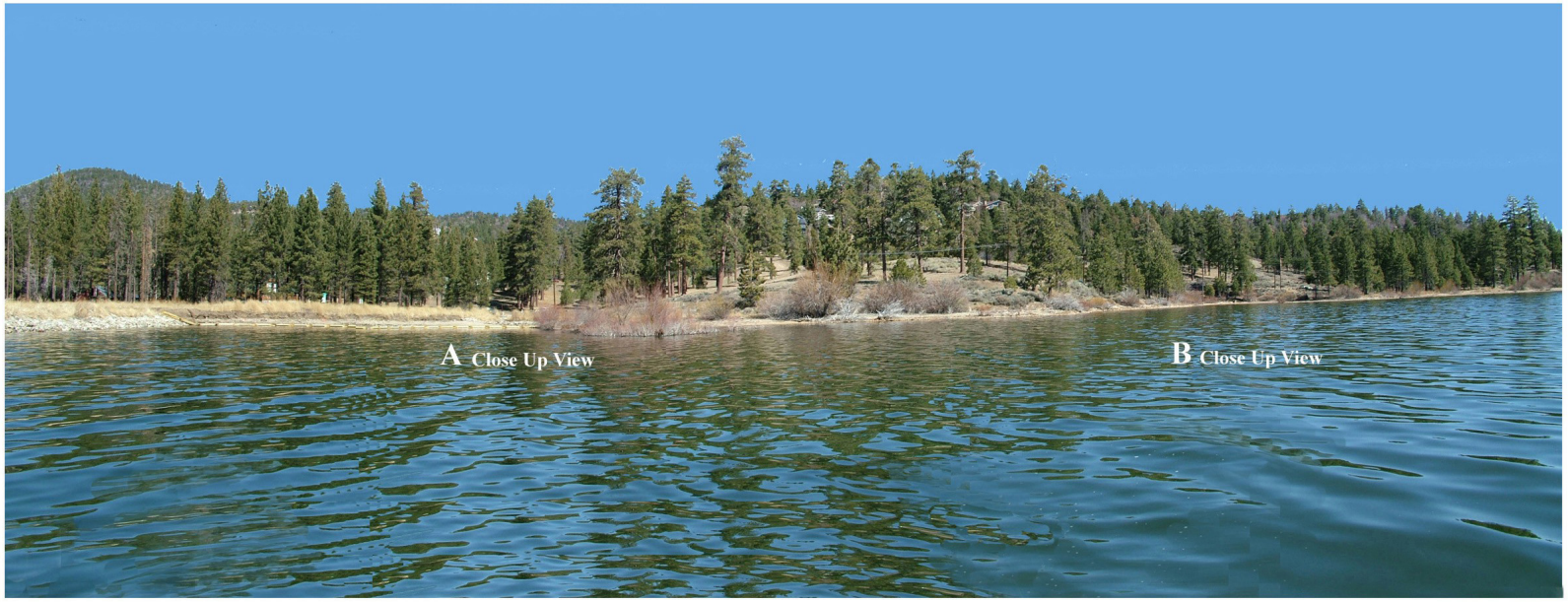
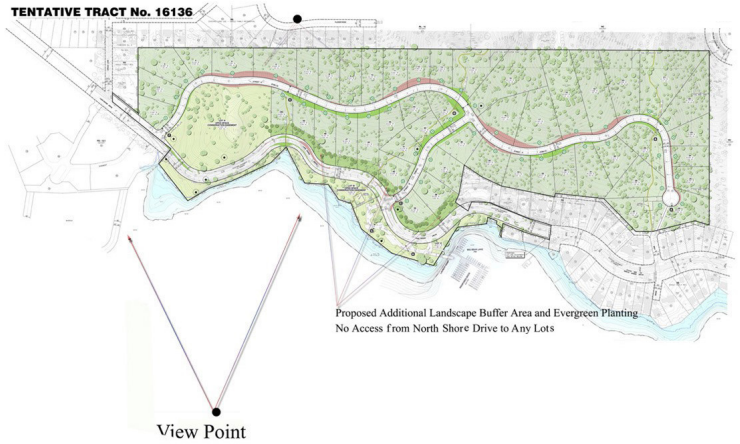
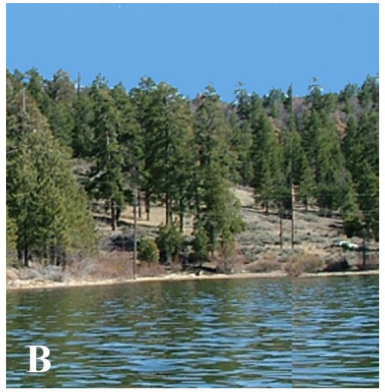






Source: Bauer Planning & Environmental Services Inc (September 26, 2007).

NORTH

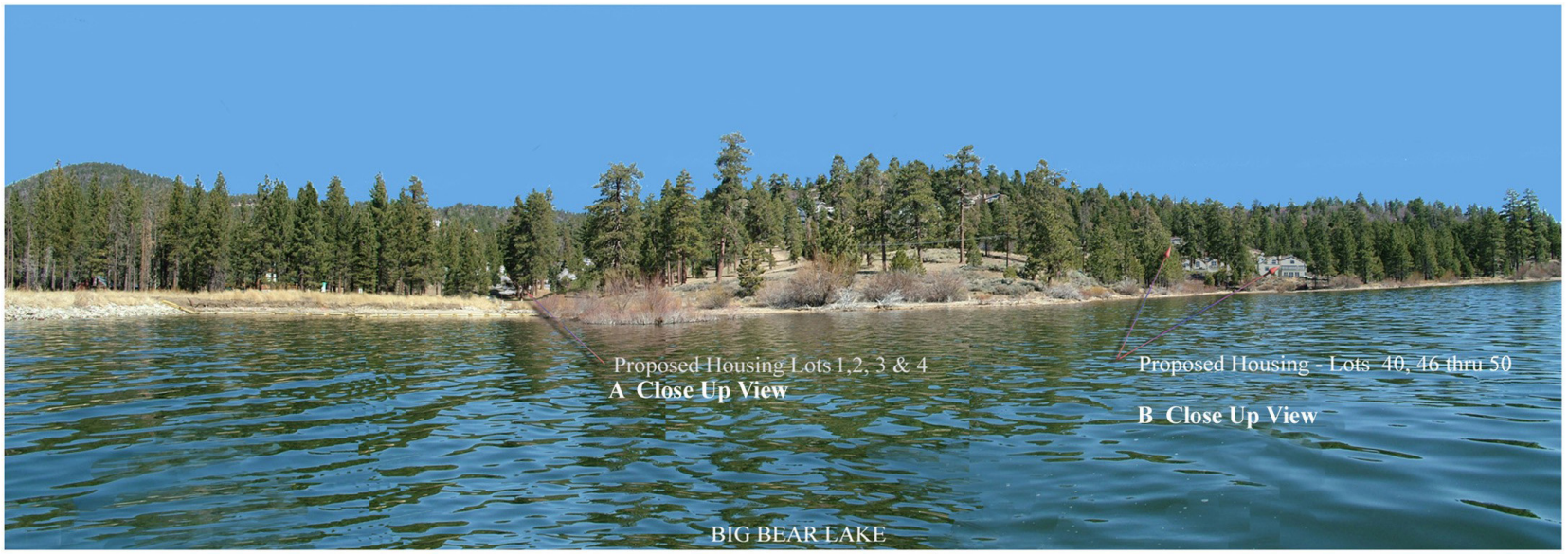
Not To Scale

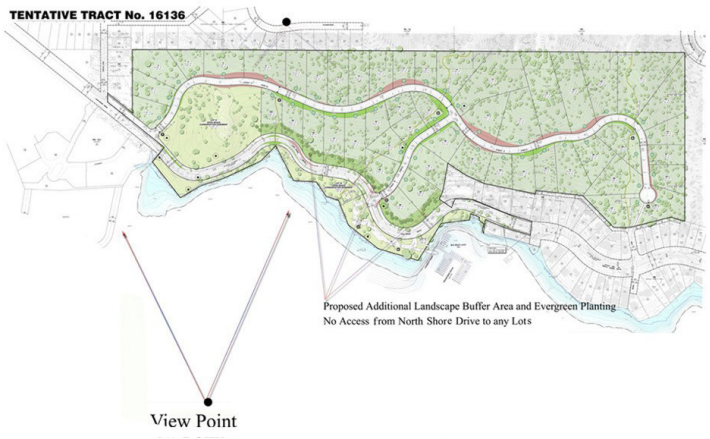
Michael Brandman Associates

00520089 • 12/2009 | 4.1-9_Ex_View_from_BLL.ai

Exhibit 4.1-9
Existing View Looking North from Big Bear Lake

SAN BERNARDINO COUNTY
MOON CAMP RESIDENTIAL SUBDIVISION PROJECT





Source: Bauer Planning & Environmental Services Inc (September 26, 2007).

NORTH

Not To Scale

Michael Brandman Associates

00520089 • 12/2009 | 4.1-10_Sim_View_from_BLL.ai

Exhibit 4.1-10
Simulated View Looking North from Big Bear Lake Landscape Buffer

SAN BERNARDINO COUNTY
MOON CAMP RESIDENTIAL SUBDIVISION PROJECT

4.2 - Air Quality

This section analyzes the potential air quality impacts that would result from the development of the Moon Camp Residential Development Proposed Alternative Project (50 residential lots) and is based on the *"*Air Quality Analysis Report, Moon Camp Tentative Tract, Community of Fawnskin, San Bernardino County, California*"* (MBA 2008) included as Appendix A of this document. This assessment was conducted within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000 et seq.). The methodology follows the CEQA Air Quality Handbook prepared by the South Coast Air Quality Management District (SCAQMD) for quantification of emissions and evaluation of potential impacts to air resources. As recommended by SCAQMD staff, URBEMIS 2002 version 8.7.0, developed and approved by the California Air Resources Control Board (CARB), was used to quantify some project-related emissions.

4.2.1 - Existing Conditions

The 62.43-acre project site is located adjacent to the northwest shore of Big Bear Lake, in the eastern portion of Fawnskin (refer to Exhibit 2-1, Regional Location Map). More specifically, the site is located in the northern half of Section 13, Township 2 North, Range 1 West, San Bernardino Base and Meridian. The project site is generally situated between Flicker Road to the north, Big Bear Lake to the south, Polique Canyon Road to the east, and Canyon Road to the west.

Regional access to the site is provided via State Route 38 (SR-38), which currently bisects the property. The Proposed Alternative Project would construct a proposed subdivision consisting of 50 residential lots and seven lettered lots for open space, conservation, neighborhood lake access, well sites, a potential reservoir, and common area. Proposed lot sizes range from one half acre to over 2 acres, and the subdivision would be developed for custom lot sales. Overall density of the Proposed Alternative Project is 0.90 dwelling units per acre. Even though project-specific grading would be limited to the construction of the interior streets and infrastructure and no grading of individual lots is proposed, for the purposes of determining the reasonably foreseeable impacts associated with full construction, this analysis of air quality assumes the construction of the homes.

4.2.2 - Regulatory Setting

Air pollutants are regulated at the international, national, state, and air basin level; each agency has a different degree of control. The United States Environmental Protection Agency (EPA) regulates at the national level. CARB regulates at the state level and the SCAQMD regulates at the air basin level.

International Regulation and the Kyoto Protocol

Although there is no regulation of the emission of criteria pollutants regulated under the Federal Clean Air Act and California Clean Air Act regulations, there is a history of international regulation of greenhouse gas (GHG) emissions. In 1988, the United Nations established the Intergovernmental Panel on Climate Change to evaluate the impacts of global warming and to develop strategies that nations could implement to curtail global climate change. In 1992, the United States (U.S.) joined other countries around the world in signing the United Nations' Framework Convention on Climate

Change (UNFCCC) agreement with the goal of controlling GHG emissions. As a result, the Climate Change Action Plan was developed to address the reduction of GHGs in the United States. The Plan currently consists of more than 50 voluntary programs. The Kyoto protocol is a treaty made under the UNFCCC and was the first international agreement to regulate GHG emissions. Some have estimated that if the commitments outlined in the Kyoto protocol are met, global GHG emissions could be reduced an estimated 5 percent from 1990 levels during the first commitment period of 2008-2012. Notably, while the U.S. is a signatory to the Kyoto protocol, Congress has not ratified the Protocol and the U.S. is not bound by the Protocol's commitments.

Federal and State Regulatory Agencies

The EPA sets national vehicle and stationary source emission standards; oversees approval of all State Implementation Plans (SIPs); provides research and guidance in air pollution programs; and sets National Ambient Air Quality Standards (NAAQS), also known as federal standards. There are NAAQS for six common air pollutants, called criteria air pollutants, which were identified resulting from provisions of the Clean Air Act of 1970.

The six criteria pollutants are:

- Ozone;
- Particulate matter (PM_{10} and $PM_{2.5}$);
- Nitrogen dioxide;
- Carbon monoxide (CO);
- Lead; and
- Sulfur dioxide.

The NAAQS were set to protect the health of sensitive individuals; thus, the standards continue to change as more medical research is available regarding the health effects of the criteria pollutants.

CARB has overall responsibility for statewide air quality maintenance and air pollution prevention. The SIP for the State of California is administered by CARB. A SIP is a document prepared by each state describing existing air quality conditions and measures that will be followed to attain and maintain NAAQS. CARB also administers California ambient air quality standards, or state standards, for the ten air pollutants designated in the California Clean Air Act (CCAA). All of the national criteria pollutants are also regulated by the State, with four additional pollutants added in California. These additional State air pollutants are:

- Visibility reducing particulates;
- Hydrogen sulfide;
- Sulfates; and
- Vinyl chloride.

The national and state ambient air quality standards and the most relevant effects are summarized in Table 4.2-1.

