development of a climate action plan. The secretary of Cal-EPA leads the Climate Action Team (CAT), whose goal is to implement global warming emission reduction programs identified in the climate action plan and to report on the progress made toward meeting the emission reduction targets established in the executive order.

The first report to the governor and the legislature was released in March 2006 and will be issued bi-annually thereafter. The CAT report to the governor contains recommendations and strategies to help ensure the targets in Executive Order S-3-05 are met (California Environmental Protection Agency 2006).

California Global Warming Solutions Act of 2006 (Assembly Bill 32)

In 2006, the California state legislature adopted the California Global Warming Solutions Act of 2006 (AB 32). AB 32 establishes a cap on statewide GHG emissions and sets forth the regulatory framework to achieve the corresponding reduction in statewide emission levels. Under AB 32, GHGs are defined as carbon dioxide (CO_2), methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

AB 32 requires that ARB:

- adopt early action measures to reduce GHGs.;

- establish a statewide GHG emissions cap for 2020 based on 1990 emissions;
- adopt mandatory report rules for significant GHG sources;
- adopt a scoping plan indicating how emission reductions will be achieved via regulations, market mechanisms, and other actions; and
- adopt regulations needed to achieve the maximum technologically feasible and cost-effective reductions in GHGs.

Early Action Measures

ARB has adopted several early action measures to reduce GHG. They include things such as improvements to landfill methane capture, a vehicle tire pressure program, improvements to heavy duty truck efficiency, and a low carbon fuels standard (LCFS). On April 23, 2009, the California Air Resources Board adopted a LCFS. This standard requires that all fuels sold in California must have a reduced carbon content that will lower emissions by 10% by 2020.

Guidance and protocols for businesses and governments to facilitate GHG emission reductions were approved as early action items by the Board at its June 2007 hearing. A Local Government Toolkit was designed to provide guidance and resources to help cities and counties reduce greenhouse gas emissions and save money. No specific regulations have yet been set by the California Air Resources Board that apply specifically to cities and counties.

A variety of tools are available to assist with climate action planning including information on:

- How to calculate and inventory current GHG emissions
- A recommended target to reduce GHG emissions
- Cost-saving strategies to take action now
- Financial resources to get started
- Case studies to learn what other cities have been able to accomplish

Phase II of the Toolkit will include a decision support tool to help local governments develop customized climate action plans, a peer-networking online discussion forum, and a climate leadership recognition program to recognize achievements for measured GHG emission reductions.

California's Scoping Plan and GHG Emissions Cap

In its recently released Climate Change Scoping Plan (2008), ARB lays out the GHG reductions that need to be achieved, and the types of measures that will be used to reach them. The Plan shows that California's 1990 GHG emissions equaled 427 million metric tons CO_2e, 2002-2004 average emissions equaled 469 million metric tons CO_2e, and 2020 GHG emissions would equal 596 million metric tons CO_2e. Consequently, compared to 1990, emissions would need to be reduced by 169 million metric tons CO_2e, and about 42 million metric tons from 2002-2004 levels (ARB, 2008b).

The measures that will be used to achieve these emission reductions include the early action measures described above, plus 18 additional categories of measures:

1) California Cap-and-Trade Program
2) California Light-Duty Vehicle GHG Gas Standards
3) Energy Efficiency
4) Renewables Portfolio Standard
5) Low Carbon Fuel Standard
6) Regional Transportation-Related GHG Targets
7) Vehicle Efficiency Measures
8) Goods Movement
9) Million Solar Roofs Program
10) Medium/Heavy-Duty Vehicles
11) Industrial Emissions
12) High Speed Rail
13) Green Building Strategy
14) High Global Warming Potential Gases
15) Recycling and Waste
16) Sustainable Forests
17) Water
18) Agriculture

The California Air Resources Board has initiated development of measures for each of these categories.

SB 375

This regulation, enacted in September 2008, is designed to control GHGs by limiting urban sprawl. It requires metropolitan planning organizations (MPOs) to include sustainable communities strategies (SCS), as defined, in their regional transportation plans (RTPs) for the purpose of reducing greenhouse gas emissions. SB 375 also aligns planning for transportation and housing, and creates specified incentives for the implementation of the strategies.

Senate Bill 97

Senate Bill (SB) 97, signed in August 2007, acknowledges that climate change is an important environmental issue that requires analysis under the California Environmental Quality Act (CEQA). The bill directs the Governor's Office of Planning and Research (OPR) to prepare, develop, and transmit to the California Resources Agency guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, by July 1, 2009. The California Resources Agency is required to certify or adopt those guidelines by January 1, 2010.

Actions Taken by the Governor's Office of Planning and Research

In June 2008, OPR issued a Technical Advisory on CEQA and Climate Change (California Office of Planning and Research 2008). This document recommends that for projects subject to CEQA, emissions be calculated and mitigation measures be identified to reduce those emissions. The OPR report does not identify emission thresholds for GHGs, but instead recommends that each lead agency develop its own thresholds.

On April 13, 2009, OPR submitted to the Secretary for Natural Resources its proposed amendments to the state CEQA Guidelines for greenhouse gas emissions, as required by Senate Bill 97 (Chapter 185, 2007). These proposed CEQA Guideline amendments would provide guidance to public agencies regarding the analysis and mitigation of the effects of greenhouse gas emissions in draft CEQA documents. The Natural Resources Agency will conduct formal rulemaking in 2009, prior to certifying and adopting the amendments, as required by Senate Bill 97 (California Office of Planning and Research, 2009).

Actions Taken by California Attorney General's Office

The California Attorney General (AG) has filed comment letters under CEQA about a number of proposed projects. The AG has also filed several complaints and obtained settlement agreements for CEQA documents covering general plans and individual programs that the AG found either failed to analyze GHG emissions or failed to provide

adequate GHG mitigation. The AG's office has prepared a report that lists measures that local agencies should consider under CEQA to offset or reduce global warming impacts. The AG's office also has prepared a chart of modeling tools to estimate GHG emissions impacts of projects and plans. The GHG analysis described in this chapter uses two of the tools listed by the AG: URBEMIS and EMFAC. URBEMIS was used to estimate area source emissions, such as space and water heating. Information on the AG's actions can be found on at the California Department of Justice Office of Attorney General web site (California Department of Justice 2008).

California Air Pollution Control Officers Association Guidance

The California Air Pollution Control Officers Association (CAPCOA) released a report in January 2008 that describes methods to estimate and mitigate GHG emissions from projects subject to CEQA. The CAPCOA report evaluates several GHG thresholds that could be used to evaluate the significance of a project's GHG emissions. The CAPCOA report, however, does not recommend any one threshold. Instead, the report is designed as a resource for public agencies as they establish agency procedures for reviewing GHG emissions from projects subject to CEQA (California Air Pollution Control Officers Association 2008).

Impact Analysis

Significance Thresholds

The PCAPCD regulates and oversees air quality within the SVSP area and has recommended the following thresholds to determine whether or not a project will result in a significant impact to air quality:

- Exceed the PCAPCD thresholds for regional emissions:
  - Reactive Organic Gases (ROG): 82 lbs/day
  - Nitrogen Oxides (NOX): 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 parts per million (ppm) or the 8-hour 9 ppm air quality standards;

- Result in a cumulatively considerable net increase in any criteria air pollutant for which the project region is nonattainment;

- Expose sensitive receptors to substantial pollutant concentrations, or;

- Create objectionable odors affecting a substantial number or people.

Approach and Methodology

Construction Emissions Methodology

The SVSP project includes development of commercial, public, and utility land uses. URBEMIS2007 Version 9.2.4 was used to estimate emissions resulting from the construction of the SVSP project, beginning in 2013 with completion by 2025. The proposed project would be built in 4 phases. Emissions were estimated for each year of construction. A detailed list of the assumptions used to estimate construction emissions is included in Appendix A and the modeling results are listed in Appendix B.

Operational Emissions Methodology

Criteria Pollutant Emissions

The SVSP project would generate operational emissions of the criteria pollutants, including ozone precursors (ROG and NO_x), CO, PM10, PM2.5, and SOx. On road traffic emissions generated by the project were estimated using the URBEMIS2007 model and trip generation information provided by the traffic consultant (DKS Associates, 2009).

The URBEMIS2007 model was also used to estimate area source emissions. Area sources include emissions associated with burning natural gas for space and water heating, wood combustion associated with space heating, gasoline combustion to operate landscape maintenance machinery, and evaporative emissions from the use of architectural coatings and consumer products.

Carbon Monoxide Concentrations

Project concentrations from local traffic were evaluated by modeling roadside CO concentrations. CO modeling was conducted for the five most highly congested road links and associated intersections identified in

the traffic report (DKS Associates, 2009). All road links shown in the circulation element with level of service (LOS) of D, E, or F were identified and the five with the highest traffic volumes were evaluated for CO concentrations.

The analysis used the CALINE4 line source dispersion model and procedures developed by Caltrans and approved by EPA (Garza, et. al. 1997). CO concentrations were modeled using traffic volumes, emissions, meteorology, and the roadway/receptor geometry. This analysis used meteorological conditions most conducive to high CO concentrations in the SVAB. Appendix A contains additional information describing how CO modeling was conducted.

Toxic Air Contaminants

Potential health risks associated with the proposed project were evaluated qualitatively. First, sensitive receptors that could be exposed to TAC emissions were identified. These included residences and schools located adjacent to the SVSP commercial land use areas. Sensitive receptors also include residential areas and schools within the SVSP that could be exposed to TACs either from within the SVSP or from adjacent areas. Then, those residential land uses were evaluated to determine whether they were downwind of the industrial areas.

In addition, sensitive land uses were examined to identify proximity to highways and arterials with high traffic volumes. Several studies have shown health effects associated with the distance between residences and traffic levels (California Air Resources Board, 2005). These studies have found a link between traffic-related emissions and adverse health effects within 1,000 feet of roads, with the effects strongest within 300 feet. This indicates that the adverse effects diminish with distance. Consequently, the California Air Resources Board recommends against siting new sensitive land uses within 500 feet of a freeway or urban roads at or exceeding 100,000 average annual daily trips (AADT) (California Air Resources Board, 2005).

Odors

Potential odor impacts were evaluated by examining the distances from existing and proposed odor sources (areas designated for industrial land uses) to sensitive receptors such as residences. The analysis also considers prevailing wind direction and policies designed to minimize odor impacts. Odor sources typically include industrial land uses, such as fiberglass manufacturing, coating operations, foundries, refineries, sewage treatment plants, landfills, and recycling facilities (California Air Resources Board, 2005).

Greenhouse Gas Emissions Methodology

Transportation and area source GHG emissions were estimated using the same approach as described above under criteria pollutant emissions. GHGs produced by electricity generation and from solid waste disposal were also estimated. For electricity, both direct and indirect electricity use was estimated. For residential land uses in the 2035 cumulative buildout, direct electricity use was estimated using the California Energy Commission's (CEC's) Residential Appliance Saturation Survey (KEMA-XENERGY, Itron, and RoperASW, 2004). The CEC database contains information on kilowatts consumed per square foot for various types of commercial land uses (Itron, Inc., 2006). For residential land uses, direct electricity use was estimated using the Utilities study performed by CapitolUtility Specialists for the proposed project (CapitolUtility Specialists 2009).

The analysis also estimated indirect electricity use associated with water consumption and wastewater treatment. Estimates of water-related energy use were based on a report prepared for the California Energy Commission (Pacific Institute 2005).

Once total electricity use was estimated, the GHGs associated with that electricity use were estimated using emission factors developed by the California Climate Action Registry (2009).

Emissions from the solid waste generated by the proposed project were estimated based on predicted population for 2025 and 2035 and California Air Resources Board methane emissions estimates per standard cubic foot of landfill gas emitted in California (California Air Resources Board 2008b).

Impacts and Mitigation Measures of the SVSP Proposed Development

Criteria Pollutant Emissions, Toxic Air Contaminants, and Odors

Construction of SVSP

Table 6 shows annual construction emissions associated with the proposed SVSP. Construction emissions exceed the 82 pounds per day significance threshold established by the PCAPCD for ROG, NOx, PM10, and PM2.5.

Table 6. Proposed 2025 Buildout Construction Emissions (unmitigated, pound per day)

	ROG	NO_X	CO	SO_2	PM10	PM2.5
Phase A (2013-2016)						
2013	963.8	84.0	109.9	0.2	487.8	105.1
2014	1,177.2	77.9	103.8	0.2	486.0	104.4
2015	981.5	54.9	94.6	0.2	484.4	103.0
2016	688.2	64.9	65.8	0.1	425.3	91.2
Phase B (2017-2019)						
2017	1,784.7	56.4	133.8	0.3	736.7	155.6
2018	1,464.3	42.1	105.3	0.2	676.7	142.6
2019	1,707.1	38.4	99.6	0.2	676.4	142.4
Phase C (2020-2023)						
2020	1,486.1	56.8	101.3	0.2	690.3	146.1
2021	1,131.9	46.9	67.9	0.2	557.6	118.1
2022	1,165.1	35.0	61.2	0.2	557.6	118.1
2023	1,200.3	46.9	61.3	0.2	557.6	118.1
Phase D (2024)						
2024	1,134.1	46.8	69.8	0.2	600.0	127.0

Note: Emissions estimated with URBEMIS2007, version 9.2.4. Detailed description of modeling assumptions included in Appendix A.

Mitigation Measure AQ-1: The following measures will reduce construction-related ROG, NOx, PM10 and PM2.5 emissions:

- All construction equipment shall be maintained in good operating condition. Contractor shall ensure that all construction equipment is being properly serviced and maintained as per the manufacturer's specifications. Maintenance records shall be available at the construction site for verification. This measure will reduce combustion emissions of all criteria air pollutants.

- Prior to the issuance of any grading permits, all applicants shall submit construction plans denoting the proposed schedule and projected equipment use. Construction contractors shall provide evidence that low emission mobile construction will be used, or that their use was investigated and found to be infeasible for the project. Low emission equipment is defined as meeting the California Air Resources Board's Tier III standards. Contractors shall also conform to any construction measures imposed by the PCAPCD as well as City Planning Staff. This measure will primarily reduce ROG, NOx, PM10, and PM2.5 exhaust emissions.

- 5Paints and coating shall be applied either by hand or by high volume, low-pressure spray. This measure will reduce evaporative ROG emissions.

- All construction shall comply with the following measures to reduce fugitive dust related emissions of PM10 and PM2.5:

  - Maintain a minimum 24-inch freeboard on soil haul trucks or cover payloads using tarps or other suitable means.
  - Suspend grading operations during high winds.
  - Sweep streets as necessary if silt is carried off-site to adjacent public thoroughfares or occurs as a result of hauling.
  - Dispose of surplus excavated material in accordance with local ordinances and use sound engineering practices.
  - Schedule activities to minimize the amounts of exposed excavated soil during and after the end of work periods.
  - Phase grading to prevent the susceptibility of large areas to erosion over extended periods of time.
  - Pave or apply gravel to any on-site haul roads.
  - Reestablish ground cover on the construction site through seeding and water.

Table 7 shows estimated emissions of criteria pollutants after mitigation. With mitigation in place, emissions of ROG, NOx, and PM10 emissions would still exceed PCAPCD's 82 pounds per day significance threshold.

Table 7. Proposed 2025 Buildout Construction Emissions (mitigated, pound per day)

	ROG	NO_X	CO	SO_2	PM10	PM2.5
Phase A (2013-2016)						
2013	868.2	79.9	109.9	0.2	113.0	26.0
2014	1,060.1	74.09	103.8	0.2	112.3	25.6
2015	883.9	54.9	94.6	0.2	111.8	25.2
2016	619.8	61.5	65.8	0.1	98.2	22.3
Phase B (2017-2019)						
2017	1,606.9	56.4	133.8	0.3	169.0	37.1
2018	1,318.4	42.1	105.3	0.2	154.9	33.7
2019	1,536.9	38.4	99.6	0.2	154.7	33.5
Phase C (2020-2023)						
2020	1,338.0	53.5	101.33	0.2	157.9	34.3
2021	1,019.0	44.0	67.9	0.2	127.5	27.7
2022	1,048.9	35.0	61.2	0.2	127.4	27.6
2023	1,080.6	43.9	61.3	0.2	127.5	27.7
Phase D (2024)						
2024	1,021.0	43.9	69.8	0.2	137.1	29.8

Note: Emissions estimated with URBEMIS2007, version 9.2.4. Detailed description of modeling assumptions included in Appendix A. Modeling results are listed in Appendix B.

Construction of SVSP Alternatives

Alternative 1 – Increased Avoidance, Increased Density

Construction of Alternative 1, the increased avoidance, increased density alternative, would result in slightly lower PM10 and PM2.5 emissions as compared to the preferred SVSP option. This is because with increased open space, less grading would be required. Site grading is the largest single source of PM10 and PM2.5 dust emissions associated with construction. Alternative 1's emissions of other criteria pollutants, including ROG and NOx, would likely be similar to or lower than the preferred SVSP option because it would entail denser development, including more multi-family and less single family residences.

Even with lower emissions, construction of Alternative 1 would result in a significant impact because emissions of ROG, NOx, and PM10 would exceed the PCAPCD's significance thresholds. Implementation of Mitigation Measure AQ-1 would reduce emissions, but those emissions would still exceed the PCAPCD's thresholds.

Alternative 2 – Increased Avoidance, Same Density

Alternative 2, the increased avoidance, same density alternative, would result in lower PM10 and PM2.5 emissions as compared to the preferred

SVSP option. This is because with increased open space, less grading would be required. Site grading represents the largest single source of PM10 and PM2.5 dust emissions associated with construction. The emissions of other criteria pollutants, including ROG and NOx, would also be lower than the preferred SVSP option.

Construction of Alternative 2 would result in a significant impact because emissions of ROG, NOx, and PM10 would exceed the PCAPCD's significance thresholds. Implementation of Mitigation Measure AQ-1 would reduce emissions, but those emissions would still exceed the PCAPCD's thresholds.

Alternative 3 – Same Footprint, Reduced Density

Alternative 3, the project footprint, reduce density alternative, would result in similar PM10 and PM2.5 emissions as compared to the preferred SVSP option. However, with fewer residential units, emissions of ROG and NOx would be lower than the preferred SVSP option.

Alternative 3 would result in a significant impact because emissions of ROG, NOx, and PM10 would exceed the PCAPCD's significance thresholds. Implementation of Mitigation Measure AQ-1 would reduce emissions, by those emissions would still exceed the PCAPCD's thresholds.

Alternative 4 – No Project

Alternative 4, the no project alternative, would generate no construction emissions.

Operation

The Placer County General Plan currently designates most of the project site as agriculture/timberland. The majority of the project site is undeveloped and has historically been used for agricultural or grazing activities. There are four large-lot single-family residences in the central and southwestern portion of the project site, and other smaller structures along Baseline Road associated with ongoing dry farming agricultural production activities. Since the area is largely undeveloped, existing criteria pollutant emissions on the project site are negligible.

Buildout of the project will result in the generation of criteria pollutant emissions from mobile and area source emissions. Table 8 summarizes emissions associated with operation of the 2025 buildout, 2035 cumulative buildout, and Alternatives 1, 2, and 3. The estimates represent peak

summer emissions. For each alternative, emissions easily exceed the PCAPCD thresholds for ROG, NOx, CO, and PM10. No mitigation measures are available that would reduce these emissions to levels that are less than the thresholds. However, several mitigation measures listed under the GHG impact discussion would reduce both criteria pollutant and GHG emissions.

Table 8. Comparison of Criteria Pollutant Emissions Generated by Specific Plan Buildout (2025), Cumulative Buildout (2035) and Alternatives 1, 2, and 3 (unmitigated, pounds per day)

Alternative	ROG	NOx	CO	SO_2	PM10	PM2.5	CO_2
Specific Plan Buildout (2025)							
Area Sources	492.3	170.6	245.7	0.01	0.7	0.7	207,830.5
Transportation	1,093.2	823.4	9,334.4	18.7	3,224.3	613.5	1,920,726.3
Total	1,585.5	993.9	9,580.1	18.7	3,225.0	614.2	2,128,556.8
Cumulative Buildout (2035)							
Area Sources	704.5	220.6	307.6	0.01	0.9	0.8	269,680.2
Transportation	2,776.0	3,232.8	27,920.8	23.1	3,975.7	775.3	2,361,491.0
Total	3,480.5	3,453.3	28,228.4	23.1	3,976.6	776.2	2,631,171.2
Alternative 1 (2025)							
Area Sources	439.1	134.6	121.7	0.00	0.4	0.3	165,076.9
Transportation	851.1	639.8	7,275.0	14.6	2,516.6	478.8	1,499,022.6
Total	1,290.2	774.42	7,396.7	14.6	2,516.9	479.1	1,664,099.5
Alternative 2 (2025)							
Area Sources	363.4	123.2	181.9	0.00	0.5	0.5	150,108.9
Transportation	763.8	580.1	6,612.7	13.3	2,291.1	435.9	1,364,517.0
Total	1,127.2	703.3	6,794.6	13.3	2,291.6	436.4	1,514,625.9
Alternative 3 (2025)							
Area Sources	413.9	158.6	297.8	0.01	0.8	0.8	192,327.4
Transportation	954.4	717.3	8116.2	16.2	2,802.0	533.2	1,669,098.6
Total	1,368.3	875.9	8,413.9	16.2	2,802.8	534.0	1,861,426.0
PCAPCD Significance Threshold	82	82	550	N/A	82	N/A	N/A
Exceed Threshold?	Yes	Yes	Yes	No	Yes	No	No

Notes: Transportation emissions based on VMT estimates provided for the traffic analysis and EMFAC2007 emission rates. Area source emissions estimated using the URBEMIS2007 model using the proposed land uses proposed for the SVSP proposed buildout and alternatives.

Carbon Monoxide Concentrations

CO concentrations were estimated for the five intersections projected to be most congested in each scenario. A summary of the CO modeling results for 2025 and 2035 is included in Tables 9 and 10. As Tables 9 and 10 show, the maximum 1-hour and 8-hour concentrations for all intersections are substantially less than either the state or federal ambient air quality standards. Since these intersections represent worst case conditions, CO concentrations at all other intersections would also be less than federal or state standards.

The CO results demonstrate that the SVSP project would not cause or contribute to violations of the state or federal CO standards. Consequently, the project would not expose sensitive receptors to substantial concentrations of CO. This is a less than significant impact.

Alternative 1 – Increased Avoidance, Increased Density

CO concentrations associated with Alternative 1 would be slightly lower than those for the preferred SVSP as indicated by the lower levels of CO emissions shown in Table 8. The resulting CO concentrations would not exceed either the state or federal CO standards. The impact is less than significant.

Alternative 2 – Increased Avoidance, Same Density

CO concentrations associated with Alternative 2 would be slightly lower than those for the preferred SVSP as indicated by the lower levels of CO emissions shown in Table 8. The resulting CO concentrations would not exceed either the state or federal CO standards. The impact is less than significant.

Alternative 3 – Same Footprint, Reduced Density

CO concentrations associated with Alternative 3 would be slightly lower than those for the preferred SVSP as indicated by the lower levels of CO emissions shown in Table 8. The resulting CO concentrations would not exceed either the state or federal CO standards. The impact is less than significant.

Alternative 4 – No Project

CO concentrations associated with Alternative 4 would be minimal because no development would occur. The impact is less than significant.

Table 9. Modeled Carbon Monoxide Levels for 2025 Buildout Conditions

		2025 Buildout[1]	
Intersection	Receptor	1-hour CO[2]	8-hour CO[3]
Galleria & Roseville Pkwy	1	12.9	6.4
	2	13.3	6.6
	3	12.9	6.4
	4	12.5	6.1
Pleasant Grove & Roseville Pkwy	5	12.7	6.3
	6	13.2	6.6
	7	12.7	6.3
	8	13.7	6.9
Blue Oaks Blvd & Foothills Blvd	9	12.3	6.0
	10	13.2	6.6
	11	13.3	6.6
	12	12.0	5.8
Foothills Blvd & Pleasant Grove Blvd	13	11.8	5.7
	14	11.8	5.7
	15	11.9	5.8
	16	12.2	6.0
Elverta Rd & Walerga Rd	17	11.8	5.7
	18	11.2	5.4
	19	11.7	5.7
	20	11.5	5.5

Notes:

[1] Background concentrations of 5.73 ppm and 2.06 ppm were added to the modeling 1-hour and 8-hour results, respectively

[2] The federal and state 1-hour standards are 35 and 20 ppm, respectively

[3] The federal and state 8-hour standards are 9 and 9.0 ppm, respectively

Table 10. Modeled Carbon Monoxide Levels for 2035 Cumulative Conditions

		2035 Cumulative[1]	
Intersection	Receptor	1-hour CO[2]	8-hour CO[3]
Galleria & Roseville Pkwy	1	13.0	6.4
	2	13.2	6.6
	3	13.4	6.7
	4	13.1	6.5
Pleasant Grove & Roseville Pkwy	5	12.5	6.1
	6	13.0	6.4
	7	12.4	6.1
	8	13.3	6.6
Blue Oaks Blvd & Foothills Blvd	9	11.4	5.5
	10	12.1	5.9
	11	12.4	6.1
	12	11.7	5.7
Foothills Blvd & Pleasant Grove Blvd	13	11.4	5.5
	14	11.5	5.5
	15	11.5	5.5
	16	11.7	5.7
Elverta Rd & Walerga Rd	17	12.0	5.8
	18	11.3	5.4
	19	11.9	5.8
	20	11.7	5.7

Notes:

[1] Background concentrations of 5.73 ppm and 2.06 ppm were added to the modeling 1-hour and 8-hour results, respectively

[2] The federal and state 1-hour standards are 35 and 20 ppm, respectively

[3] The federal and state 8-hour standards are 9 and 9.0 ppm, respectively

Toxic Air Contaminants (TACs)

The SRVP has the potential to expose sensitive receptors to substantial concentrations of TACs in two ways: 1) by locating residences close to sources of TACs, such as industrial uses or freeways, and 2) by locating sources of TAC, such as industrial uses, upwind of residences and other sensitive receptors. This analysis evaluates the location of sensitive receptors with respect to potential sources of toxic air contaminants: industrial sources and proximity to freeways. This analysis also considers the predominant wind direction in the area.

Figure 3 shows wind rose for the Roseville area. The wind rose represents the direction from which the wind is blowing. The prevailing winds blow from the south and southeasterly directions with occasional winds from the north and northwesterly directions. Winds from the east and the west occur infrequently.

The location of any industrial uses south or southeast of the proposed project could potentially result in the location of residences downwind from industrial sources of TACs. Industrial sources can generate a wide variety of TACs, from fuel combustion, and from the use of hazardous chemicals that could become airborne. The location of Placer Vineyards south and west of the proposed project could create the potential for TACs to be transported into the project area.

Figure 4 shows the western portion of Placer Vineyards in relation to the SVSP. The only Placer Vineyards land use that represents a potential source of TACs to the SVSP is the commercially designated land located at the southeast corner of Watt Avenue and Baseline Road. This Placer Vineyards land use could potentially expose the SVSP residential land uses located on the northwest corner of the Watt Avenue/Baseline Road intersection to health risks.

Mitigation Measure AQ-2. Prior to approving construction of SVSP residences located at the northwest corner of Watt Avenue and Baseline Road, a screening health risk assessment shall be conducted if the approval occurs subsequent to approval of the commercial area within the Placer Vineyard area and that commercial area allows for industrial land uses. If that screening analysis shows potential health risks, then a more detailed health risk assessment should be conducted. If significant acute, chronic, or carcinogenic health risks are predicted, then the proposed residences shall be relocated to a distance that reduces all health risks to less than significant levels.