Table 4.2-1: Ambient Air Quality Standards

Air Pollutant	Averaging Time	California Standard	National Standard	Most Relevant Effects
Ozone	1 Hour	0.09 ppm	—	(a) Pulmonary function decrements and localized lung edema in humans and animals; (b) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (c) Increased mortality risk; (d) Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (e) Vegetation damage; (f) Property damage
	8 Hour	0.070 ppm	0.08 ppm	
Carbon Monoxide (CO)	1 Hour	20 ppm	35 ppm	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; (d) Possible increased risk to fetuses
	8 Hour	9.0 ppm	9 ppm	
Nitrogen Dioxide (NO_2)	1 Hour	0.18 ppm*	—	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) Contribution to atmospheric discoloration
	Mean	0.030 ppm*	0.053 ppm	
Sulfur Dioxide (SO_2)	1 Hour	0.25 ppm	—	Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma
	24 Hour	0.04 ppm	0.14 ppm	
	Mean	—	0.030 ppm	
Particulate Matter (PM_{10})	24 hour	50 $\mu g/m^3$	150 $\mu g/m^3$	(a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Declines in pulmonary function growth in children; (c) Increased risk of premature death from heart or lung diseases in the elderly
	Mean	20 $\mu g/m^3$	—	
Particulate Matter ($PM_{2.5}$)	24 Hour	—	35 $\mu g/m^3$	
	Mean	12 $\mu g/m^3$	15 $\mu g/m^3$	
Sulfates	24 Hour	25 $\mu g/m^3$	—	(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) Property damage
Lead	30-day	1.5 $\mu g/m^3$	—	(a) Learning disabilities; (b) Impairment of blood formation and nerve conduction
	Quarter	—	1.5 $\mu g/m^3$	

Abbreviations:
ppm = parts per million $\mu g/m^3$ = micrograms per cubic meter
Mean = Annual Arithmetic Mean 30-day = 30-day average Quarter = Calendar quarter

* The nitrogen dioxide ambient air quality standard was amended on February 22, 2007. These changes become effective after regulatory changes are submitted and approved by the Office of Administrative Law, expected in 2007.
Source: South Coast Air Quality Management District, 2007 AQMP. CARB, Ambient Air Quality Standards, 2007.

Regulatory Setting

In order to determine the significance of air quality impacts that would result from project implementation, those impacts, along with existing air quality levels, must be compared to ambient air quality standards. These standards represent the levels of air quality considered safe, with an adequate margin of safety to protect the public health and welfare.

South Coast Air Quality Management District (SCAQMD)

The air pollution control agency for the South Coast Air Basin (Basin) is the SCAQMD. SCAQMD is responsible for controlling emissions primarily from stationary sources, and maintains air quality monitoring stations throughout the Basin. SCAQMD, in coordination with the Southern California Association of Governments, is also responsible for developing, updating, and implementing the Air Quality Management Plan (AQMP) for the Basin. An AQMP is a plan prepared by an air pollution control district for a county or region designated as a nonattainment area for bringing the area into compliance with the requirements of the national and/or California ambient air quality standards. The term "nonattainment area" is used to refer to an air basin where ambient air quality standards are exceeded. In conjunction with CARB and Southern California Association of Governments (SCAG), SCAQMD prepared the 2007 revisions to its AQMP.

The 2007 AQMP employs up-to-date science and analytical tools and incorporates a comprehensive strategy aimed at controlling pollution from all sources, including stationary sources, on-road and off-road mobile sources, and area sources.

The 2007 AQMP demonstrates attainment with the federal 8-hour ozone standard and for $PM_{2.5}$, replaces the 2003 attainment demonstration for the federal CO standard and maintenance plan for CO for the future; and updates the maintenance plan for the federal NO_2 standard that the Basin has met since 1992.

The 2007 AQMP also addresses several state and federal planning requirements and incorporates significant new scientific data, primarily in the form of updated emissions inventories, ambient measurements, new meteorological episodes, and new air quality modeling tools. The 2007 AQMP is consistent with and builds upon the approaches taken in the 2003 and 1997 AQMP and the 1999 Amendments to the SCAB SIP for the attainment of the federal ozone air quality standard.

Each revision of the AQMP represents a snapshot in time, based on the best available information. Generally, the 2007 AQMP is very similar in structure to the 2003 AQMP, the 1997 AQMP, and the 1999 Amendments to the SIP, but like all new editions it includes significant enhancements. The key updates incorporated in the 2007 AQMP are summarized as follows:

- Revised emissions inventory projections using 2002 as the base year, the CARB on-road motor vehicle emissions model EMFAC2007, and SCAG 2004 Regional Transportation Plan (RTP) forecast assumptions;

- Revised control strategy that updates remaining control measures from the 2003 AQMP, 1997/1999 SIP, and incorporation of new control measures toward attainment of the federal 8-hour ozone and $PM_{2.5}$ standards based on current technology assessments;
- Reliance on updated modeling tools for attainment demonstration relative to ozone,
- PM_{10} and $PM_{2.5}$; and
- Attainment demonstration of the federal 8-hour ozone and $PM_{2.5}$ standards.

The 2007 AQMP employs up-to-date science and analytical tools and incorporates a comprehensive strategy aimed at controlling pollution from all sources, including stationary sources, on-road and off-road mobile sources, and area sources. While many technical tasks are still underway to complete the Plan revision, there is sufficient information to begin framing policy discussions on clean air strategies. Hence, the Draft Plan has been prepared and is being released for early public review and participation.

The 2007 AQMP proposes attainment demonstration of the federal $PM_{2.5}$ standards through a more focused control of SO_x, directly emitted $PM_{2.5}$, and NO_x supplemented with volatile organic compound (VOC) by 2014. The 8-hour ozone control strategy builds upon the $PM_{2.5}$ strategy, augmented with additional VOC reductions to meet the standard by 2020. An extended attainment date (i.e., additional three years) is allowed under the Clean Air Act if a "bump-up" request is made by the state showing the need for such extension.

The 2007 AQMP proposes policies and measures currently contemplated by responsible agencies to achieve federal standards for healthful air quality in the Basin. The 2007 AQMP also addresses several federal planning requirements and incorporates significant new scientific data, primarily in the form of updated emissions inventories, ambient measurements, new meteorological episodes, and new air quality modeling tools.

Local Government

Jurisdiction over the Proposed Alternative Project resides in San Bernardino County. The County of San Bernardino adopted a General Plan in 2007. The General Plan contains the goals, policies, and implementing actions for a variety of issues including natural and man-made hazards and natural and man-made resources; sets the framework for decision-making regarding the County's long-term development and utilization of resources; provides the data and analyses to support that decision-making framework; provides the rules by which land can be developed (what, where, and under what conditions); provides a consensus vision of what the citizens and Board of Supervisors want for the County's future; and establishes the operating rules for achieving that vision. Listed below are policies and programs contained in the General Plan that are pertinent to the protection of air quality.

Land Use Element

- **LU 8.1** – Potentially polluting, hazardous, and other health risk facilities should be located no closer than one-quarter mile to a sensitive receptor and vice versa.
- **LU 8.2** – Review development proposals to minimize impacts, such as air emissions, on sensitive receptors.
- **LU 9.2** – Discourage leap-frog development and urban sprawl by restricting the extension or creation of new urban services or special districts to areas that cannot be sustained in a fiscally responsible manner.

Circulation and Infrastructure Element

- **CI 3.1** – Encourage the reduction of automobile usage through various incentive programs.
- **CI 4.2** – To reduce the dependence on the automobile for local trips, integrate transportation and land use planning at the community and regional levels by promoting transit-oriented development (TOD), where appropriate and feasible.
- **CI 6.1** – Require safe and efficient pedestrian and bicycle facilities in residential, commercial, industrial, and institutional developments to facilitate access to public and private facilities and to reduce vehicular trips. Install bicycle lanes and sidewalks on existing and future roadways, where appropriate and as funding is available.
- **CI 6.3** – Retain residual road dedication that may result whenever a road is changed to a lower highway designation, thus reducing the required right-of-way, until it is determined that such dedication will not be needed for bicycle, pedestrian or equestrian trail purposes.
- **M/CI 1.10** – Support the development of park and ride transit service in the mountain communities.
- **M/CI 1.11** – When population and residential densities permit or warrant, develop shuttle services from residential neighborhoods to recreational areas and major commercial centers.

Housing Element

- **H 2.5** – Continue to evaluate residential developments with emphasis on energy-efficient design and siting options that are responsive to local climatic conditions and applicable laws.
- **H 2.10** – Encourage the use of energy conservation features in residential construction, remodeling, and existing homes.

Conservation Element

- **CO 4.1** – Because developments can add to the wind hazard (due to increased dust, the removal of wind breaks, and other factors), the County will require either as mitigation measures in the appropriate environmental analysis required by the County for the development proposal; or as conditions of approval if no environmental document is required; and that developments in areas identified as susceptible to wind hazards to address site-specific analysis of:

a.) Grading restrictions and/or controls on the basis of soil types, topography, or season.
b.) Landscaping methods, plant varieties, and scheduling to maximize successful revegetation.
c.) Dust-control measures during grading, heavy truck travel, and other dust generating activities.

- **CO 4.2** – Coordinate air quality improvement technologies with the SCAQMD and the Mojave Air Quality Management District (MAQMD) to improve air quality through reductions in pollutants from the region.
- **CO 4.3** – The County will continue to ensure through coordination and cooperation with all airport operators a diverse and efficient ground and air transportation system, which generates the minimum feasible pollutants.
- **CO 4.4** – Because congestion resulting from growth is expected to result in a significant increase in the air quality degradation, the County may manage growth by insuring the timely provision of infrastructure to serve new development.
- **CO 4.5** – Reduce emissions through reduced energy consumption.
- **CO 4.6** – Provide incentives such as preferential parking for alternative-fuel vehicles (e.g., Compressed Natural Gas (CNG) or hydrogen (H_2).
- **CO 4.8** – Replace existing vehicles in the County fleet with the cleanest vehicles commercially available that are cost-effective and meet the vehicle use needs.
- **CO 4.9** – Manage the County's transportation fleet fueling standards to improve the number of alternative fuel vehicles in the County fleet.
- **CO 4.10** – Support the development of alternative fuel infrastructure that is publicly accessible.
- **CO 4.11** – Establish programs for priority or free parking on County streets or in County parking lots for alternative fuel vehicles.
- **CO 4.12** – Provide incentives to promote siting or use of clean air technologies (e.g., fuel cell technologies, renewable energy sources, UV coatings, and hydrogen fuel).
- **CO 8.6** – Fossil fuels combustion contributes to poor air quality. Therefore, alternative energy production and conservation will be required, as follows:

a) New developments will be encouraged to incorporate the most energy-efficient technologies that reduce energy waste by weatherization, insulation, efficient appliances, solar energy systems, reduced energy demand, efficient space cooling and heating, water heating, and electricity generation.
b) All new subdivisions for which a tentative map is required will provide, to the extent feasible, for future natural heating or cooling opportunities in the subdivision. This can be accomplished by design of lot size and configuration for heating or cooling from solar exposure or shade and breezes, respectively.

c) For all new divisions of land for which a tentative map is required, a condition of approval will be the dedication of easements, for the purpose of assuring solar access, across adjacent parcels or units.

- **CO 8.8** – Promote energy-efficient design features, including appropriate site orientation, use of lighter color roofing and building materials, and use of deciduous shade trees and windbreak trees to reduce fuel consumption for heating and cooling.
- **CO 8.9** – Promote the use of automated time clocks or occupant sensors to control central heating and air conditioning.

4.2.3 - Air Pollutants

Criteria air pollutants are those pollutants that have been determined by EPA or CARB to have detrimental health effects for "sensitive" populations such as people with asthma, children, and older adults and for which health criteria have been established. Criteria air pollutants have historically been reported in three main categories – stationary sources, areawide sources, and mobile sources. Stationary sources are those that generate emissions from a stationary location, usually associated with manufacturing and industrial sources. Areawide sources are sources of emissions which are widely distributed and produce many emissions, individually small but collectively significant, such as consumer products, fireplaces, and solvent evaporation. Mobile source emissions are associated with motor vehicles and include on-road and off-road sources. On-road sources are emissions from vehicles, trucks, motorcycles, buses, etc. Off-road sources include equipment and vehicles in the following sectors: recreational, construction, mining, industrial, lawn and garden, farm, airport service, and rail. A brief summary of most recognized pollutants of concern follows:

- Carbon Monoxide (CO): A colorless, odorless toxic gas produced by incomplete combustion of carbon-containing fuels (e.g., gasoline or diesel fuel). CO levels tend to be highest during the winter months, when the meteorological conditions favor the accumulation of the pollutants.
- Ozone: A photochemical oxidant that is formed when reactive organic gases and oxides of nitrogen (both byproducts of internal combustion engines) react in the presence of ultraviolet sunlight. Ozone is a very energetic combination of three oxygen atoms that, when it comes into contact with a surface, releases its force as chemical energy. When this happens to biological systems (i.e., the respiratory tract and plants), this energy can cause damage to sensitive tissues.
- Oxides of nitrogen (NO_x): NO_x is a mixture of nitric oxide and nitrogen dioxide in the atmosphere. Nitric oxide is from a byproduct of fuel combustion and quickly reacts with oxygen to form nitrogen dioxide. NO_x emissions contribute to the formation of ozone and particulate matter. The only form of NO_x that exists at a level to cause public health concerns is nitrogen dioxide.
- Sulfur dioxide and sulfates: In California, sulfur is emitted during the combustion of petroleum-derived fuels (i.e., gasoline and diesel fuel) that contain sulfur. During combustion,

sulfur is oxidized to sulfur dioxide (a colorless pungent gas). The sulfur dioxide is then converted to sulfate compounds in the atmosphere.

- Lead: Lead is a heavy metal that can accumulate in bone, soft tissue, and blood and can damage the kidneys, liver, and nervous system, and can result in learning disabilities, seizures, and death. Lead concentrations once exceeded the state and national air quality standards by a wide margin, but have not exceeded state or national air quality standards in the area for at least 10 years. Lead is no longer an additive in gasoline, which is the main reason the concentration of lead in the air is low.
- Suspended PM_{10} and $PM_{2.5}$: Particulate matter is a mixture of small particles that consists of dry solid fragments, droplets of water, or solid cores with liquid coatings. The particles vary in shape, size, and composition. PM_{10} refers to particulate matter that is 10 microns or less in diameter (1 micron is one-millionth of a meter). $PM_{2.5}$ refers to particulate matter that is 2.5 microns or less in diameter. Sources include road dust, diesel soot, erosion of soil, combustion particles (ashes and soot), and tire and brake abrasion.
- Volatile organic compounds (VOCs): VOCs are organic compounds that readily evaporate. Reactive organic gases (ROGs) consist of nonmethane and oxygenated hydrocarbons. Although all VOCs are not necessarily ROGs, the terms are often interchanged. There are no state or national ambient air quality standards for VOCs; however, they are regulated because they are involved in chemical reactions that contribute to the formation of ozone. In addition, some hydrocarbon components classified as VOCs (i.e., benzene) are thought or known to be hazardous. Sources of VOCs include adhesives, solvents, paints, cooking, fuel, and combustion. VOC can interfere with oxygen uptake and can cause coughing, sneezing, headaches, weakness, laryngitis, and bronchitis.
- Diesel particulate matter (DPM): A subset of particulate matter that is a matter of concern is DPM. Diesel exhaust is a mixture of many particles and gases that is produced when an engine burns diesel fuel. Many compounds found in diesel exhaust are carcinogenic, including sixteen that are classified as possibly carcinogenic by the International Agency for Research on Cancer. DPM includes the particle-phase particles in diesel exhaust. Components of DPM include elemental and organic carbon. Elemental carbon is carbon that has had hydrogen taken from it. Organic carbon contains molecules containing carbon and hydrogen, and can also contain oxygen, sulfur, and nitrogen. Exposure to diesel exhaust can cause immediate health effects. Some of the health effects include eye, nose, and throat irritation as well as cough, nausea, and phlegm. The elderly, children, people with allergies, and those with asthma, emphysema, and chronic heart and lung disease are more susceptible to the effects of diesel exhaust is a mixture of many particles and gases that is produced when an engine burns diesel fuel. Many compounds found in diesel exhaust are carcinogenic. DPM includes the particle-phase particles in diesel exhaust. Some of the health effects of DPM include eye, nose, and throat irritation as well as cough, nausea, and phlegm.

- GHGs: Certain atmospheric gases act as an insulating blanket for solar energy to keep the global average temperature in a suitable range, and help to regulate the climate by absorbing infrared radiation in the atmosphere and allowing incoming solar radiation to pass through the atmosphere. These gases are called "greenhouse gases" (GHGs) because they trap heat like the glass walls of a greenhouse. Some GHGs include water vapor, methane, carbon dioxide (CO_2), nitrous oxide, ozone, halogenated fluorocarbons, perfluorinated carbons, and hydrofluorocarbons. The most common GHG is CO_2, which constitutes approximately 84 percent of all GHG emissions in California (CEC, 2006).
    - Water vapor (H_20) is the most abundant, important, and variable GHG in the atmosphere. Water vapor is not considered a pollutant; in the atmosphere it maintains a climate necessary for life. Changes in its concentration are primarily considered to be a result of climate feedbacks related to the warming of the atmosphere rather than a direct result of industrialization. The feedback loop in which water is involved is critically important to projecting future climate change. As the temperature of the atmosphere rises, more water is evaporated from ground storage (rivers, oceans, reservoirs, soil). Because the air is warmer, the relative humidity can be higher (in essence, the air is able to 'hold' more water when it is warmer), leading to more water vapor in the atmosphere. As a GHG, the higher concentration of water vapor is then able to absorb more thermal indirect energy radiated from the Earth, thus further warming the atmosphere. The warmer atmosphere can then hold more water vapor and so on and so on. This is referred to as a "positive feedback loop." The extent to which this positive feedback loop will continue is unknown as there are also dynamics that hold the positive feedback loop in check. As an example, when water vapor increases in the atmosphere, more of it will eventually also condense into clouds, which are more able to reflect incoming solar radiation (thus allowing less energy to reach the Earth's surface and heat it up). There are no health effects from water vapor itself; however, when some pollutants come in contact with water vapor, they can dissolve and the water vapor can then act as a pollutant-carrying agent. The main source of water vapor is evaporation from the oceans (approximately 85 percent). Other sources include: evaporation from other water bodies, sublimation (change from solid to gas) from sea ice and snow, and transpiration from plant leaves.
    - Carbon dioxide (CO_2) is an odorless and colorless GHG. Outdoor levels of carbon dioxide are not high enough to result in negative health effects. Carbon dioxide is emitted from natural and manmade sources. Natural sources include the decomposition of dead organic matter; respiration of bacteria, plants, animals and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources include the burning of coal, oil, natural gas, and wood. Carbon dioxide is naturally removed from the air by photosynthesis, dissolution into ocean water, transfer to soils and ice caps, and chemical weathering of carbonate rocks. Since the industrial revolution began in the mid-1700s, the sort of human activity that increases GHG emissions has increased dramatically in

scale and distribution. Data from the past 50 years suggests a corollary increase in levels and concentrations. As an example, prior to the industrial revolution, CO concentrations were fairly stable at 280 parts per million (ppm). Today, they are around 370 ppm, an increase of more than 30 percent. Left unchecked, the concentration of carbon dioxide in the atmosphere is projected to increase to a minimum of 540 ppm by 2100 as a direct result of anthropogenic sources.

- Methane (CH_4) is an extremely effective absorber of radiation, though its atmospheric concentration is less than carbon dioxide and its lifetime in the atmosphere is brief (10-12 years), compared to other GHGs. No health effects are known to occur from exposure to methane. Methane has both natural and anthropogenic sources. It is released as part of the biological processes in low oxygen environments, such as in swamplands or in rice production (at the roots of the plants). Over the last 50 years, human activities such as growing rice, raising cattle, using natural gas, and mining coal have added to the atmospheric concentration of methane. Other anthropocentric sources include fossil fuel combustion and biomass burning.
- Nitrous oxide (N_2O), also known as laughing gas, is a colorless GHG. Nitrous oxide can cause dizziness, euphoria, and sometimes slight hallucinations. In small doses, it is considered harmless. However, in some cases, heavy and extended use can cause Olney's Lesions (brain damage). Concentrations of nitrous oxide also began to rise at the beginning of the industrial revolution. In 1998, the global concentration was 314 parts per billion (ppb). Nitrous oxide is produced by microbial processes in soil and water, including those reactions, which occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load. It is used as an aerosol spray propellant (i.e., in whipped cream bottles). It is also used in potato chip bags to keep chips fresh. It is used in rocket engines and in race cars. Nitrous oxide can be transported into the stratosphere, be deposited on the earth's surface, and be converted to other compounds by chemical reaction.
- Chlorofluorocarbons (CFCs) are gases formed synthetically by replacing all hydrogen atoms in methane or ethane (C_2H_6) with chlorine and/or fluorine atoms. CFCs are nontoxic, nonflammable, insoluble and chemically unreactive in the troposphere (the level of air at the earth's surface). CFCs are no longer being used; therefore, it is not likely that health effects would be experienced. Nonetheless, in confined indoor locations, working with CFC-113 or other CFCs is thought to result in death by cardiac arrhythmia (heart frequency too high or too low) or asphyxiation. CFCs have no natural source, but were first synthesized in 1928. They were used for refrigerants, aerosol propellants and cleaning solvents. Due to the discovery that they are able to destroy stratospheric ozone, a global effort to halt their production was undertaken and was extremely successful, so much so that levels of the major CFCs are now remaining steady

or declining. However, their long atmospheric lifetimes mean that some of the CFCs will remain in the atmosphere for over 100 years.

- Hydrofluorocarbons (HFCs) are synthetic, man-made chemicals that are used as a substitute for CFCs. Out of all the GHGs, they are one of three groups with the highest global warming potential. The HFCs with the largest measured atmospheric abundances are (in order), HFC-23 (CHF_3), HFC-134a (CF_3CH_2F), and HFC-152a (CH_3CHF_2). Prior to 1990, the only significant emissions were of HFC-23. HFC-134a emissions are increasing due to its use as a refrigerant. The U.S. EPA estimates that concentrations of HFC-23 and HFC-134a are now about 10 parts per trillion (ppt) each; and that concentrations of HFC-152a are about 1 ppt. No health effects are known to result from exposure to HFCs, which are manmade for applications such as automobile air conditioners and refrigerants.
- Perfluorocarbons (PFCs) have stable molecular structures and do not break down though chemical processes in the lower atmosphere. High-energy ultraviolet rays, which occur about 60 kilometers above Earth's surface, are able to destroy the compounds. Because of this, PFCs have very long lifetimes, between 10,000 and 50,000 years. Two common PFCs are tetrafluoromethane (CF_4) and hexafluoroethane (C_2F_6). The U.S. EPA estimates that concentrations of CF_4 in the atmosphere are over 70 ppt. No health effects are known to result from exposure to PFCs. The two main sources of PFCs are primary aluminum production and semiconductor manufacture.

- Visibility reducing particles: Visibility reducing particles are suspended particulate matter. Visibility is the distance through the air that can be seen without the use of instrumental assistance. The 8-hour state standard is the extinction coefficient of 0.23 kilometer – visibility of 10 miles or more due to particles when relative humidity is less than 70 percent. Visibility reducing particles are not assessed in this report; however, particulate matter is assessed.

- Vinyl chloride: Vinyl chloride is a chlorinated hydrocarbon and a colorless gas with a mild, sweet odor. Most vinyl chloride is used to make polyvinyl chloride (PVC) plastic and vinyl products. Vinyl chloride is a known carcinogen. The 24-hour state standard for vinyl chloride is 0.01 ppm. The proposed project is not expected to generate or be exposed to vinyl chloride because its uses do not include the chemicals processes that create this pollutant. Therefore, it is not assessed in this report.

- Hydrogen sulfide: Hydrogen sulfide is a flammable, colorless, poisonous gas that smells like rotten eggs. It can irritate the eyes and respiratory tract and cause symptoms like headache, nausea, vomiting, and cough. The 1-hour state standard for hydrogen sulfide is 0.03 ppm. Sources include the combustion of sulfur containing fuels (oil and coal) and organic matter that undergoes putrefaction. It is used in the production of heavy water for nuclear reactors, the manufacture of chemicals, in metallurgy, and as an analytical reagent. The proposed project is

not expected to cause exposure to hydrogen sulfide because it will not generate hydrogen sulfide in any substantial quantity. Therefore, hydrogen sulfide is not assessed in this analysis.

4.2.4 - Physical Setting

Local Climate

Ambient Air Quality Standards

The national and state standards are the levels of air quality considered safe, with an adequate margin of safety, to protect the public health and welfare. The health effects of a pollutant are a factor of the dose of the pollutant, the length of exposure, the pollutant's properties, and the body's ability to excrete the pollutant. Table 4.2-1 refers to the current national and state standards, as well as the relevant health effects.

Local Climate

As previously stated, the Proposed Alternative Project is located near the community of Fawnskin, on the north shore of Big Bear Lake in San Bernardino County. This region is located within the Basin. Regional and local air quality is impacted by dominant airflows, topography, atmospheric inversions, location, season, and time of day.

The presence and intensity of sunlight are necessary prerequisites for the formation of ozone. Under the influence of the ultraviolet radiation of sunlight, certain primary pollutants (mainly VOC and NO_X) react to form a secondary pollutant – ozone. Since this process is time dependent, ozone can be formed many miles downwind from the emission sources. Because of the prevailing daytime winds and time-delayed nature of ozone, concentrations are highest in the inland areas of Southern California. However, a majority of the smog in the Big Bear Valley is created by the transport of pollutants from Los Angeles, Riverside, and San Bernardino counties, as opposed to local sources.

The climate in the Basin is characterized by moderate temperatures and comfortable humidity with precipitation generally limited to a few storms during the winter season (November through April). The average annual temperature varies little throughout the Basin, averaging 75 degrees Fahrenheit (ºF). More specifically, the Community of Fawnskin enjoys an Alpine climate. The Community is located in an area that intercepts water-laden clouds that can result in rainfall and/or snow. Precipitation at Big Bear Lake's National Weather Service station from 1960 to 2006 averaged about 18 inches for the six-month period from November to April and the average snowfall for January, February, and March is above 14 inches per month. The area's watershed is mountainous with steep upper slopes leading to a mildly sloping valley. The coolest month of the year is January, with a mean monthly temperature of 33.7 ºF. The warmest month is July, with a mean monthly temperature of 63.9 ºF.

Dominant airflows provide the driving mechanism for transport and dispersion of air pollution. The mountains surrounding the Los Angeles region form natural horizontal barriers to the dispersion of air contaminants. Air pollution created in the coastal areas and around the Los Angeles area is

transported inland until it reaches the mountains where the combination of mountains and inversion layers generally prevent further dispersion. The area in which the Community of Fawnskin is located offers approximately 300 days/year of clear skies and sunshine and is above the typical inversion altitudes of the Los Angeles area; however, it is still susceptible to air inversions. This traps a layer of stagnant air near the ground where it is further loaded with pollutants. These inversions cause haziness, which is caused by moisture, suspended dust, and a variety of chemical aerosols emitted by trucks, automobiles, wood stoves, and other sources.

Local Air Quality

The local air quality can be evaluated by reviewing relevant air pollution concentrations near the project area. SCAQMD has divided the basin into 38 Source Receptor Areas (SRA) for evaluation purposes and operates monitoring stations within each one. Existing levels of ambient air quality and historical trends and projections of air quality in the project area are best documented from measurements made near the project site. SCAQMD operates an air monitoring station in Big Bear City, approximately 4 miles east of the project, but it only measures $PM_{2.5}$. The nearest site that measures PM_{10}, which is operated by the MDAQMD, is located approximately 10 miles north of the project in Lucerne Valley at the Middle School. The nearest ozone monitor is operated by the SCAQMD located at Lake Gregory – Crestline, approximately 20 miles west of the project site. Table 4.2-2 summarizes 2004-2006 published monitoring data for the nearest monitors. The SCAQMD and CARB have decided that the only pollutant of concern enough to be monitored in the area where the project is located is $PM_{2.5}$. PM_{10} and ozone monitoring information are supplied for informational purposes but may not represent accurate localized conditions of the project site.

Table 4.2-2: San Bernardino Mtn. Air Quality Monitoring Summary

Air Pollutant, Averaging Time (Units)	2004	2005	2006
Ozone - Crestline			
Max 1 Hour (ppm)	0.163	0.182	0.164
Days > CAAQS (0.09 ppm)	75	80	73
Days > NAAQS (0.12 ppm)*	9	18	–
Max 8 Hour (ppm)	0.145	0.145	0.142
Days > CAAQS (0.070 ppm)*	–	119	103
Days > NAAQS (0.08 ppm)	66	69	59
Particulate Matter (PM_{10}) – Lucerne Valley			
Mean ($\mu g/m^3$)	18.1	19.1	23.0
24 Hour ($\mu g/m^3$)	47	57	50
Days > CAAQS (50 $\mu g/m^3$)	0	1	0
Days > NAAQS (150 $\mu g/m^3$)	0	0	0
Particulate Matter ($PM_{2.5}$) – Big Bear City			
Mean ($\mu g/m^3$)	NA	NA	NA
24 Hour ($\mu g/m^3$)	28.6	38.7	40.0
Days > NAAQS (35 $\mu g/m^3$)	0	0	0

Table 4.2-2 (cont.): San Bernardino Mtn. Air Quality Monitoring Summary

Air Pollutant, Averaging Time (Units)	2004	2005	2006
Abbreviations: > = exceed ppm = parts per million $\mu g/m^3$ = micrograms per cubic meter NA = not available max = maximum Mean = Annual Arithmetic Mean CAAQS = California Ambient Air Quality Standard NAAQS = National Ambient Air Quality Standard Note: NAAQS for 1-hour ozone and the CAAQS for 8-hour are presented for the years the standards were in effect Source: CARB Air Quality Data/Statistics/Top 4 Summary, 6/1/2007.			