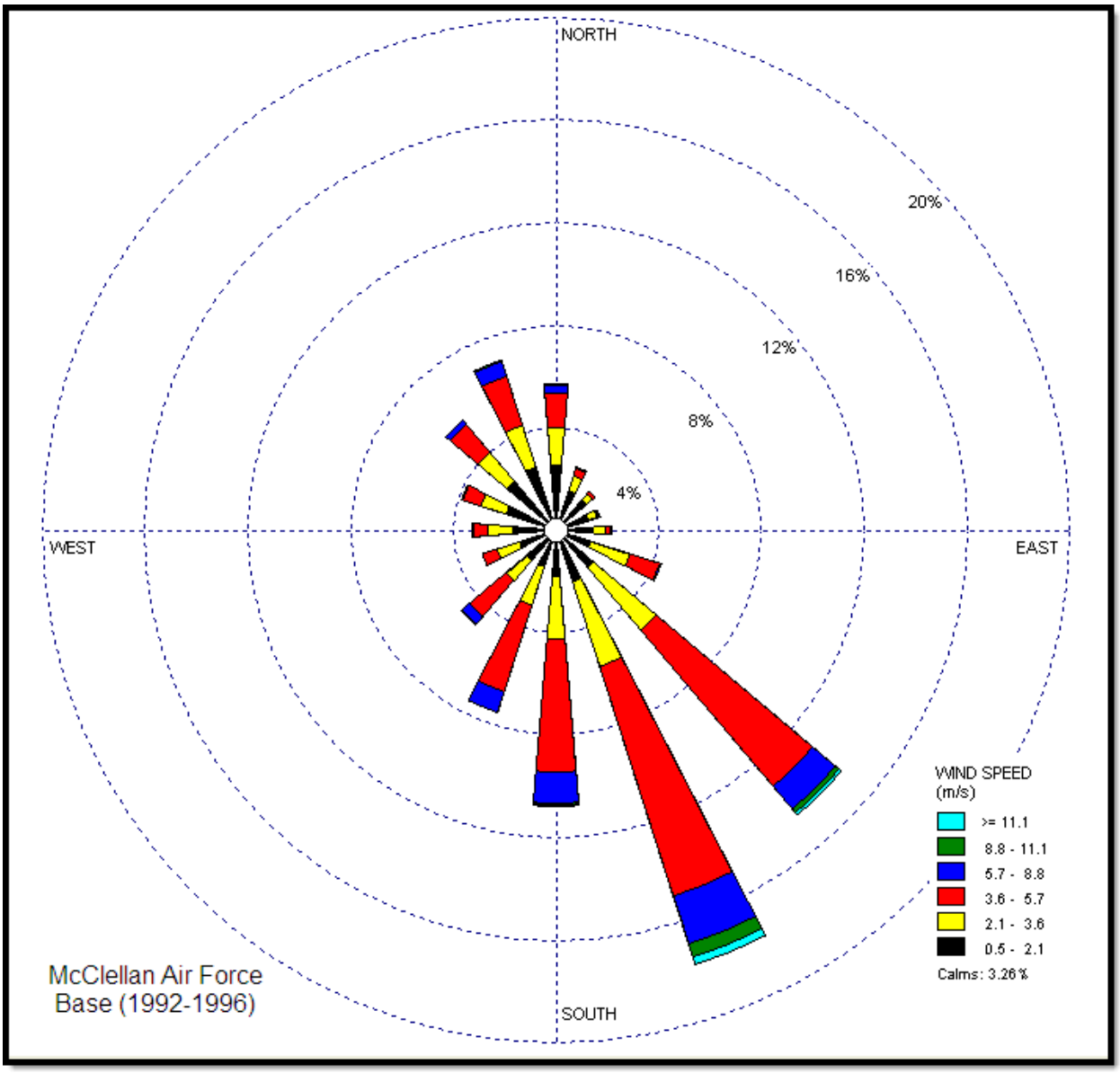

Figure 3. Wind Rose for the SVSP Area

Figure 5 shows that several proposed school sites would be located near major arterials. ARB has developed recommendations against siting new sensitive land uses, such as schools, within 500 feet of freeways or arterials that have more than 100,000 AADT per day (California Air

Resources Board, 2005). AADT on SRVP arterials would be substantially less than 100,000 through 2035. Consequently, the location of schools near arterials does not pose a substantial health risk for any of the SRVP proposed schools.

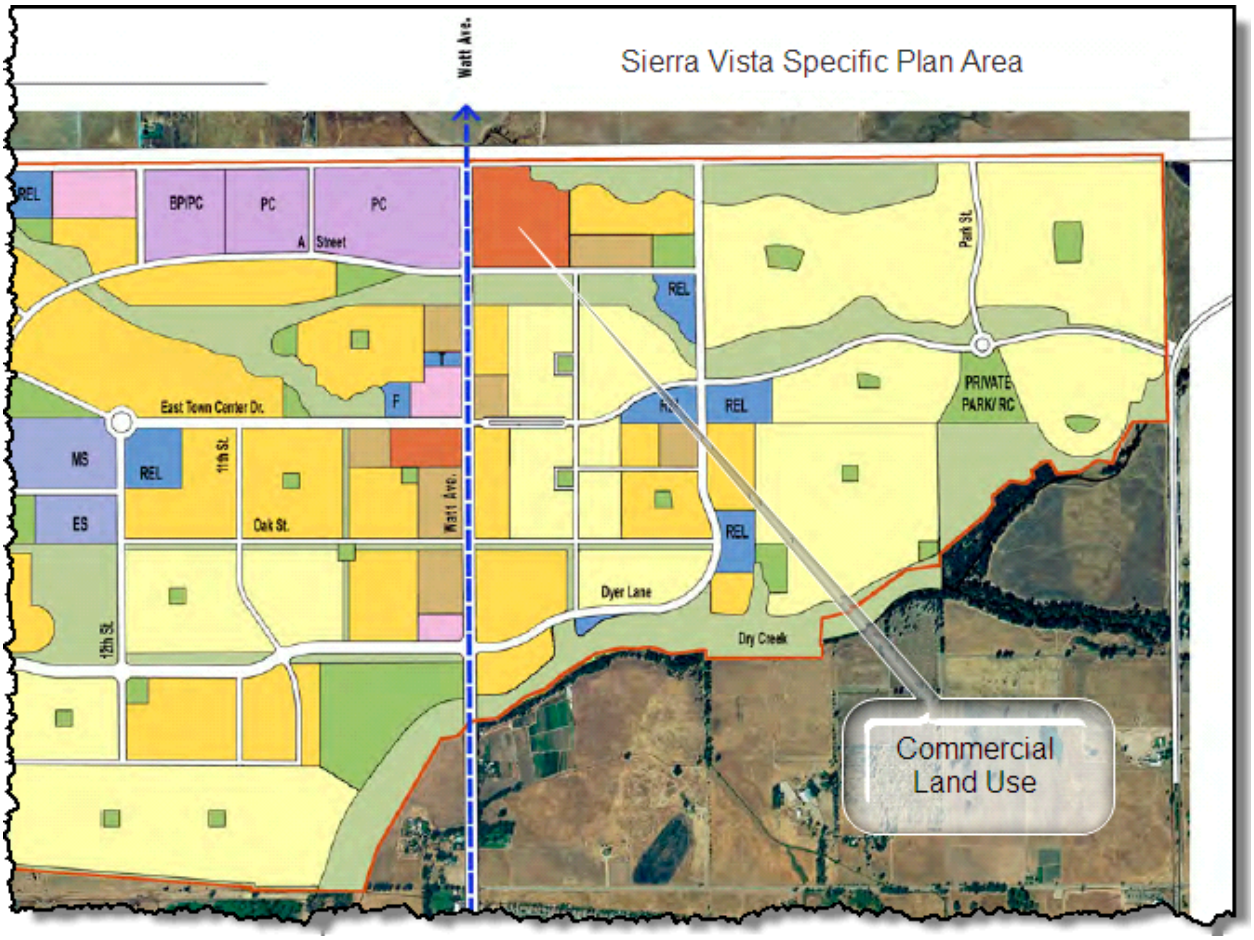

Figure 4. Commercial Land Use Designation within Placer Vineyards Located Upwind from SVSP

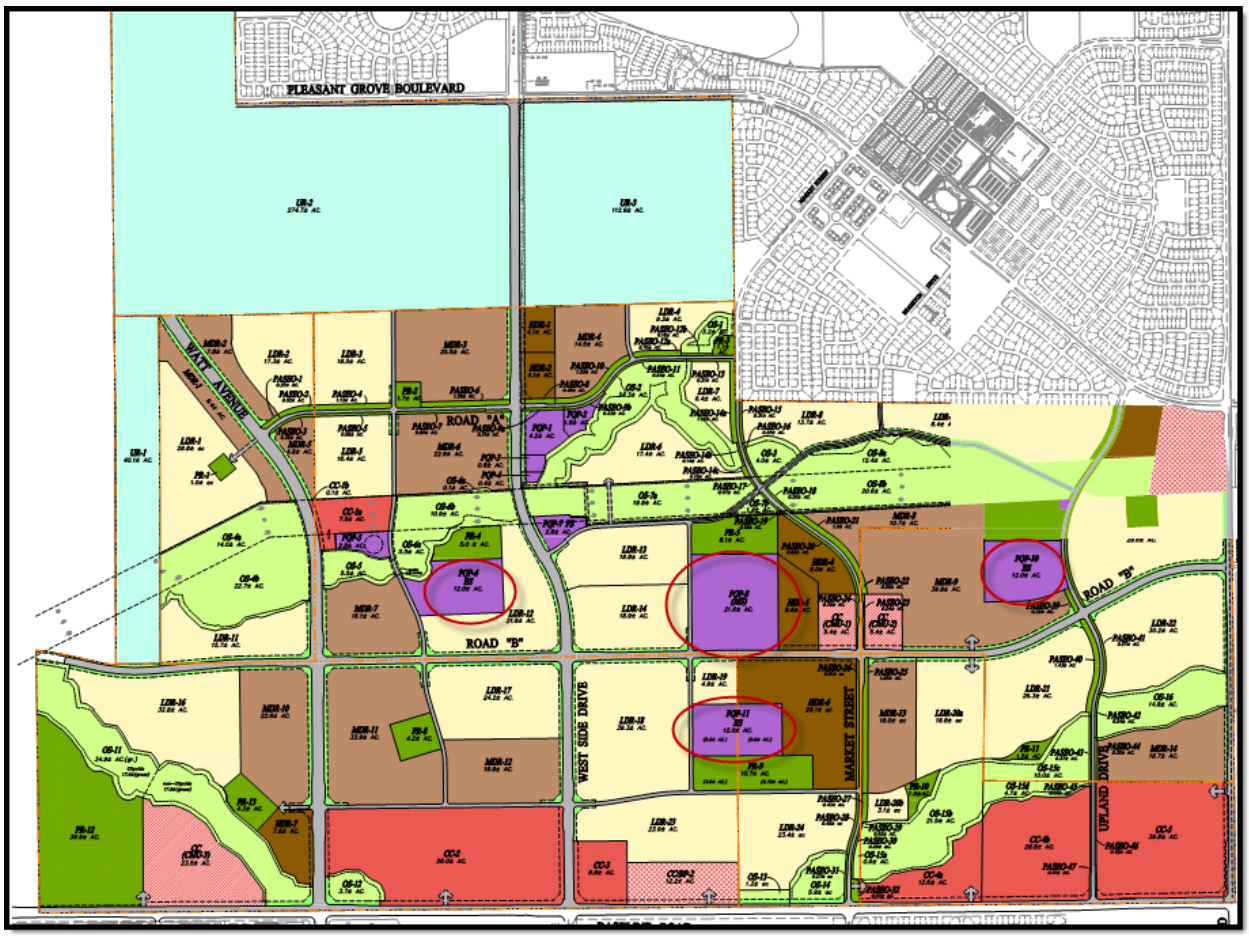

Figure 5. Location of SRVP Elementary Schools and Middle School with Respect to Major Arterials

Odors

Land use conflicts could generate objectionable odors. For the proposed project, objectionable odors typically occur when a land use with sensitive receptors is located in close proximity and downwind from an odor source, or when an odor sources is located upwind of a sensitive receptor. Examples of sensitive receptors include land uses that include residences, hospitals, schools, and daycare centers. Odor sources typically include wastewater treatment plants, rendering plants, landfills, and large industrial facilities.

There are currently few sensitive receptors present within the immediate project vicinity that would have the potential to be exposed to objectionable odors emitted during project construction. As the proposed

project moves forward in building out, sensitive receptors would begin to locate on the project site, including elementary schools, a middle school, and residences. These new sensitive receptors may potentially be exposed to objectionable odors emitted during project construction. Potential sources that may emit odors during construction activities include the use of architectural coatings and solvents. However, these would be short-term, minor odor impacts.

Land uses and industrial operations associated with odor complaints include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. The project site is currently used for agricultural and grazing purposes. Odors from these existing activities would be eliminated by buildout of the SRVP. The proposed project is located near Placer Vineyards, which may emit odors that could affect sensitive receptors within the project area. Placer Vineyards

The Placer Vineyards may potentially emit adverse odors which could affect residences and other sensitive receptors onsite. Wind blowing towards the northwest from Placer Vineyards toward the SVSP could potentially transport objectionable odors from the vineyard into the SVSP area. The primary source of odors would be the commercially zoned area as listed in Figure 4. This is a potentially significant impact.

Mitigation Measure AQ-3. Prior to approving construction of residences in the southern portion of the SVSP, an odor evaluation shall be conducted if the approval occurs subsequent to approval of the commercial area within the Placer Vineyard area and that commercial area allows for industrial land uses. If that analysis shows potential odor effects, then steps should be taken to eliminate the potential odor impact.

Greenhouse Gas Emissions

The Placer County General Plan currently designates most of the project site as agriculture/timberland. The majority of the project site is undeveloped and has historically been used for agricultural or grazing activities. There are four large-lot single-family residences in the central and southwestern portion of the project site, and other smaller structures along Baseline Road associated with ongoing dry farming agricultural production activities. Since the area is largely undeveloped, the existing GHG emissions on the project site are negligible.

Table 11 shows GHG emissions at full buildout of the proposed SVSP project in 2025 and for cumulative buildout in 2035. Transportation represents the largest percentage of SVSP GHG emissions, followed by electricity use and area sources.

Table 11. Operational GHG Emissions for Specific Plan Buildout and Cumulative Buildout (unmitigated, metric tons per year)

Buildout (2025)	CO_2	CH_4	N_2O	CO_2e
Water	1,748	0.01	0.01	1,751
Wastewater	695	0.01	0.00	696
Solid Waste	-	136.8	-	2,873
Area Sources	45,516	-	-	45,516
Electricity	65,845	0.6	0.3	65,965
Transportation	304,058	-	-	320,061
Total	417,862	137.4	0.3	436,863

Cumulative (2035)	CO_2	CH_4	N_2O	CO_2e
Water	3,155	0.03	0.01	3,161
Wastewater	2,310	0.02	0.01	2,314
Solid Waste	-	205.5	-	4,315
Area Sources	60,617	-	-	60,617
Electricity	74,304	0.6	0.3	74,439
Transportation	374,528	-	-	393,255
Total	514,913.45	206.18	0.37	538,098.30

Notes: Transportation emissions based on URBEMIS20007 estimates using EMFAC2007 emission rates. Area source emissions estimated using the URBEMIS2007 model using the proposed land uses proposed for the SVSP. Direct electricity and indirect (water-related) electricity estimates based on land uses proposed for buildout. Electricity estimates based on emission factors developed by the California Climate Action Registry (2009). The emission estimation methodology is described in Appendix A and the calculations and modeling results are shown in Appendix B.

Alternative 1 – Increased Avoidance, Increased Density

Table 12 shows GHG emissions at full buildout of Alternative 1 in 2025 and for cumulative buildout in 2035. GHG emissions associated with Alternative 1 would be slightly lower than those for the preferred SVSP because of the lower vehicle miles traveled and the higher ratio of higher density residential development as compared to the preferred alternative.