Local Sources of Air Pollutants

The project area is primarily a resort area with recreational activities for all four seasons. The primary source of local pollution is vehicular in both summer and winter, with the addition of wood smoke during the winter. Recreational boating is also a CO and VOC source.

Rules Applicable to the Proposed Alternative Project

The rules and regulations that apply to this project include but are not limited to the following:

- SCAQMD Rule 403, which governs emissions of fugitive dust. Compliance with this rule is achieved through application of standard best management practices in construction and operation activities, such as application of water or chemical stabilizers to disturbed soils, covering haul vehicles, restricting vehicle speeds on unpaved roads to 15 miles per hour (mph), sweeping loose dirt from paved site access roadways, cessation of construction activity when winds exceed 25 mph and establishing a permanent, stabilizing ground cover on finished sites.

- SCAQMD Rule 1108 governs the sale, use, and manufacturing of asphalt and limits the ROG content in asphalt used in the South Coast Air Basin. Although this rule does not directly apply to the Proposed Alternative Project, it does dictate the ROG content of asphalt available for use during the construction.

- SCAQMD Rule 1113 governs the sale, use, and manufacturing of architectural coating and limits the ROG content in paints and paint solvents. Although this rule does not directly apply to the Proposed Alternative Project, it does dictate the ROG content of paints available for use during the construction of buildings.

- SCAQMD Rule 402 governs the discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.

Alternate Forms of Transportation

The Mountain Area Regional Transit Authority (MARTA) is the primary public transportation provider on the mountaintop, providing local and off-the-mountain bus service to the Big Bear Valley, Running Springs, Lake Arrowhead, Crestline, and San Bernardino. The agency operates both fixed route and demand-response services (Dial-A-Ride). MARTA has connecting services to Metrolink, Omnitrans, and Greyhound.

Attainment Status

Air basins where ambient air quality standards are exceeded are referred to as "nonattainment" areas. If standards are met, the area is designated as an "attainment" area. If there is inadequate or inconclusive data to make a definitive attainment designation, they are considered "unclassified." National nonattainment areas are classified as severe, serious, or moderate as a function of deviation from standards.

The current attainment designations for the project area are shown in Table 4.2-3. The "attainment year" is the goal of the existing 2003 AQMP and 2007 AQMP. The basin is in state non-attainment for ozone, PM_{10}, and $PM_{2.5}$, and is in federal nonattainment for ozone, CO, PM_{10}, and $PM_{2.5}$. Note that CO is still classified as "serious nonattainment" for the federal CO standard even though the attainment date has passed and the basin met the CO standard by December 2002. In 2004, SCAQMD requested that EPA re-designate the basin as in attainment with the CO ambient air quality standard, but EPA has not made a formal action to do so. The 2003 AQMP served as a maintenance plan for CO, and the 2007 AQMP is an update to that maintenance plan.

Table 4.2-3: SCAB Attainment Status

Pollutant	State Status	National Status [Attainment Year]
Ozone (1-hour)	Non-attainment	Not Subject
Ozone (8-hour)	Non-attainment	Severe Non-attainment [2021]
Carbon Monoxide	Attainment	Serious Non-attainment [2000]
Nitrogen Dioxide	Attainment	Attainment
Sulfur Dioxide	Attainment	Attainment
PM_{10}	Non-attainment	Serious Non-attainment [2006]
$PM_{2.5}$	Non-attainment	Non-attainment [2015]
Source: State Status from CARB, 2006. National Status from U.S. EPA, 2007.		

4.2.5 - Global Climate Change

Gases that trap heat in the atmosphere are called GHGs. The greenhouse effect is analogous to the way a greenhouse retains heat, and raises the temperature of the earth's surface by about 60 ºF. With the natural greenhouse effect, the average temperature of the earth is about 45 ºF; without it, the earth

would be about -15 ºF. Global warming is an average rise in the earth's temperature, which can cause changes in climate. It is normal for the earth's temperature to fluctuate over extended periods of time. Over the past one hundred years, however, the earth's average global temperature has generally increased by 1 ºF. Scientists refer to the global warming context of the past century as the "enhanced greenhouse effect" to distinguish it from the natural greenhouse effect. While the increase in temperature is known as "global warming", the resulting change in weather patterns is known as "global climate change." Global climate change is evidenced in changes to wind patterns, storms, precipitation, and air temperature. Historical records have shown that temperature changes have occurred in the past, such as during previous ice ages, but some data indicates that the current temperature record differs from previous climate changes in rate and magnitude.

Common GHGs include water vapor, carbon dioxide, methane, nitrous oxides, chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Both natural processes and human activities emit GHGs. However, it is believed that emissions from human activities, such as electricity production and vehicle exhaust, have elevated the concentration of these gases in the atmosphere, leading to a trend of unnatural warming of the Earth's climate, known as global warming or climate change.

The United Nations Intergovernmental Panel on Climate Change (IPCC) constructed several emission trajectories of GHGs needed to stabilize global temperatures and climate change impacts. It concluded that a stabilization of GHGs at 400-450 ppm carbon dioxide-equivalent concentration is required to keep global mean warming below 2 degrees Celsius, which is assumed to be necessary to avoid dangerous climate change (IPCC 2001).

The State of California is a substantial contributor of global GHGs as it is the second largest contributor in the U.S. and the sixteenth largest in the world (CEC 2006). The California Energy Commission calculated that in 2004 California produced 492 million metric tons of carbon dioxide equivalent (CEC 2006).

An individual project cannot generate enough GHG emissions to effect a discernible change in global climate. However, the Proposed Alternative Project may participate in this potential impact by its incremental contribution combined with the cumulative increase of all other sources of GHGs, which when taken together constitute potential influences on global climate change. Because these changes may have serious environmental consequences, this section will evaluate the potential for the Proposed Alternative Project to have a significant effect upon California's environment as a result of its potential contribution to the enhanced greenhouse effect.

Federal Regulation

In the past, the U.S. EPA has not regulated GHGs under the Clean Air Act because it asserted that the Act did not authorize it to issue mandatory regulations to address global climate change and that such regulation would be unwise without an unequivocally established causal link between GHGs and the

increase in global surface air temperatures. However, the U.S. Supreme Court recently held that the EPA must consider regulation of motor-vehicle GHG emissions. In *Massachusetts v. Environmental Protection Agency et al.,* twelve states and cities, including California, together with several environmental organizations, sued to require the EPA to regulate GHGs as pollutants under the Clean Air Act (127 S. Ct. 1438 (2007). The Court ruled that GHGs fit within the Clean Air Act's definition of a pollutant and that the EPA did not have a valid rationale for not regulating GHGs. Despite the Court's ruling, to date the EPA has not promulgated regulations on GHG emissions; however, Congress is currently working on legislation that would address GHGs.

State Regulation

There has been significant legislative activity regarding global climate change and GHGs in California. California Assembly Bill 1493 (Pavley), enacted on July 22, 2002, required the ARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light duty trucks. Regulations adopted by the ARB would apply to 2009 and later model year vehicles. The ARB estimates that the regulation would reduce climate change emissions from the light-duty passenger vehicle fleet by an estimated 18 percent in 2020 and by 27 percent in 2030.

Executive Order S-3-05

California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S 3-05, the following GHG emission reduction targets:

1. By 2010, reduce GHG emissions to 2000 levels;
2. By 2020, reduce GHG emissions to 1990 levels; and
3. By 2050, reduce GHG emissions to 80 percent below 1990 levels.

Climate Action Team

To meet these targets, the Governor directed the Secretary of the Cal EPA to lead a Climate Action Team (CAT) made up of representatives from the Business, Transportation and Housing Agency; the Department of Food and Agriculture; the Resources Agency; the Air Resources Board; the Energy Commission; and the Public Utilities Commission. The CAT's Report to the Governor in 2006 (2006 CAT Report) contains recommendations and strategies to help ensure the targets in Executive Order S-3-05 are met.

AB 32

In 2006, the California State Legislature adopted AB 32, the California Global Warming Solutions Act of 2006. In adopting this legislation (commonly known as AB 32), the State initiated a long-term program for the development of GHG emissions reduction measures. AB 32 focuses on reducing GHG emissions in California and requires that GHGs emitted in California be reduced to 1990 levels by the year 2020. GHGs, as defined under AB 32, include carbon dioxide, methane, nitrous oxide, HFCs, PFCs, and SF_6. The ARB is the state agency charged with monitoring and regulating sources of emissions of GHGs that cause global warming in order to reduce emissions of

GHGs. AB 32 required ARB to determine what, the statewide GHG emissions level was in 1990 and approve a statewide GHG emissions limit by January 1, 2008, so it may be applied to the 2020 benchmark. Currently, GHG levels have been estimated at 600 MMTs of CO_2 equivalent, while 1990 levels have been estimated to be 427 MMTs. Accordingly, emissions need to be reduced by 173 MMTs by 2020.

On December 11, 2008, CARB adopted a scoping plan to reduce GHG emissions to 1990 levels. The Scoping Plan's recommendations for reducing GHG emissions to 1990 levels by 2020 include emission reduction measures, including a cap-and-trade program linked to Western Climate Initiative partner jurisdictions, green building strategies, recycling and waste-related measures, as well as Voluntary Early Actions and Reductions. CARB has until January 1, 2011, to adopt the necessary regulations to implement that plan. Implementation of individual measures must begin no later than January 1, 2012, so that the emissions reduction target can be fully achieved by 2020. CARB is currently drafting regulations to implement the plan.

SB 97

AB 32, however, did not amend CEQA or establish regulatory standards to be applied to new development or environmental review of projects within the state. Accordingly, the Legislature adopted Senate Bill 97 (SB 97) in August 2007. SB 97 requires the California Office of Planning and Research (OPR) to prepare and transmit new CEQA guidelines for the mitigation of GHG emissions or the effects of GHG emissions to the Resources Agency by July 1, 2009. These guidelines for mitigation must address, but are not limited to, GHG emissions and effects associated with transportation and energy consumption. Following receipt of these guidelines, the Resources Agency must certify and adopt the guidelines prepared by OPR by January 1, 2010.

OPR

OPR released preliminary draft CEQA Guideline amendments for GHG emissions on January 8, 2009, and submitted its final proposed guidelines to the Secretary for Natural Resources on April 13, 2009. Of note, the final proposed guidelines state that a lead agency shall have discretion to determine whether to use a quantitative model or methodology, or in the alternative, rely on a qualitative analysis or performance based standards. Proposed CEQA Guideline § 15064.4(a) "A lead agency shall have discretion to determine, in the context of a particular project, whether to: (1) use a model or methodology to quantify GHG emissions resulting from a project, and which methodology to use; or (2) rely on a qualitative analysis or performance based standards."

In its draft CEQA Guideline amendments, OPR does not identify a threshold of significance for GHG emissions, nor does it prescribe assessment methodologies or specific mitigation measures. Instead, it calls for a "good-faith effort, based on available information, to describe, calculate or estimate the amount of GHG emissions resulting from a project." The draft amendments encourage lead agencies to consider many factors in performing a CEQA analysis and preserve lead agencies' discretion to make their own determinations based upon substantial evidence. The draft amendments also

encourage public agencies to make use of programmatic mitigation plans and programs from which to tier when they perform individual project analyses.

The Natural Resources Agency will begin a formal rulemaking process to certify and adopt the amendments as part of the state regulations implementing CEQA. Consistent with SB 97, the Natural Resources Agency should complete this process by January 2010. Until these Guidelines are approved, OPR's June 2008 Technical Advisory provides interim advice to lead agencies regarding the analysis of GHG emissions in environmental documents. The Technical Advisory encourages lead agencies to follow three basic steps: (1) identify and quantify the GHG emissions that could result from the proposed project; (2) analyze the effects of those emissions and determine whether the effect is significant, and (3) if the impact is significant, identify feasible mitigation measures or alternatives that will reduce the impact below a level of significance.

CARB's Preliminary Draft Staff Proposal for Interim Significance Thresholds

Although OPR was tasked with updating the CEQA guidelines for GHGs, OPR asked CARB in its Technical Advisory to recommend GHG-related CEQA significance thresholds to assist lead agencies in their significance determination. CARB Staff released a draft proposal on October 24, 2008, with interim guidance on significance thresholds. In its proposal, Staff noted that non-zero thresholds can be supported by substantial evidence, but thresholds should nonetheless be sufficiently stringent to meet the State's interim (2020) and long-term (2050) emissions reduction targets. CARB staff believes that zero thresholds are not mandated in light of fact that: (1) some level of emissions in the near-term and mid-century is still consistent with climate stabilization, and (2) current and anticipated regulations apart from CEQA will proliferate and increasingly will reduce GHG contributions of past, present and future projects. The CARB proposal takes different approaches for different sectors – (1) industrial projects and (2) residential and commercial projects.

CARB Staff has proposed a numerical threshold for the GHG emissions of industrial projects of 7,000 metric tons per year, which is intended to require some form of mitigation from 90 percent of all projects; however, no numerical threshold has been proposed for commercial (and residential) projects. For residential and commercial projects, CARB Staff recommends that if a project complies with a previously approved plan that addresses GHG emissions, it would not have a cumulatively considerable incremental contribution to impacts identified in the previously approved plan, and has a number of specific attributes related to meeting and monitoring GHG targets, then it will not be considered to have significant GHG emissions. Alternatively, if those standards cannot be met, Staff recommends a threshold based on implementation of performance standards, or equivalent mitigation measures, addressing energy use, transportation, water use, waste and construction.

The draft proposal has been very controversial and Staff will be bringing a revised draft to the Board in the future. A key preliminary conclusion from the draft thresholds, however, is that CARB Staff, in setting a numerical threshold for industrial projects and suggesting performance standards, does not believe a "zero threshold" is mandated by CEQA. Similarly, SCAQMD staff, in proposing interim

industrial thresholds, explicitly stated in a December 5, 2008, report that a zero threshold would not be feasible to implement.