Table 12. Operational GHG Emissions for Alternative 1 Buildout and Alternative 1 Cumulative Buildout (unmitigated, metric tons per year)

Buildout (2025)	CO_2	CH_4	N_2O	CO_2e
Water	1,749.90	0.01	0.01	1,753.22
Wastewater	695.54	0.01	0.00	695.75
Solid Waste	-	136.96	-	2,876.20
Area Sources	27,330.33	-	-	27,330.33
Electricity	65,924.15	0.64	0.31	66,033.69
Transportation	248,180.00	-	-	260,589.00
Total	343,879.92	137.62	0.32	359,278.19

Cumulative (2035)	CO_2	CH_4	N_2O	CO_2e
Water	3,156.90	0.03	0.01	3,160.64
Wastewater	2,311.14	0.02	0.01	2,313.42
Solid Waste	0.00	205.66	0.00	4,318.90
Area Sources	42,430.51	0.00	0.00	42,430.51
Electricity	74,382.79	0.63	0.35	74,518.48
Transportation	318,649.89	0.00	0.00	334,582.38
Total	440,931.23	206.34	0.36	461,324.33

Notes: Transportation emissions based on URBEMIS20007 estimates using EMFAC2007 emission rates. Area source emissions estimated using the URBEMIS2007 model using the proposed land uses proposed for Alternative 1. Direct electricity and indirect (water-related) electricity estimates based on land uses proposed for buildout of Alternative 1. Electricity estimates based on emission factors developed by the California Climate Action Registry (2009). The emission estimation methodology is described in Appendix A and the modeling results in Appendix B.

Alternative 2 – Increased Avoidance, Same Density

Table 13 shows GHG emissions at full buildout of Alternative 2 in 2025 and for cumulative buildout in 2035. GHG emissions associated with Alternative 2 would be lower than those for the preferred SVSP because of the lower vehicle miles traveled and the lower number of residences as compared to the preferred alternative.

Table 13. Operational GHG Emissions for Alternative 2 Buildout and Alternative 2 Cumulative Buildout (unmitigated, metric tons per year)

Buildout (2025)	CO2	CH_4	N_2O	CO_2e
Water	1,294.50	0.01	0.01	1,296.95
Wastewater	514.53	0.01	0.00	514.68
Solid Waste	-	101.32	-	2,127.69
Area Sources	24,852.21	-	-	24,852.21
Electricity	48,767.84	0.44	0.23	48,848.35
Transportation	225,911.09	-	-	237,206.65
Total	301,340.18	101.78	0.24	314,846.54

Cumulative (2035)	CO2	CH_4	N_2O	CO_2e
Water	2,701.50	0.03	0.01	2,704.37
Wastewater	2,130.13	0.02	0.01	2,132.35
Solid Waste	0.00	170.02	0.00	3,570.39
Area Sources	39,952.39	0.00	0.00	39,952.39
Electricity	57,226.48	0.43	0.27	57,333.14
Transportation	296,380.98	0.00	0.00	311,200.03
Total	398,391.48	170.49	0.28	416,892.68

Notes: Transportation emissions based on URBEMIS20007 estimates using EMFAC2007 emission rates. Area source emissions estimated using the URBEMIS2007 model using the proposed land uses proposed for Alternative 2. Direct electricity and indirect (water-related) electricity estimates based on land uses proposed for buildout of Alternative 2. Electricity estimates based on emission factors developed by the California Climate Action Registry (2009). The emission estimation methodology is described in Appendix A and the modeling results in Appendix B.

Alternative 3 – Same Footprint, Reduced Density

Table 14 shows GHG emissions at full buildout of Alternative 3 in 2025 and for cumulative buildout in 2035. GHG emissions associated with Alternative 3 would be lower than those for the preferred SVSP because of the lower vehicle miles traveled and the lower number residences as compared to the preferred alternative.

Alternative 4 – No Project

GHG emissions associated with Alternative 4 would be negligible because no development would occur under this alternative.

Table 14. Operational GHG Emissions for Alternative 3 Buildout and Alternative 3 Cumulative Buildout (unmitigated, metric tons per year)

Buildout (2025)	CO_2	CH_4	N_2O	CO_2e
Water	1,309.47	0.01	0.01	1,311.95
Wastewater	520.48	0.01	0.00	520.63
Solid Waste	-	102.49	-	2,152.30
Area Sources	31,841.96	-	-	31,841.96
Electricity	49,331.81	0.45	0.23	49,413.25
Transportation	276,337.99	-	-	290,154.89
Total	359,341.70	102.95	0.24	375,394.98

Cumulative (2035)	CO_2	CH_4	N_2O	CO_2e
Water	2,716.47	0.03	0.01	2,719.37
Wastewater	2,136.08	0.02	0.01	2,138.30
Solid Waste	0.00	171.19	0.00	3,595.00
Area Sources	46,942.14	0.00	0.00	46,942.14
Electricity	57,790.44	0.44	0.27	57,898.04
Transportation	346,807.88	0.00	0.00	364,148.27
Total	456,393.01	171.67	0.28	477,441.12

Notes: Transportation emissions based on URBEMIS20007 estimates using EMFAC2007 emission rates. Area source emissions estimated using the URBEMIS2007 model using the proposed land uses proposed for Alternative 3. Direct electricity and indirect (water-related) electricity estimates based on land uses proposed for buildout of Alternative 3. Electricity estimates based on emission factors developed by the California Climate Action Registry (2009). The emission estimation methodology is described in Appendix A and the modeling results in Appendix B.

The following measures will reduce emissions of GHG.

Mitigation Measure GHG - 1. Prioritized parking within new commercial and retail areas shall be given to electric vehicles, hybrid vehicles, and alternative fuel vehicles.

Mitigation Measure GHG - 2. SVSP shall require that new or major rehabilitation projects (additions of 25,000 square feet of office/retail commercial or 100,000 square feet of industrial floor area) and residential projects of six or more units comply with at least one of the following:

Participate in the CEC's New Solar Homes Partnership (this program provides rebates to developers of 6 units or more who offer solar power in 50 percent of new units), or a similar program with solar power requirements equal to or greater than those of the CEC's New Solar Homes Partnership as demonstrated to the City by the project applicant.

Design and construct 50 percent of the square footage of the building(s) to be capable of being certified under the Leadership in Energy and Environmental Design (LEED) or another building rating system that achieves a comparable level of GHG reduction such as the Build-it Green program:. However, no formal LEED or Build-It Green certification shall be required, and the City Manager or his/her designee shall make the determination that the potential for certification has been achieved. All credits used to demonstrate capability to meet one of the above certifications must directly or indirectly result in a reduction in GHG emissions.

Mitigation Measure GHG - 3. New development or major rehabilitation of commercial, office, or industrial development (additions of 25,000 square feet of office/retail commercial or 100,000 square feet of industrial floor area) must incorporate renewable energy generation (on- or off-site) to provide 15 percent or more of the project's energy needs.

Mitigation Measure GHG - 4. SVSP shall require that the design or purchase of any new street lights and water and wastewater pumps and treatment systems achieve a 10 percent reduction beyond an estimated baseline energy use for this infrastructure. All new traffic lights installed within SVSP shall use LED technology.

Mitigation Measure GHG - 5. SVSP shall require all new development or major rehabilitation (additions of 25,000 square feet of office/retail commercial or 100,000 square feet of industrial floor area) projects to recycle and/or salvage at least 50 percent of nonhazardous construction and demolition debris. To implement this requirement, a construction waste management plan identifying materials to be diverted from disposal and whether the materials will be stored on-site or commingled shall be developed and implemented by the applicant for said development or rehabilitation. Excavated soil and land-clearing debris do not contribute to

this credit. Calculation can be done by weight or volume but must be consistent throughout.

Mitigation Measure GHG - 6. SVSP shall require all new development and major rehabilitation (additions of 25,000 square feet of office/retail commercial or 100,000 square feet of industrial floor area) projects to incorporate any combination of the following strategies to reduce heat gain for 50 percent of the non-roof impervious site landscape (including roads, sidewalks, courtyards, parking lots, and driveways):

- Shaded (Within 5 years of occupancy)
- Paving materials with a Solar Reflective Index (SRI) of at least 29
- Open grid pavement system (pavement that is less than 50% impervious and contains vegetation in the open cells)
- Parking spaces under cover (defined as underground, under deck, under roof, or under building.) Any roof used to shade or cover parking must have an SRI of at least 29.

Mitigation Measure GHG - 7. SVSP shall require that all new development and major rehabilitation (additions of 25,000 square feet of office/retail commercial or 100,000 square feet of industrial floor area) projects incorporate "green building" points in construction plans prior to issuing a permit to build. Such points may be achieved through checklists identified by New Home Construction Green Building Guidelines available at www.builditgreen.org, or through a similar list that distinguishes specific measures targeting efficiencies in energy, resource use, or other measures that would also directly or indirectly result in GHG emission reductions. Specific efficiencies that would reduce GHG emissions shall be implemented where feasible for all project areas including site design, landscaping, foundation, structural frame and building envelope, exterior finishing, plumbing, appliance use, insulation, heating, venting and air conditioning, building performance, use of renewable energy, finishes, and flooring.

Implementation of the mitigation measures described above would reduce emissions from the SVSP to the levels shown in Table 15. The mitigated emission estimates shown in Table 15 assume a 10% emission reduction associated with implementation of the California Air Resources Board's Low Carbon Fuels Standard and a 20% emission electricity related emission reduction associated with California's Renewable Portfolio Standard and the mitigation measures described above.

Table 15. Operational GHG Emissions for Specific Plan Buildout and Cumulative Buildout (mitigated, metric tons per year)

Buildout (2025)	CO_2	CH_4	N_2O	CO_2e
Water	1,398.20	0.01	0.01	1,400.85
Wastewater	555.80	0.01	0.00	556.25
Solid Waste	-	136.80	-	2,872.80
Area Sources	45,516.41	-	-	45,516.41
Electricity	52,676.00	0.5	0.3	52,779.50
Transportation	273,652.42	-	-	288,055.17
Total	373,798.83	137.32	0.31	391,180.98
Cumulative (2035)				
Water	2,523.80	0.02	0.01	2,526.78
Wastewater	1,848.20	0.02	0.01	1,851.02
Solid Waste	-	205.50	-	4,315.50
Area Sources	60,616.59	-	-	60,616.59
Electricity	59,442.91	0.6	0.3	59,548.51
Transportation	337,075.31	-	-	354,816.12
Total	461,506.81	206.14	0.32	483,674.52

Notes: Transportation emissions based on URBEMIS estimates using EMFAC2007 emission factors. Estimates assume that 5% of transportation emissions are from CH_4, N_2O and HFCs (EPA 2005). Area source emissions estimated using the URBEMIS2007 model using the proposed land uses proposed for the SVSP. Direct electricity and indirect (water-related) electricity estimates based on land uses proposed for buildout. Electricity estimates based on emission factors developed by the California Climate Action Registry (2009).

Table 16 shows mitigated GHG emissions for buildout of Alternative 1 (2025) and for cumulative buildout (2035). The mitigated emissions shown for Alternative 1 assume the same level of mitigation as in the preferred SVSP.

Table 16. Operational GHG Emissions for Alternative 1 Buildout and Alternative 1 Cumulative Buildout (mitigated, metric tons per year)

Buildout (2025)	CO_2	CH_4	N_2O	CO_2e
Water	1,749.90	0.01	0.01	1,753.22
Wastewater	695.54	0.01	0.00	695.75
Solid Waste	-	136.96	-	2,876.20
Area Sources	27,330.33	-	-	27,330.33
Electricity	52,739.32	0.51	0.25	52,826.95
Transportation	223,362.00	-	-	234,530.10
Total	305,877.09	137.49	0.26	320,012.55

Cumulative (2035)	CO_2	CH_4	N_2O	CO_2e
Water	2,875.50	0.03	0.01	2,879.15
Wastewater	1,987.94	0.02	0.01	1,990.51
Solid Waste	0.00	205.66	0.00	4,318.90
Area Sources	42,430.51	0.00	0.00	42,430.51
Electricity	59,506.23	0.61	0.25	59,595.96
Transportation	286,784.90	0.00	0.00	301,291.05
Total	393,585.08	206.32	0.27	412,506.09

Notes: Transportation emissions based on URBEMIS estimates using EMFAC2007 emission factors. Estimates assume that 5% of transportation emissions are from CH_4, N_2O and HFCs (EPA 2005). Area source emissions estimated using the URBEMIS2007 model using the proposed land uses proposed for Alternative 1. Direct electricity and indirect (water-related) electricity estimates based on land uses proposed for buildout. Electricity estimates based on emission factors developed by the California Climate Action Registry (2009).

Table 17 shows mitigated GHG emissions for buildout of Alternative 2 (2025) and for cumulative buildout (2035). The mitigated emissions shown for Alternative 2 assume the same level of mitigation as in the preferred SVSP and Alternative 1.

Table 17. Operational GHG Emissions for Alternative 2 Buildout and Alternative 2 Cumulative Buildout (mitigated, metric tons per year)

Buildout (2025)	CO_2	CH_4	N_2O	CO_2e
Water	1,294.50	0.01	0.01	1,296.95
Wastewater	514.53	0.01	0.00	514.68
Solid Waste	-	101.32	-	2,127.69
Area Sources	24,852.21	-	-	24,852.21
Electricity	39,014.28	0.36	0.18	39,078.68
Transportation	203,319.98	-	-	213,485.98
Total	268,995.50	101.69	0.19	281,356.20

Cumulative (2035)	CO_2	CH_4	N_2O	CO_2e
Water	2,420.10	0.02	0.01	2,422.89
Wastewater	1,806.93	0.02	0.01	1,809.45
Solid Waste	0.00	170.02	0.00	3,570.39
Area Sources	39,952.39	0.00	0.00	39,952.39
Electricity	45,781.19	0.46	0.18	45,847.69
Transportation	266,742.88	0.00	0.00	280,246.93
Total	356,703.49	170.51	0.20	373,849.74

Notes: Transportation emissions based on URBEMIS estimates using EMFAC2007 emission factors. Estimates assume that 5% of transportation emissions are from CH_4, N_2O and HFCs (EPA 2005). Area source emissions estimated using the URBEMIS2007 model using the proposed land uses proposed for Alternative 2. Direct electricity and indirect (water-related) electricity estimates based on land uses proposed for buildout. Electricity estimates based on emission factors developed by the California Climate Action Registry (2009).

Table 18 shows mitigated GHG emissions for buildout of Alternative 3 (2025) and for cumulative buildout (2035). The mitigated emissions shown for Alternative 3 assume the same level of mitigation as in the preferred SVSP and for Alternatives 1 and 2.