SCAQMD

The SCAQMD is currently in the process of developing a threshold of significance for GHG emissions. Although the SCAQMD threshold would technically only apply to projects for which SCAQMD was acting as a CEQA lead agency, the proposed threshold methodology is nonetheless instructive, and is based on a "Tiered Decision Tree" approach based on the concept of business-as-usual (BAU). This approach contains a series of tiers to evaluate a project, starting with exemptions (Tier 1), continuing through consistency with regional plan GHG budgets (Tier 2), quantitative screening level threshold (Tier 3), performance standards (Tier 4), to application of emission offsets (Tier 5).

The SCAQMD's GHG CEQA Significance Thresholds Working Group released a draft threshold methodology in August 2008 (SCAQMD 2008b), and the most recent screening level proposed by staff was 6,500 metric tons of CO_2 equivalent per year (6,500 MT/year CO2). This screening level was derived using the SCAQMD's existing NO_x operational threshold as a basis. The daily NO_x operational significance threshold, 55 pounds per day was annualized, which results in 10 tons of NO_x per year. Projects with GHG emissions less than the screening level are considered to be small projects, that is, they would not likely emit amounts of GHGs to be considered significant pursuant to CEQA.

Senate Bill 375

In September of 2008, the California legislature adopted SB 375, legislation which: (1) relaxes CEQA requirements for some housing projects that meet goals for reducing greenhouse-gas emissions and (2) requires the regional governing bodies in each of the state's major metropolitan areas to adopt, as part of their regional transportation plan, "sustainable community strategies" that will meet the region's target for reducing GHG emissions. SB 375 creates incentives for implementing the sustainable community strategies by allocating federal transportation funds only to projects that are consistent with the emissions reductions. SB 375 also directs CARB to develop regional GHG emission reduction targets to be achieved from the automobile and light truck sectors for 2020 and 2035.

CARB will determine the level of emissions produced by cars and light trucks, including S.U.V.s, in each of California's 17 metropolitan planning areas. Emissions-reduction goals for 2020 and 2035 would be assigned to each area. CARB appointed a Regional Targets Advisory Committee (RTAC) on January 23, 2009 to provide recommendations on factors to consider and methodologies to use in this target setting process. RTAC must provide recommendations to CARB by September 30, 2009, whereupon CARB must propose draft targets by June 10, 2010 and adopt final targets by September 30, 2010.

Local governments would then devise strategies for housing development, road building and other land uses to shorten travel distances, reduce driving and meet the new targets. If regions develop these integrated land use, housing, and transportation plans, residential projects that conform to the sustainable community strategy (and therefore contribute to GHG reduction) can have a more streamlined environmental review process.

California Air Pollution Control Officers Association White Paper

The California Air Pollution Control Officers Association (CAPCOA) released a white paper in January 2008 entitled "CEQA & Climate Change," which discussed three alternative thresholds, including a no significance threshold, a zero increase threshold, and a non-zero threshold, as well as multiple analysis options. The white paper is a resource guide developed to support local governments, and details tools for GHG assessment, emission models, and mitigation strategies to reduce potentially significant GHG emissions from a project.

Local Public Agencies

The California Attorney General sued San Bernardino County based on the County's General Plan Update EIR. That case resulted in a settlement agreement between the County and the California Attorney General's office, filed with the Central District Superior Court of San Bernardino County on August 28, 2007. Under the settlement agreement, the County agreed to prepare an amendment to the General Plan to add a policy that describes the County's goal of reducing GHG attributable to the County's discretionary land use decisions and internal government operations. The County also agreed to prepare a GHG Emissions Reduction Plan. The settlement agreement details the contents of the GHG Emission Reduction Plan, including GHG inventories and emission reduction targets. Both the General Plan amendment and the GHG Emission Reduction Plan should be completed within 30 months of the execution of the settlement agreement. The settlement agreement also contains provisions for diesel engine exhaust control measures to be implemented by the County.

Greenhouse Gases

Potential Environmental Effects

Worldwide, average temperatures are likely to increase by 1.8 degrees Celsius (°C) to 4°C, or approximately 3 °F to 7 °F, by the end of the 21st Century (IPCC 2007a). However, a global temperature increase does not translate to a uniform increase in temperature in all locations on the earth. Regional climate changes are dependant on multiple variables, such as topography. One region of the Earth may experience increased temperature, increased incidents of drought and similar warming effects, whereas another region may experience a relative cooling. According to the IPCC's Working Group II Report, Climate Change impacts to North America may include (IPCC 2007b): diminishing snowpack; increasing evaporation; exacerbated shoreline erosion; exacerbated inundation from sea level rising; increased risk and frequency of wildfire; increased risk of insect outbreaks; increased experiences of heat waves; and, rearrangement of ecosystems, as species and ecosystem zones shift northward and to higher elevations.

For California, Climate Change has the potential to incur/exacerbate the following environmental impacts (CAT 2006):

- Increased frequency, duration, and intensity of conditions conducive to air pollution formation (particularly ozone);
- Reduced precipitation;
- Changes to precipitation and runoff patterns;
- Reduced snowfall (precipitation occurring as rain instead of snow);
- Earlier snowmelt;
- Decreased snowpack;
- Increased agricultural demand for water;
- Intrusion of seawater into coastal aquifers;
- Increased agricultural growing season;
- Increased growth rates of weeds, insect pests and pathogens;
- Inundation of low-lying coastal areas by sea level rise;
- Increased incidents and severity of wildfire events; and,
- Expansion of the range and increased frequency of pest outbreaks.

Although certain environmental effects are widely accepted to be a potential hazard to certain locations, such as rising sea level for low-laying coastal areas, it is currently infeasible to predict all environmental effects of climate change on any one location.

4.2.6 - Thresholds of Significance

The following significance thresholds were derived from Appendix G of the CEQA Guidelines. A significant impact would occur if the proposed project would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or protected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Contribute to a significant global climate change impact by conflicting with GHG emission reduction strategies.
- Expose sensitive receptors to substantial pollutant concentrations;
- Create objectionable odors affecting a substantial number of people; or
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone).

While the formulation of the thresholds of significance is within the purview of the lead agency pursuant to §15064(b) of the State CEQA Guidelines, the SCAQMD recommends that the following quantitative air pollution thresholds be used by the lead agencies in determining whether the proposed project could result in a significant impact. If the lead agency finds that a proposed project has the potential to exceed these air pollution thresholds, the project should be considered significant. These thresholds have been defined by SCAQMD for the SCAB based on scientific data the SCAQMD has obtained and factual data within the federal and state Clean Air Acts. Since the Proposed Alternative Project is located within the SCAB and current air quality in the project area is typical of the air basin as a whole, and because the SCAQMD is the regulatory agency that has authority over air quality regulations and has special knowledge in this regard, the thresholds set by the SCAQMD are appropriate to use to determine the significance of air quality impacts resulting from the Proposed Alternative Project. Each of these threshold factors is discussed below.

4.2.7 - Regional Significance Thresholds

The following regional significance thresholds have been established by SCAQMD. Projects within the Basin region with construction- or operation-related emissions in excess of any of the thresholds presented in Table 4.2-4 are considered significant:

Table 4.2-4: SCAQMD Regional Thresholds

Pollutant	Construction (pounds per day)	Operation (pounds per day)
Oxides of Nitrogen (NO_X)	100	55
Volatile Organic Compounds (VOC)	75	55
Particulate Matter (PM_{10})	150	150
Particulate Matter ($PM_{2.5}$)	55	55
Oxides of Sulfur (SO_X)	150	150
Carbon Monoxide (CO)	550	550
Source: South Coast Air Quality Management District, 2006.		

4.2.8 - Local Significance Thresholds

Construction

The SCAQMD Governing Board adopted a methodology for calculating localized air quality impacts through localized significance thresholds (LSTs), which is consistent with SCAQMD's Environmental Justice Enhancement Initiative I-4. LSTs represent the maximum emissions from a project that will not cause or contribute to an exceedance of the most stringent applicable state or national ambient air quality standard. The LSTs are developed based on the ambient concentrations of that pollutant for each source receptor area and are applicable to NO_X, CO, PM_{10}, and $PM_{2.5}$.

The Proposed Alternative Project is located in Source Receptor Area 38. Even though the Proposed Alternative Project's construction activity is limited to the construction of the interior streets and infrastructure and no grading of individual lots is proposed, in order to evaluate worst-case conditions, it is assumed that construction on the 50 lots will occur over a 12 month period and that a maximum of 4 acres would be disturbed per day. Using the 2003-2005 look-up tables provided in the LST Guidelines for a conservative 5 acres per day disturbed at a receptor distance of 25 meters, Table 4.2-5 shows the appropriate LSTs for construction activity.

Table 4.2-5: SCAQMD Localized Thresholds for Construction

Pollutant	Localized Significance Threshold (lbs/d)
Nitrogen Dioxide (NO_2)	439
Carbon Monoxide (CO)	1,363
Particulate Matter (PM_{10})	14
Particulate Matter ($PM_{2.5}$)	9
Source: South Coast Air Quality Management District, 2003 and 2006.	

LSTs for operational emissions only apply to onsite sources. Since the primary source of emissions for this project is associated with offsite vehicle trips, an LST analysis of long-term emissions is not required.

Nuisance

The SCAQMD has a regulation that governs the discharge from any source such quantities of air contaminants, which cause a nuisance or annoyance to any considerable number of persons or to the public. Creating the potential for a violation of the SCAQMD's Nuisance Rule (Rule 402) would create a potentially significant effect.

4.2.9 - Global Warming Project Level Thresholds

There are several unique challenges to analyzing global warming under CEQA, largely because of its "global" nature. Typical CEQA analyses address local actions that have local – or, at most, regional – impacts, whereas global warming presents the considerable challenge of analyzing the relationship between local and global activities and the resulting potential, if any, for local and/or global environmental impacts. Most environmental analyses examine the "project-specific" impacts that a particular project is likely to generate. With regard to global warming, however, it is generally accepted that the magnitude of global warming effects is so substantial and the contribution of an individual project to global warming is so extremely minuscule that direct significant adverse impacts (albeit not necessarily cumulative significant adverse impacts) would be highly unlikely.

The issue of GHG emissions and global climate change (GCC) is also fundamentally different from any other areas of air quality impact analysis, which are all linked to some region or area in which the

impact is significant. Instead, a global climate change analysis must be conducted on a global level, rather than the typical local or regional setting, and requires consideration of not only emissions from the project under consideration, but also the extent of the displacement, translocation, and redistribution of emissions. In the usual context, where air quality is linked to a particular location or area, it is appropriate to consider the creation of new emissions in that area to be an environmental impact whether or not the emissions are truly "new" emissions to the overall globe. In fact, the approval of a new developmental plan or project does not necessarily create new automobile drivers- the primary source of a land use project's emissions. Rather, new land use projects merely redistribute existing mobile emissions; accordingly, the use of models that measure overall emissions increases without accounting for existing emissions will substantially overstate the impact of the development project on global warming. Overstating the impacts can lead to a misallocation of resources in seeking solutions to GHG emissions and climate change-related problems. This makes an accurate analysis of GHG emissions substantially different from other air quality impacts, where the "addition" of redistributed emissions to a new locale can make a substantial difference to overall air quality.

Generally, the evaluation of an impact under CEQA requires measuring data from a project against a "threshold of significance" (see CEQA Guidelines §15064.7). For global warming, there is not, at this time, an established "threshold of significance" by which to measure an impact. CEQA also requires projects to be evaluated for consistency with "applicable general plans and regional plans" (see CEQA Guidelines §15125(e)). Such plans would include, for example, "the applicable air quality attainment or maintenance plan." These plans involve legislative or regulatory programs applicable to all projects within the region. They establish standards that are independent of the impact analysis described in the CEQA Guidelines (see provisions beginning with Section 15126). The program for GHG emission reductions and maintenance, which ultimately is intended to result from AB 32, would likely constitute such a regional plan when adopted. However, under AB 32, that program does not yet exist and is not expected to be in place for several years. Therefore, there is no local, regional or statewide plan regulating global warming by which the Proposed Alternative Project can be measured. As stated above, OPR asked CARB to recommend a method for setting thresholds of significance. CARB is in the process of establishing GHG thresholds of significance, but they have not yet been adopted at this time.

Notwithstanding these analytical challenges, CEQA Guidelines §15002(a)(1) states that one of the basic purposes of CEQA is to "[i]nform governmental decision makers and the public about the potential, significant environmental effects of proposed activities." Therefore, even if not "typical" under CEQA, this evaluation of the Proposed Alternative Project's potential for contribution to global climate change will analyze that potential in a manner and to an extent reasonably consistent with the policy underpinnings of CEQA.

This analysis is the result of the County's thorough investigation of the impact of the Proposed Alternative Project on global climate change, including a review of Executive Order S-305, AB 32 and the legislative intent behind AB 32, as well as extensive review of scientific literature regarding global

warming and global climate change. Every effort has been made to maximize the disclosure of information to the public, fairly present the potential for significant adverse effects as a result of global warming, and identify the potential to minimize the potential global warming impacts of the Proposed Alternative Project.

It must be noted that there is great disagreement within the scientific community on any given approach. The County cannot, and need not, under CEQA, review every report from an expert or agency, especially since new reports are released on an almost daily basis. The County has, however, reviewed multiple key advisories, comment letters, and white papers from experts, agencies, and groups such as the Climate Action Team, the California Attorney General, the CAPCOA, CARB, the Center for Biological Diversity, the Sierra Club, and the California Chapter of the American Planning Association. Some of these reports urge "zero emission" thresholds, while others advocate against them. Others evaluate multiple thresholds, such as CAPCOA's January 2008 white paper, which analyzes: (1) CEQA with no GHG thresholds; (2) CEQA with a GHG threshold of zero; and (3) CEQA with non-zero thresholds. As stated in the CAPCOA white paper, "[m]any legal and policy questions remain unsettled, including the requirements of CEQA in the context of GHG emissions. This paper is provided as a resource for local policy and decision makers to enable them to make the best decisions they can in the face of incomplete information during a period of change."

After reviewing much of the relevant literature, the County has determined that OPR, as the agency charged with drafting CEQA thresholds, provides the best available guidance.

Given OPR's current reluctance to create a numerical threshold, the County has also not adopted a numerical threshold. OPR's Draft CEQA Guideline Amendments for GHG Emissions state that a lead agency may consider the following three (3) issues in assessing the significance of impacts from GHG emissions:

(1) The extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting;

(2) Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project; and

(3) The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions.