Table 18. Operational GHG Emissions for Alternative 3 Buildout and Alternative 3 Cumulative Buildout (mitigated, metric tons per year)

Buildout (2025)	CO_2	CH_4	N_2O	CO_2e
Water	1,309.47	0.01	0.01	1,311.95
Wastewater	520.48	0.01	0.00	520.63
Solid Waste	-	102.49	-	2,152.30
Area Sources	31,841.96	-	-	31,841.96
Electricity	39,465.44	0.36	0.19	39,530.60
Transportation	248,704.19	-	-	261,139.40
Total	321,841.54	102.86	0.19	336,496.84

Cumulative (2035)	CO_2	CH_4	N_2O	CO_2e
Water	2,435.07	0.02	0.01	2,437.89
Wastewater	1,812.88	0.02	0.01	1,815.40
Solid Waste	0.00	171.19	0.00	3,595.00
Area Sources	46,942.14	0.00	0.00	46,942.14
Electricity	46,232.35	0.46	0.19	46,299.61
Transportation	312,127.09	0.00	0.00	327,900.35
Total	409,549.53	171.69	0.20	428,990.38

Notes: Transportation emissions based on URBEMIS estimates using EMFAC2007 emission factors. Estimates assume that 5% of transportation emissions are from CH_4, N_2O and HFCs (EPA 2005). Area source emissions estimated using the URBEMIS2007 model using the proposed land uses proposed for Alternative 3. Direct electricity and indirect (water-related) electricity estimates based on land uses proposed for buildout. Electricity estimates based on emission factors developed by the California Climate Action Registry (2009).

Currently, no California state agency has adopted an applicable plan, policy, or regulation that limits GHGs emissions for individual cities, general plans, or specific plan areas. However, the mitigation measures specified above are based on measures recommended by the California Attorney General (California Department of Justice, 2008) and by the California's Air Pollution Control Association (2008 and 2009).

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Appendix A. Estimation Methodologies

Table of Contents **Page Appendix A-**

Construction

The Sierra Vista Specific Plan (SVSP) is assumed to be built out by 2025 using the assumed construction schedule in Table A-1. URBEMIS2007 Version 9.2.4 was used to estimate emissions from each year of construction. Soil hauling was estimated to be 100 cubic yards on-site and 100 cubic yards off-site. The water storage tank, well sites, and electric substation were assumed to have a trip generation rate of 2.5 trips per day (DKS Associates, 2009). The recycle center, wastewater treatment facility, and solid waste recycling facility were assumed to have a trip generation rate of 4.96 trips per day, the Institute of Transportation Engineers' trip rate for warehouses. The fire station was estimated to have a trip generation rate of 3 trips per day (DKS Associates, 2009).

Table A-1: Assumed Construction Schedule for Sierra Vista Specific Plan

Year	Activity
Phase A	
2013	49.13 acres LDR, 12.57 acres MDR, 5.48 acres HDR, 1.08 acres Commercial Mixed Use housing, 1.6 acres commercial, 5.3 acres parks, 0.3 acre well site, 3.8 acres office space, 12 acres fire station
2014	49.13 acres LDR, 12.57 acres MDR, 5.48 acres HDR, 1.08 acres Commercial Mixed Use housing, 1.6 acres commercial, 5.3 acres parks, 12 acres elementary school, 3.8 acres office space
2015	49.13 acres LDR, 12.57 acres MDR, 5.48 acres HDR, 1.08 acres Commercial Mixed Use housing, 1.6 acres commercial, 5.3 acres

	parks, 12 acres middle school, 3.8 acres office space
2016	49.13 acres LDR, 12.57 acres MDR, 5.48 acres HDR, 1.08 acres Commercial Mixed Use housing, 1.6 acres commercial, 5.3 acres parks, 3.8 acres office space
Phase B	
2017	37.7 acres LDR, 11.46 acres MDR, 13.27 acres HDR, 4.2 acres park, 30 acres commercial space, 12 acres elementary school, 4.1 acres office space
2018	37.7 acres LDR, 11.46 acres MDR, 13.27 acres HDR, 4.2 acres park, 30 acres commercial space, 4.1 acres office space
2019	37.7 acres LDR, 11.46 acres MDR, 13.27 acres HDR, 4.2 acres park, 30 acres commercial space, 4.1 acres office space
Phase C	
2020	39.3 acres LDR, 28.36 acres MDR, 1.79 acres HDR, 2.32 acres Commercial Mixed Use housing, 13.6 acres park, 12 acres elementary school, 3.1 acres office space, 2.2 acres wastewater treatment facility, 0.3 acres solid waste recycling facility, 19.4 acres commercial space, 0.3 acre well site
2021	39.3 acres LDR, 28.36 acres MDR, 1.79 acres HDR, 2.32 acres Commercial Mixed Use housing, 13.6 acres park, 3.1 acres office space, 19.4 acres commercial space
2022	39.3 acres LDR, 28.36 acres MDR, 1.79 acres HDR, 2.32 acres Commercial Mixed Use housing, 13.6 acres park, 3.1 acres office space, 19.4 acres commercial space
2023	39.3 acres LDR, 28.36 acres MDR, 1.79 acres HDR, 2.32 acres Commercial Mixed Use housing, 13.6 acres park, 3.1 acres office space, 19.4 acres commercial space
Phase D	
2024	18.45 acres LDR, 62.83 acres MDR, 7.94 acres HDR, 1.7 acres parks, 1.8 acres water tank storage, 4.2 acres church, 0.8 acres electric substation, 0.4 acres recycle center

URBEMIS 2007 estimates the type of construction equipment used for each construction phase. Because a detailed schedule of construction activity was not available, this analysis assumes that the four phases of construction would be spread over a 13-year period beginning in January 2013 and completed by December 2004.

According to the URBEMIS 2007 model set-up, construction of any project is generally broken down into four phases: grading, paving, building construction, and architectural coating. It was assumed that grading, paving, building construction, and architectural coating would occur during each year of project construction. Table A-2 shows the construction equipment assumed for each phase of project construction.

All URBEMIS2007 mitigation was turned on for construction related activities. Emission estimates after mitigation are included in the main report.

Table A-2. Anticipated Construction Equipment

Equipment Pieces by Phase	Number of Equipment Pieces Used	Horsepower	Hours per Day
Site grading			
Excavator	1	168	8
Grader	1	174	8
Rubber tired dozer	1	357	8
Tractor/loader/backhoe	3	108	8
Scraper	2	313	8
Water truck	1	189	8
Paving			
Paving Equipment	2	104	8
Pavers	1	100	8
Rollers	2	95	6
Building Construction			
Forklift	3	145	8
Generator Sets	1	49	8
Crane	1	399	7
Welders	1	45	8
Tractor/loader/backhoe	3	108	7

Operation

Two types of air pollutant sources are expected during operation of the proposed project: area and mobile sources. The primary operational emissions associated with the project are ozone precursors, CO, PM10, PM2.5, and CO_2. These emissions were evaluated using the URBEMIS2007 model for each year of project construction and operation (2013-2025), while the effects of CO "hot spot" emissions were evaluated through CO dispersion modeling for existing year and cumulative year with and without project conditions. The effects of operation-related CO emissions were evaluated using the CALINE4 dispersion model. This analysis used meteorological conditions most conducive to high CO concentrations in the SVAB. CO emission factors generated by ARB's EMFAC2007 emission factor model were used as inputs to the CALINE4 model. The meteorological conditions assumed for the modeling included a worst-case wind speed of 0.5 meter per second, "F" atmospheric stability, worst-case wind angle search, and a sigma theta (wind fluctuation) of 15 degrees.

To be conservative, receptors were placed near the edge of the roadway, regardless of the land use. The traffic volumes were based on the average daily volumes included in the draft traffic report (DKS Associates, 2009). Emission factors for all road links were based on the 1 mile-per-hour emission rates generated for 2035 using the EMFAC2007 model.

Background CO concentrations were added to the 1-hour concentrations estimated using CALINE4. One-hour concentrations were multiplied by a persistence factor of 0.6 to estimate 8-hour concentrations. A background 8-hour CO concentration was then added to the estimated 8-hour concentration to determine the maximum 8-hour concentration. The background 1-hour and 8-hour concentrations were based on the maximum CO values, 5.73 ppm, and 2.06 ppm respectively (EPA 2008).

Greenhouse Gas Emissions

CO_2 emissions for construction and operation of the proposed project were estimated using the URBEMIS2007 model. For operational emissions, URBEMIS2007 only estimates area source and on-road emissions. Electricity-related emissions and emissions associated with solid waste were estimated separately as

described below. Greenhouse gas emissions were estimated for full buildout of the project in 2025 and cumulative buildout in 2035.

Electricity

For the 2025 buildout, CapitolUtility 2009 estimated electricity demand to be 24MVA (CapitolUtility Services 2009). For the purposes of this analysis, 1VA was assumed to be equal to 1 Watt. California Climate Action Registry electricity emission factors for CH_4 and N_2O were used to estimate emissions associated with electricity use in 2025 and 2035 (California Climate Action Registry 2009). Roseville Electric's reported 2007 CO_2 emissions factor was used to estimate CO_2 emissions from electricity (Roseville Electric, 2007).

Cumulative buildout in 2035 includes the construction of 3,340 additional homes. The California Energy Commission's "Residential Appliance Saturation Survey" was used to estimate average electricity demand of a new home in California, which is 7,035 kWh per year (Itron 2004).

California's Renewable Portfolio Standard will require that 33% of electricity generation be from renewable energy sources. Assuming Roseville Electric complies with the RPS Standard and the project implements the recommended mitigation, emissions associated with electricity use should be reduced by about 20%. Mitigated emissions for the 2025 buildout and 2035 cumulative buildout include this 20% reduction in emissions associated with electricity use. Unmitigated emissions do not include emissions reductions associated with the California RPS standard.

Area Sources

Area source examples include lawnmowers and other landscape maintenance equipment, natural gas fired water and space heaters, and consumer products such as paints, hairspray, deodorant, and similar products with evaporative emissions. Area sources of CO_2 were estimated using the URBEMIS2007 model for 2025 buildout and 2035 cumulative buildout. CH_4 and N_2O emissions were not estimated for area sources.

Transportation

Mobile sources refer to emissions from motor vehicles, including tailpipe, evaporative, and fugitive emissions. URBEMIS2007 was used to estimate emissions from project traffic in 2025 and 2035. The EPA recommends assuming that CH_4, N_2O, and HFC emissions account for 5% of on-road GHG emissions, accounting for their GWPs (Environmental Protection Agency 2005). The annual CO_2 emissions from transportation were divided by 0.95 to account for emissions of CH_4, N_2O, and HFCs.

For mitigation in 2025 and 2035, a 10% decrease in traffic emissions was assumed to occur because of the Low Carbon Fuel Standard.

Water/Wastewater

The proposed project predicts a demand of 5,500 acre-feet of water and 2,712 acre-feet of recycled water per year. Electricity consumption is embedded in the supply, treatment, distribution, wastewater treatment and water reclamation. Table A-3 lists the embedded electricity in the supply, treatment and distribution of water, wastewater treatment and water reclamation (Pacific Institute 2005).

Table A-3. Water/Wastewater Embedded Electricity

	Electricity	Units
Water Supply	238	kWh/acre-foot
Water Treatment	55	kWh/acre-foot
Water Distribution	395	kWh/acre-foot
Wastewater Treatment	440	kWh/acre-foot
Water Reclamation (Recycled water)	350	kWh/acre-foot

Source: Pacific Institute, 2005.

Water demand estimates for 2035 were based on the average of estimated annual water use for households in 3 cities in California (Demand Response Research Center 2007). The average household water use was multiplied by the 3,340 additional homes projected to be built in the cumulative scenario. Embedded electricity was calculated using the assumptions in Table A-3 and the emission factors for electricity described above.

After mitigation, the emissions associated with the embedded electricity in water use were reduced by 20% for the 2025 and 2035 cumulative scenarios.

Solid Waste

Emissions from solid waste generated by the SVSP in 2025 and the 2035 cumulative scenario were based on California Air Resources Board estimates of CH_4 emissions per capita per standard cubic foot of landfill gas and predicted populations in 2025 and 2035. The 2025 buildout population was based on 2.54 persons per household, as indicated in the project description, and estimated to be 16,904 people. The 2035 population estimate based on the same criteria, is estimated to be 25,387. The 2006 California population (37,086,191) and the estimated emissions of landfill gas in California in 2006 were used to obtain a per capita estimate of landfill gas emissions (California Department of Finance 2009; California Air Resources Board 2009). The projected project area population was multiplied by this per capita emissions estimate to obtain landfill gas methane emissions. Emissions of N_2O and CO_2 were ignored for the purposes of this analysis.

Alternative 1, 2, and 3 GHG Emissions

Greenhouse gas emissions were estimated directly for the 2025 preferred project and 2035 build out of the preferred alternative. For Alternatives 1, 2, and 3, GHG emissions were estimated by scaling up the 2025 preferred GHG emission estimates.

All numbers were adjusted by assuming that there would be 2.54 persons per dwelling unit and the number of dwelling units for each alternative was based on information in the project description. Therefore, all greenhouse gas emissions are based on the original preferred alternative GHG emissions for 2025 and adjusted on a per capita or per housing unit basis.