The Draft CEQA Guidelines Amendments also state that a lead agency should make a good-faith effort, based on available information, to describe, calculate or estimate the amount of GHG emissions associated with a project, including emissions associated with energy consumption and vehicular traffic. Because the methodologies for performing this assessment are anticipated to evolve over time, a lead agency shall have discretion to determine, in the context of a particular project, whether to use a

model or methodology to quantify GHG emissions or to rely on qualitative or other performance based standards for estimating the significance of GHG emissions. (See Draft CEQA Guidelines Amendments § 15064.4(b).)

CEQA defines a "significant effect on the environment" as a substantial, or potentially substantial, adverse change in the environment (Public Resources Code §21068). With respect to global climate change, no one project can individually create a direct impact on what is a global problem (i.e., no project will, by itself, raise the temperature of the planet).

However, a project may be "cumulatively considerable," meaning "that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of current projects, and the effects of probable future projects" (CEQA Guidelines §15065(a)(3)). OPR's Draft Guideline Amendments add that a lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan or mitigation program, such as a climate action plan, sustainable community strategy, or statewide plan of mitigation for GHG emissions. (See Draft CEQA Guidelines Amendments § 15064(h)(3)).

Based on: (a) the Legislature's mandate in AB 32; (b) the continued advancements, yet substantial present-day unknowns, in global warming science; (c) the proposed CEQA guidelines prepared pursuant to SB 97; and (d) several published GHG emissions reduction strategies in the scientific literature, the following threshold will be used for the purposes of analyzing the Proposed Alternative Project's potential to contribute to climate change:

- *Whether the Proposed Alternative Project would conflict with the attainment of the State's goals of reducing GHG emissions as dictated by AB 32*. The Proposed Alternative Project will be deemed to have a less-than-significant impact on global climate change on a cumulative basis if (1) it does not result in GHG emissions that are considerable when compared to the existing environmental setting, and (2) it is consistent with emissions reduction strategies included in local, regional, or statewide planning documents and from reputable published sources such as the California Climate Action Team's (CAT) Report to the Governor, CARB Early Action Measures, and OPR's June 19, 2008 Technical Advisory Memorandum.

4.2.10 - Cumulative Impact Thresholds

Section 15130(b) of the CEQA Guidelines states the following:

> The following elements are necessary to an adequate discussion of significant cumulative impacts: Either a list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency, or a summary of projections contained in an adopted general plan or related planning

document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or area-wide conditions contributing to the cumulative impact.

In accordance with CEQA Guidelines 15130(b), this analysis of cumulative impacts incorporates a summary of projections. The following tiered approach is to assess cumulative air quality impacts. This approach includes the analysis of the following:

- Regional analysis of project air pollutants; and
- Project consistency with existing air quality plans.

4.2.11 - Assessment of the Cumulative Health Effects of the Pollutants

Project Impact Analysis

The following paragraphs analyze the potential impacts of the Proposed Alternative Project on the air quality in the area surrounding the project site. The expected emissions from the construction and operation of the Proposed Alternative Project are calculated as a necessary requisite for assessing the regulatory significance of Proposed Alternative Project emissions on a local and regional level. The paragraphs contain an analysis of the criteria in the CEQA Guidelines regarding air quality as well as an assessment of project conformity with the General Plan.

The Original Proposed Project included 92 residential lots and a 103-slip marina on the 62.43-acre project site. The Proposed Alternative Project reduces the density and intensity of the project with 50 residential lots, a 55-slip marina, and approximately 5.73 acres of dedicated open space in Open Space/Conservation easements.

Short Term Impacts

Short-term impacts will include fugitive dust and other particulate matter, as well as exhaust emissions generated by earthmoving activities and operation of grading equipment during site preparation. Construction emissions are caused by onsite or offsite activities. Onsite emissions principally consist of exhaust emissions (NO_X, CO, VOC, PM_{10}, and $PM_{2.5}$) from heavy-duty construction equipment, motor vehicle operation, and fugitive dust (mainly PM_{10}) from disturbed soil. Offsite emissions are caused by motor vehicle exhaust from delivery vehicles, as well as worker traffic, but also include road dust (PM_{10}). Major construction-related activities include the following:

- Grading/clearing, including the excavation;
- Excavation and earth moving for infrastructure construction of the utilities, both on and offsite, and dwelling unit foundations and footings;
- Building construction;
- Asphalt paving of access roads throughout the development; and
- Application of architectural coatings for things such as dwelling stucco and interior painting.

Construction equipment such as scrapers, bulldozers, forklifts, backhoes, water trucks, and industrial saws are expected to be used on the project site and will result in exhaust emissions consisting of CO, NO_X, VOC, PM_{10}, and $PM_{2.5}$. During the finishing phase, paving operations and application of architectural coatings will release VOC emissions. Construction emission can vary substantially from day to day, depending on the level of activity, the specific type of operation, and prevailing weather conditions. For the purposes of determining worst-case emissions and including reasonably foreseeable results, this analysis assumes that only the area of the home site will be graded, with approximately 4 acres being the maximum acreage graded on any one day. Equipment usage was estimated using the Recommended Construction Fleet Calculator created for the Indirect Source Review Regulation (http://www.valleyair.org/ISR/ISRResources.htm). It was assumed that construction equipment would operate for 6 to 8 hours per day and the entire construction period would last for 12 months.

Table 4.2-6 summarizes these construction-related emissions (without mitigation). The emission estimates were derived from the description of the Proposed Alternative Project using the URBEMIS 2002 Version 8.7 emission model. The URBEMIS data files are provided in Appendix A to the Air Quality report.

Table 4.2-6: Short-Term Emissions (Unmitigated)

Source	Emissions (maximum pounds per day)						
	VOC	NO_X	CO	PM_{10} Exhaust	PM_{10} Dust	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Dust
Site Grading	8.09	49.85	68.64	1.81	41.60	1.67	8.74
Building Construction	69.30	53.32	67.76	1.91	0.09	1.76	0.02
Maximum lbs/day	**69.30**	**53.32**	**68.64**	**43.54**		**10.49**	
Regional Threshold	75	100	550	150		55	
Significant Impact?	No	No	No	No		No	
Local Significant Threshold	NA	439	1,363	14		9	
Significant Impact?		No	No	**Yes**		**Yes**	

NA =Not applicable
Source: URBEMIS, MBA 2008.

The information shown in the above table indicates that the SCAQMD regional emission thresholds will not be exceeded by any pollutant, but the locally significant thresholds will be potentially exceeded due to PM_{10} and $PM_{2.5}$ emissions.

Level of Significance before Mitigation

Potentially Significant – Without mitigation, the short-term emissions are considered to have a significant local impact for particulate matter but a less than significant regional impact.

It is important to note that a previous analysis for the Original Proposed Project consisting of 95 total lots on this site had a significant and unavoidable impact to the short-term construction emissions of ROG and NO_X. A review of the analysis showed that the majority of the ROG emissions were assigned to architectural coatings off-gas. Used in the old analysis was the default emissions factor for architectural coating; however, that does not reflect the effect of the SCAQMD's Architectural Coatings Rule (Rule 1113). The majority of the NO_X emissions came from construction equipment exhaust. The updated URBEMIS version uses emission factors that are more up-to-date and more accurately reflect the current fleet of construction equipment. These analytical changes, in addition to the revision of the Proposed Alternative Project to decrease development density and intensity, eliminated the significant short-term air quality impacts identified in the 2005 Final EIR. Although the short-term air quality impact analysis indicates the Proposed Alternative Project will result in a potentially significant localized impact due to PM_{10} and $PM_{2.5}$ emissions, it must be noted that the 2005 Final EIR did not apply the localized significance thresholds in its analysis.

4.2.12 - Construction Mitigation

AQ-1 Prior to construction of the project, the project proponent will provide a Fugitive Dust Control Plan that will describe the application of standard best management practices (BMP) to control dust during construction. The Fugitive Dust Control Plan shall be submitted to the County and SCAQMD for approval and approved prior to construction. Best management practices will include, but not be limited to:

- For any earth moving which is more than 100 feet from all property lines, conduct watering as necessary to prevent visible dust emissions from exceeding 100 feet in length in any direction.
- For all disturbed surface areas (except completed grading areas), apply dust suppression in a sufficient quantity and frequency to maintain a stabilized surface; any areas which cannot be stabilized, as evidenced by wind driven dust, must have an application of water at least twice per day to at least 80 percent of the unstabilized area.
- For all inactive disturbed surface areas, apply water to at least 80 percent of all inactive disturbed surface areas on a daily basis when there is evidence of wind-driven fugitive dust, excluding any areas that are inaccessible due to excessive slope or other safety conditions.
- For all unpaved roads, water all roads used for any vehicular traffic once daily and restrict vehicle speed to 15 mph.
- For all open storage piles, apply water to at least 80 percent of the surface areas of all open storage piles on a daily basis when there is evidence of wind-driven fugitive dust.

AQ-2 To reduce emissions from the construction equipment within the project site, the construction contractor will:

- To the extent that equipment and technology is available and cost effective, the contractor shall use catalyst and filtration technologies.
- All diesel-fueled engines used in construction of the project shall use ultra-low sulfur diesel fuel containing no more than 15-ppm sulfur, or a suitable alternative fuel.
- All construction diesel engines, which have a rating of 50 hp or more, shall meet the Tier II California Emission Standards for off-road compression-ignition engines, unless certified by the contractor that such engine is not available for a particular use. In the event that a Tier II engine is not available, Tier I compliant or 1996 or newer engines will be used preferentially. Older engines will only be used if the contractor certifies that compliance is not feasible.
- Heavy-duty diesel equipment will be maintained in optimum running condition.

4.2.13 - Short-Term Construction Emissions after Mitigation

Using the URBEMIS model and applying construction mitigation, short-term emissions of PM_{10} and $PM_{2.5}$ after implementation of the above mitigation measures were estimated and are provided in Table 4.2-7. As shown in Table 4.2-7, short-term localized construction emissions are expected to be less than significant after application of mitigation measures.

Table 4.2-7: Short-term Emissions of PM_{10} & $PM_{2.5}$ (Mitigated)

Source	Emissions (maximum lbs/d)	
	PM_{10}	$PM_{2.5}$
Site Grading	6.57	1.64
Building Construction	6.59	1.65
Maximum lbs/day	**6.59**	**1.65**
Local Significant Threshold	14	9
Significant Impact?	No	No
Source: MBA 2008.		

Level of Significance after Mitigation

Less than significant.

Long-Term Impacts

Long-term emissions for the project site are considered for project build-out. Emission sources consist of mobile emissions and stationary emissions. Mobile emissions estimates are derived from motor vehicle traffic. Stationary emissions estimates are derived from the consumption of natural gas,

electricity and consumer products, as well as emissions resulting from landscape maintenance. Assumptions relevant to model input for the long-term emissions estimates are as follows:

- The project site is assumed to generate 479 average daily trips at buildout of the Proposed Alternative Project (2008);
- Natural gas consumption is based on residential land use;
- Landscape equipment emissions during the summer are based on default rates within the URBEMIS 2002 model for residential land uses at buildout year 2008; and
- Fireplace hearth emissions during the wintertime assume the conservative URBEMIS default that 35 percent of the units would have wood stoves, 10 percent would have wood fireplaces, and 55 percent would have natural gas fireplaces.

Since the proposed project is at an altitude of over 5,000 feet and basic exhaust emission rates are based on tests at CARB's Haagen-Smit Laboratory at an altitude of 300 feet, emission rates from vehicles in the vicinity of the project may not be accurately represented in the URBEMIS calculations. According to CARB's on-road motor vehicle emissions model methodology (CARB 2000), some older technology vehicles emit more VOC and CO emissions and fewer NO_X emissions when at higher altitudes. This is a special concern for vehicles operating above 5,000 feet elevation. At higher altitudes, the air pressure and air density is lower than that at sea level. Older technology vehicles, designed for operation at sea level, were not equipped with adaptive fuel controls to reduce the fuel flow for operation at high altitudes. Hence, older technology vehicles tended to run rich at higher altitudes. This increased VOC and CO emissions but suppressed NO_X formation due to the quenching effect of the excess fuel.

Therefore, CARB established correction factors of 1.3 for VOC, 1.9 for CO, and 0.6 for NO_X that are to be applied to the running exhaust and continuous starting emissions for operation above 5,000 feet. These correction factors are only applicable to older technology gasoline fueled vehicles. Newer technology vehicles have adaptive fuel controls that compensate for higher altitudes. CARB determined the correction factor would only apply to the Technology Groups listed in Table 4.2-8.

Table 4.2-8: Technology Groups with Altitude Correction Factors

Tech Group	Model Years	Technology Group Description
1	Pre-1975	With Secondary Air
2	Pre-1975	Without Secondary Air
3	1975-1982	No Catalyst
4	1975-1976	Oxidation Catalyst with Secondary Air
5	1975-1979	Oxidation Catalyst without Secondary Air
6	1980-1989	Oxidation Catalyst without Secondary Air
7	1977-1987	Oxidation Catalyst with Secondary Air

An analysis of EMFAC2007 for the Basin portion of San Bernardino County for the current year (2007), buildout year (2008), and long-term operations (2030) was conducted. Results of this analysis are presented in Appendix B to the Air Quality Analysis (see Appendix A of this Revised and Recirculated Draft EIR). The number of vehicles operating in these technology groups as a percentage of all vehicles was determined to be only 2.78 percent in 2007, 1.69 percent in 2008, and 0 percent in 2030. Therefore, it was determined that further application of correction factors would not be necessary due to the negligible effect on the total emissions.

An estimate of the daily total long-term project emissions is derived by combining both mobile and stationary emissions (natural gas consumption, consumer product consumption, hearth use, paint applications, and landscape maintenance). Using the model URBEMIS, total daily emissions were estimated for summer and winter. Table 4.2-9 shows long-term estimated daily total summer emissions and Table 4.2-10 shows winter emissions.

In addition, it can be assumed that the future residents would also have personal water craft for use on Big Bear Lake. An estimate of personal water craft emissions was made using the model used by CARB to estimate emissions from off-road motor vehicles (OFFROAD2007) for the year 2010, using San Bernardino County small recreational craft emissions only. The small recreational craft categories were used because Big Bear Municipal Water District Regulationsdoes not allow any craft larger than 26 feet in length on the lake. Total number of craft in San Bernardino County for 2010 is estimated at 22,449. Assuming that each household has one craft, the Alternative would generate 50 craft, which is 0.223 percent of the County's total. OFFROAD emissions are generated on an average yearly basis so Table 4.2-9 and Table 4.2-10 include the average pounds per day of emissions from portion of total emissions that would be generated by 50 watercraft.

Table 4.2-9: Long-Term Emissions (summer)

Pollution Source	Emissions (pounds per day)				
	VOC	NO_X	CO	PM_{10}	$PM_{2.5}$
Mobile Emissions	3.48	6.06	43.49	4.86	1.21
Natural Gas Consumption	0.05	0.63	0.27	NG	NG
Landscape Emissions	0.25	0.01	1.74	0.01	NG
Consumer Products	2.45	NG	NG	NG	NG
Architectural Coatings	1.70	NG	NG	NG	NG
Personal Water Craft	5.84	0.46	11.13	0.68	0.68
Combined Emissions Totals (lbs/day)	**13.77**	**7.16**	**56.63**	**5.55**	**1.89**
Regional Threshold	55	55	550	150	55
Exceed Threshold?	No	No	No	No	No

NG = negligible
Source: URBEMIS, MBA 2008.
1: Big Bear Municipal Water District webpage http://www.bbmwd.org/regulations.htm. Accessed September 20, 2007.

Sources for air quality impacts from the Proposed Alternative Project include particulate and gaseous emissions from construction activities, and are temporary. Some of these activities are controlled by SCAQMD permit conditions and by specified control measures in the District's Best Available Control Technology (BACT) guidelines, which are required before a permit to begin construction may be issued.

Table 4.2-10: Long-Term Emissions (winter)

Pollution Source	Emissions (pounds per day)				
	VOC	NO_X	CO	PM_{10}	$PM_{2.5}$
Mobile Emissions	4.23	7.23	52.66	4.86	1.21
Natural Gas Consumption	0.05	0.63	0.27	NG	NG
Hearth Emissions	28.38	0.98	51.91	7.74	7.12
Consumer Products	2.45	NG	NG	NG	NG
Architectural Coatings	1.70	NG	NG	NG	NG
Combined Emissions Totals (lbs/day)	**36.81**	**8.84**	**104.84**	**12.60**	**7.39**
Regional Threshold	55	55	550	150	55
Exceed Threshold?	No	No	No	No	No

NG = negligible
Source: URBEMIS, MBA 2008.

Level of Significance before Mitigation

Less than Significant – When emissions projections are compared with the SCAQMD suggested regional thresholds for significance, all long-term emissions are below the applicable thresholds.

It is important to note that a previous analysis documented in the 2005 Final EIR for a 92-lot subdivision on this site had a significant and unavoidable impact to the regional levels of ROG, CO, and PM_{10}. A review of the analysis showed that the majority of the emissions were assigned to wood fireplaces. The analysis used the URBEMIS model version available at the time (Version 7G), which has been determined to have had an error in calculating emissions from hearth activities. The emissions calculated for this report used the current version of URBEMIS (Version 8.7), which is considered more reliable.

CO Hotspots

CO is a localized problem requiring additional analysis beyond total project emissions quantification. Projects with sensitive receptors or projects that could negatively impact levels of service (LOS) of existing roads are required to use the University of California Davis, Institute of Transportation Studies document *Transportation Project-Level Carbon Monoxide Protocol (CO Protocol)* (UCD 1997) (hereafter referred to as the CO Protocol) to determine the potential to create a CO hot spot. A CO hot spot is a localized concentration of CO that is above the State or Federal 1-hour or 8-hour

ambient air standards. Localized high levels of CO are associated with traffic congestion and idling or slow-moving vehicles. The Proposed Alternative Project has the potential to negatively impact the LOS on adjacent roadways and, therefore, requires a CO hotspot analysis.

The significance of project-related CO impacts is generally based on guidance presented in the CO Protocol. This document presents a series of criteria that are used to determine the significance of impacts. The impact on CO is considered significant if the project will:

- Degrade operation of an intersection to level of service LOS E or F; or
- Substantially worsen an intersection already operating at LOS F.

For the purposes of determining potential impacts on CO concentrations, a screening procedure was developed to allow the conservative evaluation of CO concentrations without having to run computational models such as EMFAC and CALINE4. Screening procedures provide a relationship among CO concentrations and the most important parameters that affect those concentrations. The screening procedure is contained in the CO Protocol. The Protocol states that the determination of project-level CO impacts should be carried out according to a Local Analysis flow chart.

As presented in the Moon Camp Traffic Impact Analysis (TIA) conducted by Urban Crossroads (2007), affected intersections are projected to operate at a Level of Service "C" or better during peak hours with the improvements listed. According to Section 4.7.2 of the CO Protocol, if the project does not involve any intersections with an LOS "E" or "F," no further analysis is necessary.

However, since the TIA indicates that three of the study intersections are currently operating at a LOS F in 2010 with Proposed Alternative Project without improvements, there is no guarantee that the improvements proposed will actually be constructed within a reasonable time after development of the Proposed Alternative Project. Since these intersections may continue to operate in deficient conditions for some time after opening year of the Proposed Alternative Project, a detailed analysis was conducted on three intersections.

The CARB emission factor model, EMFAC2002, was used to estimate the emission factors for the year 2009. Additional assumptions include approach/departure speed - 5 miles per hour; travel speed - 25 miles per hour; temperature - 40 degrees Fahrenheit; season - winter; and geographical area - South Coast Air Basin.

Using the CALINE4 model, potential CO hotspots were analyzed at the intersections listed in Table 4.2-11. As shown in Table 4.2-11, the estimated 1-hour and 8-hour concentrations, in combination with background concentration, are below the State and Federal ambient air quality standards. No CO hotspots are anticipated as a result of traffic-generated emissions by the Proposed Alternative Project in combination with existing traffic. Therefore, the mobile related emissions are not anticipated to contribute substantially to an existing or projected air quality violation.

Table 4.2-11: Carbon Monoxide Concentrations

Intersection	1-Hour Concentration*	8-Hour Concentration**	Significant Impact?***
North Shore Dr. at Big Bear Blvd.	4.1	3.1	No
North Shore Dr. at Stanfield Cutoff	3.7	2.8	No
Big Bear Blvd. at Stanfield Cutoff	5.0	3.7	No

Source: Project contribution estimated using Caline4; see Appendix G for model output.
* CALINE4 output plus background concentration of 3 ppm (from Table 1)
** CALINE4 output multiplied by a persistence factor of 0.7 (from page 9-11 of the 1993 South Coast Air Quality Management District CEQA Handbook). The background concentration of 2.3 (from Table 1) was then added.
*** Comparison of the 1-hour concentration to the state standard of 20 ppm and comparison of the 8-hour concentration to the state/federal standard of 9 ppm.

Level of Significance before Mitigation

Less than significant.

Residential Woodburning

Wood stoves and fireplaces are reasonably common in the area surrounding Big Bear Lake. Some people use wood as a primary source of heat, and others have wood stoves as a back up in case of emergencies, such as power failures. Wood heating is also popular for cultural reasons when one considers that it can be beneficial because wood is a renewable fuel. However, the smoke from wood stoves and fireplaces pollutes the air outdoors. Smoke from outside can seep into buildings, including nearby homes, also affecting indoor air quality. Smoke from neighborhood stoves and fireplaces, a common source of both odor and reduced visibility, greatly contributes to the air pollution problems people complain about most.

Complete combustion gives off light, heat, and the gases carbon dioxide and water vapor. Because complete combustion does not occur when wood burns, wood smoke is produced which contains CO, NO_X, and ROG. The ROG from woodburning includes toxic and/or cancer-causing substances, such as benzene, formaldehyde and benzo-a-pyrene, a polycyclic aromatic hydrocarbon (PAH).

Most wood heaters, such as woodstoves and fireplaces, release far more air pollution, indoors and out, than heaters using other fuels. In winter, when we heat our homes the most, cold nights with little wind cause smoke and air pollutants to remain stagnate at ground level for long periods. Even though there is no shorter averaging time for particulate matter air quality standards, there is a still a potential for nuisance violations in the area.

Level of Significance before Mitigation

Potentially significant.

Conventional factory-built fireplaces are not efficient at producing heat. These fireplaces are also the source of smoke, indoors and out. To reduce the nuisance risks of smoke – indoor and outside, while still allowing homeowners the ambiance, an EPA-certified fireplace insert is suggested. Additionally, wood heat can be supplied with various EPA-certified wood stoves, pellet stoves, or natural gas heaters. While older uncertified stoves and fireplaces release 40 to 60 grams of smoke per hour, new EPA-certified stoves produce only 2 to 5 grams of smoke per hour.

CARB explains that (CARB 2007) the heating efficiency of any wood heater depends on combining two factors: 1) how completely it burns the firewood (combustion efficiency), and 2) how much of the fire's heat gets into the room, rather than going up the flue (transfer efficiency). The measured heat efficiency of an open-hearth fireplace can range from -10 percent to 10 percent. The heating efficiency of an EPA-certified stove, insert, or fireplace can range from 60 percent to 80 percent.

CARB recommends (CARB 2007) that the owner gets into the habit of glancing out at their chimney top every so often. Apart from the half hour after lighting and refueling, a properly burning fire should give off only a thin wisp of white steam. If they see smoke, they should adjust the dampers or air inlets to let in more air. The darker the smoke, the more pollutants it contains and the more fuel is being wasted.

Homeowners choosing to use fireplaces and woodstoves need to understand that healthy outdoor and indoor air quality requires good wood burning habits. Most fireplaces will rob the house of heat because they draw air from the room and send it up the chimney. Occupants are warmed if they sit within 6 feet of the fire, but the rest of the house gets colder as outdoor air leaks in to replace the hot air going up the chimney. The key to burning clean and hot is to control the airflow. Most fireplaces waste wood because of unrestricted airflow. A lot of air helps the fire burn fast, but a load of wood will last only one or two hours.

Residential Woodburning Mitigations

AQ-3 To reduce the emissions from woodburning apparatus; the following requirement will be placed on all new residences constructed on the proposed project's lots:

- No open-hearth fireplace will be allowed in new construction, only EPA Phase II Certified fireplaces and wood stoves, pellet stoves, and natural gas fireplaces shall be allowed.

AQ-4 To establish a "Good Neighbor Policy for Burning" that will further help reduce the potential for localized nuisance complaints related to woodburning; the proponent shall distribute an informational flyer to each purchaser of lots. At a minimum, the flyer will say:

KNOW WHEN TO BURN

- Monitor all fires; never leave a fire unattended.
- Upgrade an older woodstove to one with a catalytic combustor that burns off excess pollutants.

- Be courteous when visitors come to your home. Wood smoke can cause problems for people with developing or sensitive lungs (i.e. children, the elderly) and people with lung disease.

KNOW WHAT TO BURN

- Split large pieces of wood into smaller pieces and make sure it has been seasoned (allowed to dry for a year). Burning fresh cut logs = smoky fires.
- When buying wood from a dealer, do not assume it has been seasoned.
- Small hot fires are more efficient and less wasteful than large fires.
- Never burn chemically treated wood or non-wood materials.
- Manufactured fire logs provide a nice ambience, have the least impact to air quality, and are a good choice for homeowners who use a fireplace infrequently.

KNOW HOW TO BURN

- Proper combustion is key. Make sure your wood fire is not starved; if excess smoke is coming from the chimney or stack, the fire isn't getting enough air.
- Visually check your chimney or stack 10 to 15 minutes after you light a fire to ensure it is not emitting excess amounts of smoke.
- Homeowners should have woodstoves and fireplaces serviced and cleaned yearly to ensure they are working properly.

Level of Significance after Mitigation

Less than Significant.

Conformance with Air Quality Management Plan

The CEQA checklist indicates that a significant impact would occur if a proposed project would conflict with or obstruct implementation of the applicable air quality plan.

This assessment will use four criteria for determining consistency of the Proposed Alternative Project with the current AQMP, as discussed below. The first and second criteria are from the SCAQMD. According to the SCAQMD, there are two key indicators of AQMP consistency: 1) whether the project will not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP; and 2) whether the project will exceed the assumptions in the AQMP based on the year of project build out and phase (SCAQMD 2006b). The third criterion is compliance with the control measures in the AQMP. The fourth criterion is compliance with the SCAQMD regional thresholds.

Project's Contribution to Air Quality Violations

As shown in discussion Section 4.2.13 and 4.2.14 of Short and Long-Term Impacts, the Proposed Alternative Project would not violate any air quality standard or contribute substantially to an existing or projected air quality violation. Therefore, the Proposed Alternative Project meets the first indicator.

AQMP Assumptions

One way to assess project compliance with the AQMP assumptions is to ensure that the population density and land use are consistent with the growth assumptions used in the air plans for the air basin. According to CARB transportation performance standards, the rate of growth in vehicle miles traveled (VMT) and trips should be held to the rate of population growth (SCAQMD 2006b). Compliance with this performance standard is one way suggested by CARB of showing compliance with the growth assumptions used in the AQMP. If the total VMT generated by a proposed project at build-out is at or below that predicted by the AQMP, then the project's mobile emissions is consistent with the AQMP. It is assumed that the existing and future pollutant emissions computed in the AQMP were based on land uses from area general plans.

Under the existing zoning of the project site, only one lot would be allowed on the 62.43 acres. The Proposed Alternative Project would allow 50 lots in the same area. This would result in a net increase of 487 trips per day above the current general plan expected growth. The TIA provided an estimation of daily traffic generated by projects planned in the area in 2030. The results indicate that the other developments' daily trip generation would be 15,111 in 2030. The Proposed Alternative Project traffic generation in 2030 would be 497 trips per day, for a total of 15,608 total trips per day, including the Proposed Alternative Project. This represents just over 3 percent of the projected cumulative growth. Whereas the increase above the parcel alone will be considerable, the relative increase above the vicinity general plan projection is minimal. Therefore, the Proposed Alternative Project is consistent with the assumptions in the AQMP.

Control Measures

The third criterion is compliance with the control measures in the AQMP. The AQMP contains a number of land use and transportation control measures including the following:

- The District's Stationary and Mobile Source Control Measures;
- State Control Measures proposed by CARB; and
- Transportation Control Measures provided by SCAG (AQMP 2003).

CARB's strategy for reducing mobile source emissions includes the following approaches:

- New engine standards;
- Reduce emissions from in-use fleet;
- Require clean fuels, support alternative fuels;
- Reduce petroleum dependency;

- Work with EPA to reduce emissions from national and state sources; and
- Pursue long-term advanced technology measures (AQMP 2003).