Appendix B. Modeling Results

Table of Contents **Page Appendix B-**

Construction

2013 Construction Emissions

9/21/2009 10:57:37 AM

Urbemis 2007 Version 9.2.4

Summary Report for Summer Emissions (Pounds/Day)

File Name: C:\Projects\Roseville Sierra Vista Specific Plan\Subconsultant\Construction 2013.urb924

Project Name: 2013 Phase A

Project Location: Placer County APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5
2013 TOTALS (lbs/day unmitigated)	963.82	83.96	109.85	0.17	483.25	4.54	487.79	100.93	4.17	105.10
2013 TOTALS (lbs/day mitigated)	868.17	79.88	109.85	0.17	109.62	3.36	112.97	22.90	3.09	25.99

2014 Construction Emissions

9/21/2009 10:59:26 AM

Urbemis 2007 Version 9.2.4

Summary Report for Summer Emissions (Pounds/Day)

File Name: C:\Projects\Roseville Sierra Vista Specific Plan\Subconsultant\Construction 2014.urb924

Project Name: 2014 Phase A

Project Location: Placer County APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5
2014 TOTALS (lbs/day unmitigated)	1,177.24	77.89	103.78	0.15	481.85	4.14	485.99	100.64	3.80	104.44
2014 TOTALS (lbs/day mitigated)	1,060.14	74.02	103.78	0.15	109.30	3.03	112.33	22.83	2.78	25.62

2015 Construction Emissions

9/22/2009 10:22:02 AM

Urbemis 2007 Version 9.2.4

Summary Report for Summer Emissions (Pounds/Day)

File Name: C:\Projects\Roseville Sierra Vista Specific Plan\Subconsultant\Roseville SVSP Construction Emission Files\Construction 2015.urb924

Project Name: 2015 Phase A

Project Location: Placer County APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5
2015 TOTALS (lbs/day unmitigated)	981.48	54.93	94.56	0.15	481.81	2.56	484.37	100.62	2.35	102.97
2015 TOTALS (lbs/day mitigated)	883.89	54.93	94.56	0.15	109.26	2.56	111.82	22.82	2.35	25.17

2016 Construction Emissions

9/21/2009 11:01:43 AM

Urbemis 2007 Version 9.2.4

Summary Report for Summer Emissions (Pounds/Day)

File Name: C:\Projects\Roseville Sierra Vista Specific Plan\Subconsultant\Construction 2016.urb924

Project Name: 2016 Phase A

Project Location: Placer County APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5
2016 TOTALS (lbs/day unmitigated)	688.17	64.94	65.75	0.11	421.84	3.41	425.25	88.10	3.14	91.24
2016 TOTALS (lbs/day mitigated)	619.79	61.54	65.75	0.11	95.69	2.47	98.16	19.99	2.27	22.26

2017 Construction Emissions

9/21/2009 11:02:27 AM

Urbemis 2007 Version 9.2.4

Summary Report for Summer Emissions (Pounds/Day)

File Name: C:\Projects\Roseville Sierra Vista Specific Plan\Subconsultant\Construction 2017.urb924

Project Name: 2017 Phase B

Project Location: Placer County APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5
2017 TOTALS (lbs/day unmitigated)	1,784.73	56.43	133.79	0.26	734.21	2.48	736.69	153.34	2.28	155.61
2017 TOTALS (lbs/day mitigated)	1,606.90	56.43	133.79	0.26	166.49	2.48	168.97	34.77	2.28	37.05

2018 Construction Emissions

Page: 1
9/21/2009 11:03:07 AM

Urbemis 2007 Version 9.2.4

Summary Report for Summer Emissions (Pounds/Day)

File Name: C:\Projects\Roseville Sierra Vista Specific Plan\Subconsultant\Construction 2018.urb924

Project Name: 2018 Phase B

Project Location: Placer County APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5
2018 TOTALS (lbs/day unmitigated)	1,464.31	42.08	105.28	0.22	674.81	1.85	676.66	140.93	1.70	142.63
2018 TOTALS (lbs/day mitigated)	1,318.40	42.08	105.28	0.22	153.02	1.85	154.87	31.96	1.70	33.66

2019 Construction Emissions

9/21/2009 11:03:48 AM

Urbemis 2007 Version 9.2.4

Summary Report for Summer Emissions (Pounds/Day)

File Name: C:\Projects\Roseville Sierra Vista Specific Plan\Subconsultant\Construction 2019.urb924

Project Name: 2019 Phase B

Project Location: Placer County APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5
2019 TOTALS (lbs/day unmitigated)	1,707.12	38.38	99.65	0.22	674.81	1.63	676.44	140.93	1.50	142.43
2019 TOTALS (lbs/day mitigated)	1,536.88	38.38	99.65	0.22	153.02	1.63	154.66	31.96	1.50	33.46

2020 Construction Emissions

9/21/2009 11:04:25 AM

Urbemis 2007 Version 9.2.4

Summary Report for Summer Emissions (Pounds/Day)

File Name: C:\Projects\Roseville Sierra Vista Specific Plan\Subconsultant\Construction 2020.urb924

Project Name: 2020 Phase C

Project Location: Placer County APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5
2020 TOTALS (lbs/day unmitigated)	1,486.11	56.38	101.33	0.24	687.67	2.65	690.32	143.62	2.44	146.06
2020 TOTALS (lbs/day mitigated)	1,337.96	53.46	101.33	0.24	155.98	1.90	157.88	32.58	1.74	34.33

2021 Construction Emissions

9/21/2009 11:05:07 AM

Urbemis 2007 Version 9.2.4

Summary Report for Summer Emissions (Pounds/Day)

File Name: C:\Projects\Roseville Sierra Vista Specific Plan\Subconsultant\Construction 2021.urb924

Project Name: 2021 Phase C

Project Location: Placer County APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5
2021 TOTALS (lbs/day unmitigated)	1,131.90	46.88	67.93	0.19	555.25	2.32	557.57	115.97	2.13	118.10
2021 TOTALS (lbs/day mitigated)	1,019.03	43.96	67.93	0.19	125.94	1.56	127.50	26.31	1.44	27.74

2022 Construction Emissions

9/22/2009 10:24:18 AM

Urbemis 2007 Version 9.2.4

Summary Report for Summer Emissions (Pounds/Day)

File Name: C:\Projects\Roseville Sierra Vista Specific Plan\Subconsultant\Roseville SVSP Construction Emission Files\Construction 2022.urb924

Project Name: 2022 Phase C

Project Location: Placer County APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	
2022 TOTALS (lbs/day unmitigated)	1,165.10	34.95	61.16	0.19	555.21	1.45	556.66	115.95	1.33	117.28	21,5
2022 TOTALS (lbs/day mitigated)	1,048.91	34.95	61.16	0.19	125.90	1.45	127.35	26.30	1.33	27.63	21,5

2023 Construction Emissions

9/22/2009 10:26:26 AM

Urbemis 2007 Version 9.2.4

Summary Report for Summer Emissions (Pounds/Day)

File Name: C:\Projects\Roseville Sierra Vista Specific Plan\Subconsultant\Roseville SVSP Construction Emission Files\Construction 2023.urb924

Project Name: 2023 Phase C

Project Location: Placer County APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5
2023 TOTALS (lbs/day unmitigated)	1,200.32	46.85	61.28	0.19	555.25	2.32	557.57	115.97	2.13	118.10
2023 TOTALS (lbs/day mitigated)	1,080.60	43.92	61.28	0.19	125.94	1.56	127.50	26.31	1.43	27.74

2024 Construction Emissions

9/21/2009 11:07:25 AM

Urbemis 2007 Version 9.2.4

Summary Report for Summer Emissions (Pounds/Day)

File Name: C:\Projects\Roseville Sierra Vista Specific Plan\Subconsultant\Construction 2024.urb924

Project Name: 2024 Phase D

Project Location: Placer County APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5
2024 TOTALS (lbs/day unmitigated)	1,134.06	46.80	69.84	0.20	597.65	2.32	599.97	124.82	2.13	126.95
2024 TOTALS (lbs/day mitigated)	1,021.00	43.88	69.84	0.20	135.56	1.56	137.11	28.32	1.43	29.75

Operational Criteria Pollutants

Operational Specific Plan Buildout 2025

Page: 1
9/22/2009
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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Projects\Roseville Sierra Vista Specific Plan\Subconsultant\Roseville SVSP Operational Criteria Pollutant Files\2025 Operational.urb924
Project Name: 2025 Operational

Project Location: Placer County APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	492.29	170.55	245.73	0.01	0.67	0.67	207,830.51

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	1,093.24	823.39	9,334.38	18.68	3,224.31	613.50	1,920,726.28

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2

TOTALS (lbs/day, unmitigated)	1,585.53	993.94	9,580.11	18.69	3,224.98	614.17	2,128,556.79

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	12.56	169.04	116.20	0.00	0.31	0.31	207,617.94
Hearth - No Summer Emissions							
Landscape	21.22	1.51	129.53	0.01	0.36	0.36	212.57
Consumer Products	325.58						
Architectural Coatings	132.93						
TOTALS (lbs/day, unmitigated)	492.29	170.55	245.73	0.01	0.67	0.67	207,830.51

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	87.80	67.73	798.48	1.63	279.58	53.16	166,557.67
Apartments low rise	85.37	65.85	776.34	1.58	271.83	51.69	161,940.64
Apartments mid rise	45.17	33.05	389.62	0.79	136.42	25.94	81,272.76
Apartments high rise	7.05	5.16	60.84	0.12	21.30	4.05	12,691.09
Elementary school	69.40	51.09	582.63	1.17	201.58	38.35	120,079.36
Junior high school	22.86	17.21	196.08	0.40	68.65	13.05	40,811.99

Place of worship	5.46	3.89	43.35	0.09	15.45	2.94	9,146.55
City park	1.01	0.48	5.38	0.01	1.93	0.37	1,142.27
Supermarket	659.22	489.20	5,432.78	10.76	1,859.60	353.99	1,108,102.44
Office park	109.64	89.57	1,047.03	2.13	367.29	69.83	218,578.26
Well SIte/Electric Substation	0.02	0.01	0.11	0.00	0.04	0.01	24.17
Fire Station	0.17	0.10	1.14	0.00	0.42	0.08	248.65
Water Tank Storage	0.02	0.01	0.14	0.00	0.05	0.01	31.08
Wastewater Treatment	0.04	0.03	0.35	0.00	0.13	0.02	75.37
Solid Waste Recycling/ Recycle Center	0.01	0.01	0.11	0.00	0.04	0.01	23.98
TOTALS (lbs/day, unmitigated)	1,093.24	823.39	9,334.38	18.68	3,224.31	613.50	1,920,726.28

Operational Settings:

Includes correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2025 Temperature (F): 85 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	484.60	9.00	dwelling units	2,417.00	21,753.00	162,826.91
Apartments low rise	261.60	9.00	dwelling units	2,350.00	21,150.00	158,313.30
Apartments mid rise	66.10	6.50	dwelling units	1,633.00	10,614.50	79,452.32
Apartments high rise	34.30	6.50	dwelling units	255.00	1,657.50	12,406.82
Elementary school		14.49	1000 sq ft	1,568.16	22,722.64	117,383.33

Junior high school	13.78	1000 sq ft	522.72	7,203.08	39,984.52
Place of worship	9.30	1000 sq ft	182.95	1,701.44	9,001.01
City park	2.20	acres	89.90	197.78	1,125.38
Supermarket	35.00	1000 sq ft	7,587.28	265,554.79	1,082,730.48
Office park	17.70	1000 sq ft	1,720.62	30,454.98	213,919.28
Well SIte/Electric Substation	2.50	acres	1.40	3.50	23.93
Fire Station	3.00	acres	12.00	36.00	246.19
Water Tank Storage	2.50	acres	1.80	4.50	30.77
Wastewater Treatment	4.96	acres	2.20	10.91	74.62
Solid Waste Recycling/ Recycle Center	4.96	acres	0.70	3.47	23.74
				383,068.09	1,877,542.60

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	40.3	0.0	100.0	0.0
Light Truck < 3750 lbs	13.9	0.0	97.8	2.2
Light Truck 3751-5750 lbs	22.4	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.0	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	2.6	0.0	76.9	23.1
Lite-Heavy Truck 10,001-14,000 lbs	0.9	0.0	55.6	44.4
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	1.0	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	5.5	34.5	65.5	0.0

School Bus	0.1	0.0	0.0	100.0
Motor Home	1.3	0.0	84.6	15.4

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Elementary school				20.0	10.0	70.0
Junior high school				20.0	10.0	70.0
Place of worship				3.0	1.5	95.5
City park				5.0	2.5	92.5
Supermarket				2.0	1.0	97.0
Office park				48.0	24.0	28.0
Well SIte/Electric Substation				2.0	1.0	97.0
Fire Station				2.0	1.0	97.0
Water Tank Storage				2.0	1.0	97.0
Wastewater Treatment				2.0	1.0	97.0
Solid Waste Recycling/ Recycle Center				2.0	1.0	97.0

Operational Specific Plan Cumulative Buildout 2035

9/22/2009
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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Projects\Roseville Sierra Vista Specific Plan\Subconsultant\Roseville SVSP Operational Criteria Pollutant Files\2035 Cumulative Operational.urb924
Project Name: 2035 Cumulative Operation

Project Location: Placer County APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	704.50	220.55	307.59	0.01	0.85	0.84	269,680.24

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	2,775.96	3,232.79	27,920.79	23.11	3,975.73	775.34	2,361,491.00

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	3,480.46	3,453.34	28,228.38	23.12	3,976.58	776.18	2,631,171.24

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	16.30	218.69	145.90	0.00	0.40	0.40	269,416.37
Hearth - No Summer Emissions							
Landscape	27.19	1.86	161.69	0.01	0.45	0.44	263.87
Consumer Products	488.99						
Architectural Coatings	172.02						
TOTALS (lbs/day, unmitigated)	704.50	220.55	307.59	0.01	0.85	0.84	269,680.24

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	235.95	287.31	2,556.70	2.15	369.47	72.00	219,392.33
Apartments low rise	295.90	360.32	3,206.35	2.70	463.35	90.30	275,139.56
Apartments mid rise	142.61	166.03	1,477.44	1.24	213.50	41.61	126,779.99
Apartments high rise	17.25	20.08	178.71	0.15	25.83	5.03	15,335.48
Elementary school	190.10	218.74	1,897.60	1.57	270.65	52.78	160,748.07
Junior high school	46.88	55.33	478.85	0.40	69.13	13.47	40,973.76
Place of worship	11.07	12.49	105.87	0.09	15.56	3.03	9,183.73
City park	3.19	2.54	21.58	0.02	3.20	0.62	1,884.19

Supermarket	1,670.34	1,906.41	16,204.94	13.27	2,284.61	445.76	1,357,688.59
Office park	147.83	188.87	1,668.97	1.41	241.58	47.08	143,302.15
Fire Station	14.61	14.42	121.66	0.11	18.53	3.60	10,873.55
Well Sites/Electric Substation	0.03	0.03	0.27	0.00	0.04	0.01	24.27
Solid Waste Recycle/ Recycle Center/Wastewater treatment	0.16	0.18	1.50	0.00	0.23	0.04	134.13
Water Tank Storage	0.04	0.04	0.35	0.00	0.05	0.01	31.20
TOTALS (lbs/day, unmitigated)	2,775.96	3,232.79	27,920.79	23.11	3,975.73	775.34	2,361,491.00

Operational Settings:

Includes correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2010 Temperature (F): 85 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	635.90	9.00	dwelling units	3,172.00	28,548.00	213,689.27
Apartments low rise	397.80	9.00	dwelling units	3,978.00	35,802.00	267,987.37
Apartments mid rise	114.40	6.50	dwelling units	2,538.00	16,497.00	123,484.38
Apartments high rise	42.50	6.50	dwelling units	307.00	1,995.50	14,936.84
Elementary school		14.49	1000 sq ft	2,090.88	30,296.85	156,511.10
Junior high school		13.78	1000 sq ft	522.72	7,203.08	39,984.52
Place of worship		9.30	1000 sq ft	182.95	1,701.44	9,001.01
City park		2.20	acres	147.70	324.94	1,848.93

Supermarket	35.00	1000 sq ft	9,256.50	323,977.50	1,320,933.84
Office park	17.70	1000 sq ft	1,123.85	19,892.15	139,724.74
Fire Station	3.00	1000 sq ft	522.72	1,568.16	10,723.90
Well Sites/Electric Substation	2.50	acres	1.40	3.50	23.93
Solid Waste Recycle/ Recycle Center/Wastewater treatment	4.96	acres	3.90	19.34	132.28
Water Tank Storage	2.50	acres	1.80	4.50	30.77
				467,833.96	2,299,012.88

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	39.8	1.3	98.4	0.3
Light Truck < 3750 lbs	14.2	2.8	88.7	8.5
Light Truck 3751-5750 lbs	22.4	0.9	98.7	0.4
Med Truck 5751-8500 lbs	11.0	0.9	99.1	0.0
Lite-Heavy Truck 8501-10,000 lbs	2.6	0.0	73.1	26.9
Lite-Heavy Truck 10,001-14,000 lbs	0.9	0.0	44.4	55.6
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	1.2	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	5.5	67.3	32.7	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.3	0.0	84.6	15.4

Travel Conditions

Residential	Commercial

	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Elementary school				20.0	10.0	70.0
Junior high school				20.0	10.0	70.0
Place of worship				3.0	1.5	95.5
City park				5.0	2.5	92.5
Supermarket				2.0	1.0	97.0
Office park				48.0	24.0	28.0
Fire Station				2.0	1.0	97.0
Well Sites/Electric Substation				2.0	1.0	97.0
Solid Waste Recycle/ Recycle Center/Wastewater treatment				2.0	1.0	97.0
Water Tank Storage				2.0	1.0	97.0

Operational Alternative 1 Buildout 2025

Page: 1
9/22/2009
10:41:57 AM

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Projects\Roseville Sierra Vista Specific Plan\Subconsultant\Roseville SVSP Operational Criteria Pollutant Files\Alternative I.urb924

Project Name: Alternative 1 reduced footprint, increased density

Project Location: Placer County APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	439.11	134.62	121.69	0.00	0.35	0.34	165,076.92

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	851.12	639.80	7,274.97	14.59	2,516.56	478.79	1,499,022.62

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	1,290.23	774.42	7,396.66	14.59	2,516.91	479.13	1,664,099.54

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	9.98	134.24	91.47	0.00	0.25	0.24	165,024.14
Hearth - No Summer Emissions							
Landscape	3.43	0.38	30.22	0.00	0.10	0.10	52.78
Consumer Products	325.97						
Architectural Coatings	99.73						
TOTALS (lbs/day, unmitigated)	439.11	134.62	121.69	0.00	0.35	0.34	165,076.92

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	8.25	6.36	74.99	0.15	26.26	4.99	15,642.78
Apartments low rise	140.01	107.99	1,273.20	2.59	445.80	84.77	265,582.65
Apartments mid rise	66.35	48.55	572.38	1.17	200.42	38.11	119,395.81
Apartments high rise	5.06	3.70	43.66	0.09	15.29	2.91	9,107.73
Elementary school	69.40	51.09	582.63	1.17	201.58	38.35	120,079.36
Junior high school	40.00	30.12	343.14	0.70	120.14	22.84	71,420.99
Place of worship	6.11	4.35	48.51	0.10	17.29	3.28	10,235.43
City park	0.61	0.29	3.24	0.01	1.16	0.22	688.66

Supermarket	449.09	333.27	3,701.08	7.33	1,266.85	241.15	754,894.17
Office park	66.07	53.97	630.93	1.28	221.33	42.08	131,713.27
Fire Station	0.05	0.03	0.31	0.00	0.11	0.02	66.31
Well Site/electric substation	0.02	0.01	0.11	0.00	0.04	0.01	24.17
Domestic Water/Recycled Water	0.09	0.06	0.71	0.00	0.26	0.05	154.16
Recycle Center	0.01	0.01	0.08	0.00	0.03	0.01	17.13
TOTALS (lbs/day, unmitigated)	851.12	639.80	7,274.97	14.59	2,516.56	478.79	1,499,022.62

Operational Settings:

Includes correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2025 Temperature (F): 85 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	45.40	9.00	dwelling units	227.00	2,043.00	15,292.39
Apartments low rise	426.30	9.00	dwelling units	3,854.00	34,686.00	259,633.81
Apartments mid rise	104.10	6.50	dwelling units	2,399.00	15,593.50	116,721.44
Apartments high rise	15.40	6.50	dwelling units	183.00	1,189.50	8,903.72
Elementary school		14.49	1000 sq ft	1,568.16	22,722.64	117,383.33
Junior high school		13.78	1000 sq ft	914.76	12,605.39	69,972.91
Place of worship		9.30	1000 sq ft	204.73	1,903.99	10,072.57
City park		2.20	acres	54.20	119.24	678.48
Supermarket		35.00	1000 sq ft	5,168.83	180,909.05	737,609.53

Office park	17.70	1000 sq ft	1,036.83	18,351.89	128,905.81
Fire Station	3.00	acres	3.20	9.60	65.65
Well Site/electric substation	2.50	acres	1.40	3.50	23.93
Domestic Water/Recycled Water	4.96	acres	4.50	22.32	152.64
Recycle Center	4.96	acres	0.50	2.48	16.96
				290,162.10	1,465,433.17

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	40.3	0.0	100.0	0.0
Light Truck < 3750 lbs	13.9	0.0	97.8	2.2
Light Truck 3751-5750 lbs	22.4	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.0	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	2.6	0.0	76.9	23.1
Lite-Heavy Truck 10,001-14,000 lbs	0.9	0.0	55.6	44.4
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	1.0	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	5.5	34.5	65.5	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.3	0.0	84.6	15.4

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer

Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Elementary school				20.0	10.0	70.0
Junior high school				20.0	10.0	70.0
Place of worship				3.0	1.5	95.5
City park				5.0	2.5	92.5
Supermarket				2.0	1.0	97.0
Office park				48.0	24.0	28.0
Fire Station				2.0	1.0	97.0
Well Site/electric substation				2.0	1.0	97.0
Domestic Water/Recycled Water				2.0	1.0	97.0
Recycle Center				2.0	1.0	97.0

Operational Alternative 2 Buildout 2025

Page: 1
9/22/2009
10:40:08 AM

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Projects\Roseville Sierra Vista Specific Plan\Subconsultant\Roseville SVSP Operational Criteria Pollutant Files\Alternative 2.urb924

Project Name: Alternative 2 reduced footprint, same density

Project Location: Placer County APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	363.39	123.17	181.89	0.00	0.50	0.50	150,108.92

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	763.82	580.10	6,612.70	13.28	2,291.08	435.86	1,364,516.97

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	1,127.21	703.27	6,794.59	13.28	2,291.58	436.36	1,514,625.89

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	9.07	122.02	83.46	0.00	0.22	0.22	149,946.61
Hearth - No Summer Emissions							
Landscape	15.76	1.15	98.43	0.00	0.28	0.28	162.31
Consumer Products	241.14						
Architectural Coatings	97.42						
TOTALS (lbs/day, unmitigated)	363.39	123.17	181.89	0.00	0.50	0.50	150,108.92

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	63.76	49.18	579.78	1.18	203.01	38.60	120,938.65
Apartments low rise	64.63	49.85	587.71	1.20	205.78	39.13	122,592.51
Apartments mid rise	35.85	26.23	309.22	0.63	108.27	20.59	64,500.61
Apartments high rise	2.74	2.00	23.62	0.05	8.27	1.57	4,927.13
Elementary school	46.26	34.06	388.42	0.78	134.39	25.57	80,052.90
Junior high school	40.00	30.12	343.14	0.70	120.14	22.84	71,420.99
Place of worship	6.11	4.35	48.51	0.10	17.29	3.28	10,235.43
City park	0.39	0.16	1.77	0.00	0.64	0.12	375.58

Supermarket	369.01	273.84	3,041.08	6.02	1,040.94	198.15	620,277.90
Office park	134.90	110.20	1,288.24	2.62	451.91	85.92	268,933.50
Fire Station	0.05	0.03	0.31	0.00	0.11	0.02	66.31
Well Site/electric substation	0.02	0.01	0.11	0.00	0.04	0.01	24.17
Domestic Water/Recycled Water	0.09	0.06	0.71	0.00	0.26	0.05	154.16
Recycle Center	0.01	0.01	0.08	0.00	0.03	0.01	17.13
TOTALS (lbs/day, unmitigated)	763.82	580.10	6,612.70	13.28	2,291.08	435.86	1,364,516.97

Operational Settings:

Includes correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2025 Temperature (F): 85 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	351.10	9.00	dwelling units	1,755.00	15,795.00	118,229.72
Apartments low rise	197.70	9.00	dwelling units	1,779.00	16,011.00	119,846.54
Apartments mid rise	51.10	6.50	dwelling units	1,296.00	8,424.00	63,055.85
Apartments high rise	12.40	6.50	dwelling units	99.00	643.50	4,816.77
Elementary school		14.49	1000 sq ft	1,045.44	15,148.42	78,255.55
Junior high school		13.78	1000 sq ft	914.76	12,605.39	69,972.91
Place of worship		9.30	1000 sq ft	204.73	1,903.99	10,072.57
City park		1.59	acres	40.90	65.03	370.03
Supermarket		35.00	1000 sq ft	4,247.10	148,648.50	606,075.54

Office park	17.70	1000 sq ft	2,117.01	37,471.08	263,201.20
Fire Station	3.00	acres	3.20	9.60	65.65
Well Site/electric substation	2.50	acres	1.40	3.50	23.93
Domestic Water/Recycled Water	4.96	acres	4.50	22.32	152.64
Recycle Center	4.96	acres	0.50	2.48	16.96
				256,753.81	1,334,155.86

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	40.3	0.0	100.0	0.0
Light Truck < 3750 lbs	13.9	0.0	97.8	2.2
Light Truck 3751-5750 lbs	22.4	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.0	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	2.6	0.0	76.9	23.1
Lite-Heavy Truck 10,001-14,000 lbs	0.9	0.0	55.6	44.4
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	1.0	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	5.5	34.5	65.5	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.3	0.0	84.6	15.4

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer

Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Elementary school				20.0	10.0	70.0
Junior high school				20.0	10.0	70.0
Place of worship				3.0	1.5	95.5
City park				5.0	2.5	92.5
Supermarket				2.0	1.0	97.0
Office park				48.0	24.0	28.0
Fire Station				2.0	1.0	97.0
Well Site/electric substation				2.0	1.0	97.0
Domestic Water/Recycled Water				2.0	1.0	97.0
Recycle Center				2.0	1.0	97.0

Operational Alternative 3 Buildout 2025

Page: 1
9/22/2009
10:41:06 AM

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Projects\Roseville Sierra Vista Specific Plan\Subconsultant\Roseville SVSP Operational Criteria Pollutant Files\Alternative 3.urb924

Project Name: Alternative 3 project footprint, reduced density

Project Location: Placer County APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	413.91	158.57	297.77	0.01	0.81	0.80	192,327.38

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	954.42	717.31	8,116.15	16.23	2,801.98	533.17	1,669,098.58

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	1,368.33	875.88	8,413.92	16.24	2,802.79	533.97	1,861,425.96

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	11.62	156.39	107.85	0.00	0.29	0.28	192,018.51
Hearth - No Summer Emissions							
Landscape	32.45	2.18	189.92	0.01	0.52	0.52	308.87
Consumer Products	243.93						
Architectural Coatings	125.91						
TOTALS (lbs/day, unmitigated)	413.91	158.57	297.77	0.01	0.81	0.80	192,327.38

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	139.46	107.57	1,268.25	2.58	444.07	84.44	264,548.99
Apartments mid rise	24.67	18.05	212.82	0.43	74.52	14.17	44,393.94
Apartments high rise	7.05	5.16	60.84	0.12	21.30	4.05	12,691.09
Elementary school	69.40	51.09	582.63	1.17	201.58	38.35	120,079.36
Junior high school	41.14	30.98	352.95	0.72	123.58	23.50	73,461.90
Place of worship	5.46	3.89	43.35	0.09	15.45	2.94	9,146.55
City park	0.90	0.43	4.80	0.01	1.72	0.33	1,019.02
Supermarket	590.41	438.14	4,865.74	9.64	1,665.50	317.04	992,444.60

Office park	75.78	61.90	723.64	1.47	253.85	48.27	151,068.26
Fire Station	0.04	0.02	0.27	0.00	0.10	0.02	58.02
Well Site/electric substation	0.01	0.01	0.09	0.00	0.03	0.01	18.99
Domestic Water/Recycled Water	0.09	0.06	0.71	0.00	0.26	0.05	154.16
Recycle Center	0.01	0.01	0.06	0.00	0.02	0.00	13.70
TOTALS (lbs/day, unmitigated)	954.42	717.31	8,116.15	16.23	2,801.98	533.17	1,669,098.58

Operational Settings:

Includes correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2025 Temperature (F): 85 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	767.80	9.00	dwelling units	3,839.00	34,551.00	258,623.30
Apartments mid rise	66.10	6.50	dwelling units	892.00	5,798.00	43,399.55
Apartments high rise	31.90	6.50	dwelling units	255.00	1,657.50	12,406.82
Elementary school		14.49	1000 sq ft	1,568.16	22,722.64	117,383.33
Junior high school		13.78	1000 sq ft	940.90	12,965.60	71,972.45
Place of worship		9.30	1000 sq ft	182.95	1,701.44	9,001.01
City park		2.20	acres	80.20	176.44	1,003.96
Supermarket		35.00	1000 sq ft	6,795.36	237,837.60	969,720.83
Office park		17.70	1000 sq ft	1,189.19	21,048.66	147,848.25
Fire Station		3.00	acres	2.80	8.40	57.44

Well Site/electric substation	2.50	acres	1.10	2.75	18.81
Domestic Water/Recycled Water	4.96	acres	4.50	22.32	152.64
Recycle Center	4.96	acres	0.40	1.98	13.57
				338,494.33	1,631,601.96

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	40.3	0.0	100.0	0.0
Light Truck < 3750 lbs	13.9	0.0	97.8	2.2
Light Truck 3751-5750 lbs	22.4	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.0	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	2.6	0.0	76.9	23.1
Lite-Heavy Truck 10,001-14,000 lbs	0.9	0.0	55.6	44.4
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	1.0	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	5.5	34.5	65.5	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.3	0.0	84.6	15.4

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6

Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Elementary school				20.0	10.0	70.0
Junior high school				20.0	10.0	70.0
Place of worship				3.0	1.5	95.5
City park				5.0	2.5	92.5
Supermarket				2.0	1.0	97.0
Office park				48.0	24.0	28.0
Fire Station				2.0	1.0	97.0
Well Site/electric substation				2.0	1.0	97.0
Domestic Water/Recycled Water				2.0	1.0	97.0
Recycle Center				2.0	1.0	97.0

Operational GHGs

Water – Preferred Alternative: 2025 and 2035

2025 Water Delivery, Treatment				
				TOTAL
Demand (AF/yr)				5,500
Recycled Water Demand (AF/yr)				2,712
	CO2	CH4	N2O	
Emissions CO2e (treatment) pounds/yr	240,125	2	1	109
Emissions CO2e (distribution) pounds/yr	2,574,796	22	12	1,170
Emissions CO2e (supply) pounds/yr	1,039,084	9	5	472
Metric tons/year	1,747.79	0.01	0.01	1,750.98

2035 Water Delivery, Treatment				
				TOTAL
Demand (AF/yr)				11181
Recycled Water Demand (AF/yr)				2712
	CO2	CH4	N2O	
Emissions CO2e (treatment) pounds/yr	488,142.76	4.12	2.28	221.78
Emissions CO2e (distribution) lbs/yr	4,356,018.53	36.77	20.30	1,979.06
Emissions CO2e (supply) lbs/yr	2,112,326.86	17.83	9.85	959.69
Metric tons/year	3,154.77	0.03	0.01	3,160.53

Wastewater – Preferred Alternative: 2025 and 2035

Wastewater 2025				**TOTAL**
Demand (AF/yr)				2,442.80
	CO2	CH4	N2O	
Emissions CO2e (treatment)	853,201.29	7.20	3.98	387.63
Emissions CO2e (reclamation)	678,682.85	5.73	3.16	308.34
	694.71	0.01	0.00	695.98

Wastewater 2035				
				TOTAL
Demand (AF/yr)	CO2	CH4	N2O	8123.60
Emissions CO2e (treatment)	2,837,347.39	23.95	13.23	1,289.1
Emissions CO2e (reclamation)	2,256,980.88	19.05	10.52	1,025.4
	2,310.28	0.02	0.01	2,314.5

Solid Waste - Preferred Alternative: 2025 and 2035

2025 Population		CH4 Emissions	CO2e
	16904	136.823231	2873.287851
2.54 persons per household			

2035 Population		CH4 Emissions	CO2e
	25387.3	205.4881929	4315.252051

Electricity – Preferred Alternative: 2025 and 2035

Electricity	for this analysis 1 VA = 1 W						
	residential	**commercial**	**business**	**schools**	**public fac.**	**TOTAL**	
Avg Demand (MVA)	15.5	5.8	0.7	0.3	1.7	24	
Annual Avg Demand (MWh/yr)	135,780	50,808	6,132	2,628	14,892	210,240	
							After Line Loss
Emissions CO2 (metric tpy)	48,879	18,290	22,074	946	5,361	75,683.94	65,845.03
Emissions CH4 (metric tpy)	0	0	0	0	0	0.64	0.56
Emissions N2O (metric tpy)	0	0	0	0	0	0.35	0.31
Emissions CO2e (metric tpy)	48,968	18,324	2,211	948	5,371	75,822.15	65,965.27
							TOTAL + 2035 cumulative project
2035 additional homes	23,497	MWh/yr				8,458.61	74,303.64
						0.07	0.63
						0.04	0.35
						8,474.06	74,439.33

Source(s)

Sierra Vista Specific Plan Technical Dry Utilities Study (2009)

GWPs

CO2	1
CH4	21
N2O	310

0.0005 metric ton/lb

ELECTRICITY EMISSION FACTORS

http://www.roseville.ca.us/electric/default.asp

CO2	793.8	lb/MWh delivered	
CH4	0.0067	lb/MWh	CCAR GENERAL REPORTING PROTOCOL
N2O	0.0037	lb/MWh	CCAR GENERAL REPORTING PROTOCOL
CO2e	795.0877	lb/MWh	
CO2e	**0.3606**	**metric ton/MWh**	

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Projects\Roseville Sierra Vista Specific Plan\Subconsultant\2025 Operational.urb924

Project Name: 2025 Operational

Project Location: Placer County APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	CO2
TOTALS (tons/year, unmitigated)	45,516.41

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	CO2
TOTALS (tons/year, unmitigated)	335,235.11

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	CO2
TOTALS (tons/year, unmitigated)	380,751.52

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	CO2
Natural Gas	37,890.27
Hearth	7,607.01
Landscape	19.13
Consumer Products	
Architectural Coatings	
TOTALS (tons/year, unmitigated)	45,516.41

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	CO2
Single family housing	29,070.13
Apartments low rise	28,264.30
Apartments mid rise	14,184.93
Apartments high rise	2,215.04
Elementary school	20,958.09
Junior high school	7,122.41
Place of worship	1,595.91
City park	199.29
Supermarket	193,407.06

Office park	38,147.61
Well SIte/Electric Substation	4.22
Fire Station	43.37
Water Tank Storage	5.42
Wastewater Treatment	13.15
Solid Waste Recycling/ Recycle Center	4.18
TOTALS (tons/year, unmitigated)	335,235.11

Operational Settings:

Includes correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2025 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	484.60	9.00	dwelling units	2,417.00	21,753.00	162,826.91
Apartments low rise	261.60	9.00	dwelling units	2,350.00	21,150.00	158,313.30
Apartments mid rise	66.10	6.50	dwelling units	1,633.00	10,614.50	79,452.32
Apartments high rise	34.30	6.50	dwelling units	255.00	1,657.50	12,406.82
Elementary school		14.49	1000 sq ft	1,568.16	22,722.64	117,383.33
Junior high school		13.78	1000 sq ft	522.72	7,203.08	39,984.52
Place of worship		9.30	1000 sq ft	182.95	1,701.44	9,001.01
City park		2.20	acres	89.90	197.78	1,125.38
Supermarket		35.00	1000 sq ft	7,587.28	265,554.79	1,082,730.48
Office park		17.70	1000 sq ft	1,720.62	30,454.98	213,919.28

Well SIte/Electric Substation	2.50	acres	1.40	3.50	23.93
Fire Station	3.00	acres	12.00	36.00	246.19
Water Tank Storage	2.50	acres	1.80	4.50	30.77
Wastewater Treatment	4.96	acres	2.20	10.91	74.62
Solid Waste Recycling/ Recycle Center	4.96	acres	0.70	3.47	23.74
				383,068.09	1,877,542.60

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	40.3	0.0	100.0	0.0
Light Truck < 3750 lbs	13.9	0.0	97.8	2.2
Light Truck 3751-5750 lbs	22.4	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.0	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	2.6	0.0	76.9	23.1
Lite-Heavy Truck 10,001-14,000 lbs	0.9	0.0	55.6	44.4
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	1.0	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	5.5	34.5	65.5	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.3	0.0	84.6	15.4

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6

Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Elementary school				20.0	10.0	70.0
Junior high school				20.0	10.0	70.0
Place of worship				3.0	1.5	95.5
City park				5.0	2.5	92.5
Supermarket				2.0	1.0	97.0
Office park				48.0	24.0	28.0
Well SIte/Electric Substation				2.0	1.0	97.0
Fire Station				2.0	1.0	97.0
Water Tank Storage				2.0	1.0	97.0
Wastewater Treatment				2.0	1.0	97.0
Solid Waste Recycling/ Recycle Center				2.0	1.0	97.0

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Projects\Roseville Sierra Vista Specific Plan\Subconsultant\2035 Cumulative Operational.urb924

Project Name: 2035 Cumulative Operation

Project Location: Placer County APCD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	CO2
TOTALS (tons/year, unmitigated)	60,616.59

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	CO2
TOTALS (tons/year, unmitigated)	412,930.68

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	CO2
TOTALS (tons/year, unmitigated)	473,547.27

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	CO2
Natural Gas	49,168.49
Hearth	11,424.35
Landscape	23.75
Consumer Products	
Architectural Coatings	
TOTALS (tons/year, unmitigated)	60,616.59

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	CO2
Single family housing	38,362.18
Apartments low rise	48,109.95
Apartments mid rise	22,168.31
Apartments high rise	2,681.51
Elementary school	28,108.31
Junior high school	7,163.93
Place of worship	1,605.40
City park	329.36
Supermarket	237,412.17

Office park	25,056.16
Fire Station	1,900.27
Well Sites/Electric Substation	4.24
Solid Waste Recycle/ Recycle Center/Wastewater treatment	23.44
Water Tank Storage	5.45
TOTALS (tons/year, unmitigated)	412,930.68

Operational Settings:

Includes correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2010 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	635.90	9.00	dwelling units	3,172.00	28,548.00	213,689.27
Apartments low rise	397.80	9.00	dwelling units	3,978.00	35,802.00	267,987.37
Apartments mid rise	114.40	6.50	dwelling units	2,538.00	16,497.00	123,484.38
Apartments high rise	42.50	6.50	dwelling units	307.00	1,995.50	14,936.84
Elementary school		14.49	1000 sq ft	2,090.88	30,296.85	156,511.10
Junior high school		13.78	1000 sq ft	522.72	7,203.08	39,984.52
Place of worship		9.30	1000 sq ft	182.95	1,701.44	9,001.01
City park		2.20	acres	147.70	324.94	1,848.93
Supermarket		35.00	1000 sq ft	9,256.50	323,977.50	1,320,933.84
Office park		17.70	1000 sq ft	1,123.85	19,892.15	139,724.74
Fire Station		3.00	1000 sq ft	522.72	1,568.16	10,723.90

Well Sites/Electric Substation	2.50	acres	1.40	3.50	23.93
Solid Waste Recycle/ Recycle Center/Wastewater treatment	4.96	acres	3.90	19.34	132.28
Water Tank Storage	2.50	acres	1.80	4.50	30.77
				467,833.96	2,299,012.88

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	39.8	1.3	98.4	0.3
Light Truck < 3750 lbs	14.2	2.8	88.7	8.5
Light Truck 3751-5750 lbs	22.4	0.9	98.7	0.4
Med Truck 5751-8500 lbs	11.0	0.9	99.1	0.0
Lite-Heavy Truck 8501-10,000 lbs	2.6	0.0	73.1	26.9
Lite-Heavy Truck 10,001-14,000 lbs	0.9	0.0	44.4	55.6
Med-Heavy Truck 14,001-33,000 lbs	0.9	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	1.2	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	5.5	67.3	32.7	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.3	0.0	84.6	15.4

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0

% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Elementary school				20.0	10.0	70.0
Junior high school				20.0	10.0	70.0
Place of worship				3.0	1.5	95.5
City park				5.0	2.5	92.5
Supermarket				2.0	1.0	97.0
Office park				48.0	24.0	28.0
Fire Station				2.0	1.0	97.0
Well Sites/Electric Substation				2.0	1.0	97.0
Solid Waste Recycle/ Recycle Center/Wastewater treatment				2.0	1.0	97.0
Water Tank Storage				2.0	1.0	97.0

Alternative 1, 2, and 3 GHG Emissions - Unmitigated

UNMITIGATED

Alternative 1

Buildout (2025)	CO_2	CH_4	N_2O	CO_2e
Water	1,749.90	0.01	0.01	1,753.22
Wastewater	695.54	0.01	0.00	695.75
Solid Waste	-	136.96	-	2,876.20
Area Sources	27,330.33	-	-	27,330.33
Electricity	65,924.15	0.60	0.31	66,032.98
Transportation	248,180.00	-	-	260,589.00
Total	343,879.92	137.58	0.32	359,277.48

Alternative 2

Buildout (2025)				
Water	1,294.50	0.01	0.01	1,296.95
Wastewater	514.53	0.01	0.00	514.68
Solid Waste	-	101.32	-	2,127.69
Area Sources	24,852.21	-	-	24,852.21
Electricity	48,767.84	0.44	0.23	48,848.35
Transportation	225,911.09	-	-	237,206.65
Total	301,340.18	101.78	0.24	314,846.54

Alternative 3

Buildout (2025)				
Water	1,309.47	0.01	0.01	1,311.95
Wastewater	520.48	0.01	0.00	520.63
Solid Waste	-	102.49	-	2,152.30

Notes on Alternatives GHG Estimates

All numbers adjusted according to 2.54 persons per dwelling unit estimate included in project description. As different numbers of dwelling units changed for each alternative, the total population changed. Therefore, all greenhouse gas emissions are based on original GHG emission estimates for 2025 and adjusted on a per capita, or per dwelling unit basis.

Sources:

Sierra Vista Specific Plan Technical Dry Utilities Study (2009)

http://www.eia.doe.gov/emeu/cbecs/pba99/lodging/lodgingbtu.html

http://www.energy.ca.gov/2005publications/CEC-500-2005-031/CEC-500-2005-031.PDF

http://www.energy.ca.gov/2005publications/CEC-500-2005-031/CEC-500-2005-031.PDF

http://www.arb.ca.gov/cc/inventory/doc/docs4/4a1_landfills_landfillemissions_landfillgas_ch4_2006.ht

http://www.dof.ca.gov/research/demographic/reports/estimates/e-4/2001-09/

Area Sources	31,841.96	-	-	31,841.96
Electricity	49,331.81	0.45	0.23	49,413.25
Transportation	276,337.99	-	-	290,154.89
Total	359,341.70	102.95	0.24	375,394.98

Alternative 1, 2, and 3 GHG Emissions - Mitigated

MITIGATED

Alternative 1

Buildout (2025)	CO_2	CH_4	N_2O	CO_2e
Water	1,749.90	0.01	0.01	1,753.22
Wastewater	695.54	0.01	0.00	695.75
Solid Waste	-	136.96	-	2,876.20
Area Sources	27,330.33	-	-	27,330.33
Electricity	65,924.15	0.60	0.31	66,032.98
Transportation	223,362.00	-	-	234,530.10
Total	319,061.92	137.58	0.32	333,218.58

Alternative 2

Buildout (2025)				
Water	1,294.50	0.01	0.01	1,296.95
Wasewater	514.53	0.01	0.00	514.68
Solid Waste	-	101.32	-	2,127.69
Area Sources	24,852.21	-	-	24,852.21
Electricity	48,767.84	0.44	0.23	48,848.35
Transportation	203,319.98	-	-	214,021.03
Total	278,749.07	101.78	0.24	291,660.93

Alternative 3

Buildout (2025)				
Water	1,309.47	0.01	0.01	1,311.95
Wastewater	520.48	0.01	0.00	520.63
Solid Waste	-	102.49	-	2,152.30
Area Sources	31,841.96	-	-	31,841.96
Electricity	49,331.81	0.45	0.23	49,413.25
Transportation	248,704.19	-	-	261,793.89
Total	331,707.91	102.95	0.24	347,033.97