Transportation control measures provided by SCAG include those contained in the Regional Transportation Plans (RTP); the most current version is the 2004 RTP. The RTP has control measures to reduce emissions from on-road sources by incorporating strategies such as high occupancy vehicle interventions, transit, and information-based technology interventions (AQMP 2003). The measures implemented by CARB and SCAG affect the project indirectly by regulating the vehicles that the residents may use and regulating public transportation. The Proposed Alternative Project indirectly will comply with the control measures set by CARB and SCAG.

Since the SCAQMD's rules and regulations are mandatory and enforceable, the Proposed Alternative Project will comply with all of the District's applicable rules and regulations. Therefore, the Proposed Alternative Project complies with this criterion.

Compliance with the SCAQMD Regional Thresholds

Although there is no known guidance that correlates AQMP consistency with the SCAQMD regional thresholds, it is common to use the thresholds in assessing AQMP compliance.

The regional significance analysis of construction and operational emissions demonstrated that emissions would not exceed the SCAQMD regional significance thresholds. Therefore, the Proposed Alternative Project is consistent with the SCAQMD regional thresholds.

Level of Significance before Mitigation

Less than Significant.

4.2.14 - Potential for Air Quality Standard Violation

The CEQA Guidelines indicate that a project would have a significant impact if it would violate any air quality standard or contribute substantially to an existing or projected air quality violation.

The South Coast Air Basin, the geographical area in which the project is located, is in nonattainment for CO, PM_{10}, $PM_{2.5}$, and ozone. Levels of PM_{10} and $PM_{2.5}$ are locally high enough that contributions from new sources may add to the concentrations of those pollutants and contribute to a projected air quality violation. Although background levels of ozone are high in the basin, the project alone (without other cumulative sources) would not contribute substantially to a projected air quality violation of ozone. Project emissions of VOC and NO_X (ozone precursors) and their cumulative contribution to ozone concentrations are discussed in Cumulative Impacts below.

Although CO is still listed as a nonattainment pollutant, the basin has not exceeded the CO standard for the past several years. Additionally, as shown in Table 4.2-11, the Proposed Alternative Project's source receptor area has not violated the CO standard for the past several years.

Two criteria are used to assess the significance of this impact: 1) the localized construction analysis; and 2) the CO hotspot analysis. These analyses are discussed above and have concluded that they would result in a less than significant impact.

Particulate matter emissions during operation (PM_{10} and $PM_{2.5}$) are primarily from paved road dust and fireplaces. It is not likely that the Proposed Alternative Project would generate enough paved road dust during operation to violate a PM_{10} or $PM_{2.5}$. Also, it is not likely that particulate matter emissions from woodburning devices in an entire day would be enough to violate the 24-hour standards for either PM_{10} or $PM_{2.5}$. In addition, the regional significance analysis demonstrated that emissions of PM_{10} and $PM_{2.5}$ are below the regional significance thresholds.

Sulfur dioxide emissions from the Proposed Alternative Project are negligible. The regional analysis demonstrated that emissions are far under the regional significance threshold. Therefore, it follows that on a localized basis, emissions of sulfur dioxide would not exceed the ambient air quality standards. In addition, the basin is in attainment for sulfur dioxide and does not experience high pollutant episodes of that pollutant. Therefore, potential impacts of sulfur dioxide are less than significant.

Level of Significance before Mitigation

Less than Significant.

Contribution to Climate Change

The threshold of significance proposed in this document is not simply if the Proposed Alternative Project would result in an increase in GHG emissions, but if the Proposed Alternative Project would result in an increase in GHGs that would significantly hinder or delay the State's ability to meet the reduction targets contained in AB 32.

Consistent with the mandates of AB 32, SB 97, and the OPR Technical Advisory Memorandum and its guidance on providing analysis of global climate change in CEQA documents, the Proposed Alternative Project's cumulative impact on global climate change has been based on the following methodology:

- Calculation of GHG emissions. This step is for informational purposes, and will be used to determine whether the Proposed Alternative Project's emissions are considerable when compared to the existing environment.
- Incorporation of GHG Emission Reduction Strategies. If a project incorporates design features that assist in achieving increased energy efficiencies and in so doing reduces GHG emissions levels from the status quo, then the project's cumulative impact on global climate change is considered less-than-significant.

Emissions Estimation Assumptions

Construction. The Proposed Alternative Project would emit GHGs, during construction, from combustion of fuels in worker vehicles accessing the site as well as from the construction equipment. Exhaust emissions during construction for the Proposed Alternative Project were estimated using URBEMIS2007 version 9.2.4 (URBEMIS 2007). The detailed calculations are provided in Appendix E of the Air Quality Analysis.

Operation. GHG emissions from area emissions and motor vehicles were generated using URBEMIS 2007. Emissions of nitrous oxide and methane emissions from natural gas consumption were estimated using emission factors as described in the attached spreadsheets in Appendix E of the Air Quality Analysis.

Electricity usage for commercial operations was estimated using emission factors as described in the attached spreadsheets in Appendix E. The California Climate Action Registry (CCAR) emission factors for electricity use are 804.54 pounds of CO_2 per MWh, 0.0067 pounds of NH_4 per MWh, and 0.0037 pounds of N_2O per MWh.

Note that emissions models such as EMFAC and URBEMIS evaluate aggregate emissions and do not demonstrate, with respect to a global impact, how much of these emissions are **"**new**"** emissions specifically attributable to the proposed project. For most projects, the main contribution of GHG emissions is from motor vehicles, but how much of those emissions are **"**new**"** is uncertain.

Emissions Inventory

The emissions are estimated in tons per year, which are converted to metric tons of carbon dioxide equivalents ($MTCO_2e$). The carbon dioxide emissions from construction activity are shown in Table 4.2-12. The GHG emissions from operation of the Proposed Alternative Project are shown in Table 4.2-13. At buildout, the Proposed Alternative Project will emit approximately 1,591.60 $MTCO_2e$ per year. Approximately 82 percent of operational GHGs will be generated by vehicular activity associated with the Proposed Alternative Project . Natural gas use and indirect emissions from electricity generation will contribute approximately 11 percent and 6 percent of the operational GHG inventory, respectively.

Table 4.2-12: Construction Generated Carbon Dioxide Emissions

Source	Total tons	$MTCO_2e$
Project Construction	401.22	363.99
Source: Michael Brandman Associates, 2008		

Table 4.2-13: Operational Greenhouse Gas Emissions

Source	Tons			Metric Tons CO_2e
	Carbon Dioxide	Nitrous Oxide	Methane	
Motor Vehicles	1,378.00	0.18	0.39	1,309.49
Natural Gas	189.75	0.00	0.02	172.67
Indirect Electricity	113.17	0.00	0.00	102.83
Hearth	6.63	—	—	6.01
Landscape Equipment	0.65	—	—	0.59
Total	**1,688.20**	**0.19**	**0.41**	**1,591.60**
Source: Michael Brandman Associates, 2008				

Energy Efficient Design Features

The Proposed Alternative Project would be developed with many construction and design attributes that would facilitate increases in energy efficiencies and a corresponding decrease in GHG emissions. The following design attributes and elements of the Proposed Alternative Project have been formulated based on the following fundamental objectives:

- Conservation of natural resources;
- Wise use of energy;
- Improvement of indoor air quality; and
- Achievement of livable communities

Community Design and Planning

Incorporate the following design and planning features as practical:

- Subdivision Layout & Orientation to Improve Natural Cooling and Passive Solar Attributes – summer temperatures in neighborhoods that have large expanses of pavement exposed to the sun can be several degrees warmer than neighborhoods with shaded pavement. Homes shall be oriented to take advantage of solar access to provide passive solar heat in the winter and minimize solar heat in the summer months. Planning strategies that consider solar access can address these concerns.

Site Design

Incorporate the following site design features as possible and practical:

- Protect Topsoil from Erosion and Reuse after Construction – Soil is a valuable, living resource that should be protected. Through careful planning and construction practices, valuable soil as well as mature trees and other plants can be preserved.

- Limit and Delineate Construction Footprint for Maximum Protection – Limit and delineate the construction footprint; restrict heavy equipment that compacts soil, including cars, to areas that are or will be paved or built over. Identify areas to be paved as a place to store existing topsoil, if topsoil needs to be removed from an area during construction. Protect stored soil from erosion.
- Recycle Construction Waste (Including Green Waste) – Each year close to nine million tons of construction and demolition (C&D) debris is disposed of in California landfills. This represents 22 percent of the statewide waste stream, but in newer communities, C&D waste sent to landfills can be as high as 50 percent. Construction waste generally consists of wood, drywall, metal, concrete, dirt, and cardboard. It can also include plant debris (green waste) from the landscape. Much of this material can be reused or recycled.
- Use Recycled-Content Aggregate (Minimum 25 percent) – Recycled concrete and asphalt crushed to 3/4-inch meets the California Department of Transportation's (Caltrans) specification for Class 2 Aggregate Base.
- Design windows to catch prevailing breezes and provide cross ventilation – Install high windows, skylights, or cupolas with securable low windows to create a stack effect that exhausts rising hot air and draws in cooler outdoor air.
- Install energy-efficient windows (double-paned, low-conductivity frames, and low-e coating) – There are two types of low-e glazing. One is heat rejecting (hard coat) and the other is heat receiving (soft coat). The recommended south glazing for passive solar buildings is low-e hard coat, heat receiving glazing with a U-factor of 0.40 or lower and a solar heat gain coefficient (SHGC) of 0.65 or higher.

Foundation

- As practical or feasible, replace Portland Cement in Concrete with Recycled Flyash or Slag – Flyash is a byproduct of coal-burning power plants. It is typically landfilled, but can be an inexpensive and quality substitute for a portion of the Portland cement in concrete. Concrete suppliers routinely replace 10 to 15% of the Portland cement in their mixes with flyash. Slag, a byproduct of the steel industry, may also be used like flyash to replace some of the cement.

Landscaping

As practical or feasible, incorporate the following measures into landscape design:

- Minimize Turf Areas in Landscape Installed by Builder – Lawns (or turf) are useful for recreation and relaxation, but turf requires frequent cutting, watering and application of fertilizers or other chemicals to stay green during California's long dry season.
- Install High-Efficiency Irrigation Systems, such as Drip, Bubblers, or Low-flow Sprinklers or Smart Controllers – With increasing demand on supplies of fresh water, efficient landscaping irrigation is vital in California. Efficient irrigation systems apply only the amount of water that the plants need, with little or no waste through runoff, over watering, or misting.
- Incorporate Two Inches of Compost into the Top 6 to 12 Inches of Soil – A robust, living soil with sufficient organic content is the foundation of a water-conserving, resource-efficient,

thriving landscape. Adding good quality compost before planting brings life to the soil and feeds existing soil organisms, fueling many natural processes that supply nutrients, minimize disease, and improve soil quality.

Structural Frame and Building Envelope

As practical and feasible, incorporate the following features into residential construction:

- Structural Frame & Building Envelope;
  - Reduce Pollution Entering the Home from the Garage by providing a Tightly Sealed Air Barrier between Garage and Living Area, Install Garage Exhaust Fan, or Build a Detached Garage – According to the U.S. EPA, an attached garage is the biggest contributor to poor indoor air quality in a home. Car exhaust contains many known carcinogens and can migrate into living spaces through doors and cracks in walls and ceilings adjacent to the garage. Other pollutants commonly found in garages include benzene from lawn mowers and power tools, pesticides for gardens, toxic cleaning agents, and chemicals in paints and adhesives.
  - Use wall materials that improve thermal mass – Low cost strategies for thermal mass walls include using 5/8" drywall on all interior surfaces. Less conventional approaches include using pre-cast insulated concrete walls or insulated concrete forms (ICFs).
- Exterior Finish
  - ***Use Durable and Noncombustible Siding Materials*** – Sidings made of metal, stone, brick, stucco and fiber-cement offer a durable and noncombustible home exterior.
  - ***Use Durable and Noncombustible Roofing Materials*** – Forty- to fifty-year asphalt shingles, tile, slate, fiber-cement, recycled plastic and metal are examples of durable roofing materials. A Class A fire rating offers a home the highest in fire protection.
- Insulation
  - ***Install Insulation with 75 Percent Recycled Content in Walls***, Floors, and/or Ceilings – Fiberglass insulation typically contains 25 to 30 percent recycled glass, with a combination of post-industrial and post-consumer content. Materials such as recycled cotton or cellulose insulation contain up to 80 percent post-industrial or post-consumer recycled materials.
  - ***Install Insulation That Is Low-Emitting (Certified CA Section 01350)*** – Many insulation products emit formaldehyde and other VOCs. Look for products that have been tested for low emissions by a reputable third-party organization or government agency.
- Plumbing
  - Distribute Domestic Hot Water Efficiently by either: Insulating Hot Water Pipes from Water Heater to Kitchen, Insulating All Hot Water Pipes, or use other Engineered Piping – Locating the water heater close to usage points reduces heat loss, speeds the rate of hot water delivery, and reduces water wasted while waiting for hot water to arrive at a

plumbing fixture. For larger houses, an on-demand hot water circulation pump may reduce waiting time without wasting energy.

- Install Only High Efficiency Toilets (Dual-Flush or 1.3 gpf) – Standard new toilets use 1.6 gallons per flush (gpf). Toilets that use less than 1.3 gpf are called High Efficiency Toilets (HETs). HETs are available in dual-flush, pressure-assist, and conventional gravity-flush models.
- Plumbing Fixtures with Below Standard Flow Rates – (Bath faucets <1.5 gal/min & showers <x.0 gal/min). Along with aerators, flow restrictors can reduce water consumption by 13 percent.

- Heating, Ventilation, & Air Conditioning
  - ***Install Sealed Combustion Units in Furnaces and Water Heaters*** – Sealed combustion furnaces and water heaters duct outdoor air directly into a sealed jacket around the combustion chamber and then vent it directly outdoors, eliminating the use of house air for combustion.
  - ***Install Zoned, Hydronic Radiant Heating with Slab Insulation*** – Instead of providing warm air via ducts, hydronic radiant heating systems circulate hot water through under-floor tubing, wall radiators, or baseboard convectors.
  - ***Install High Efficiency Air Conditioning with Environmentally Responsible Refrigerants*** – Energy-efficient air conditioning equipment saves homeowners money and reduces demand for electricity from power plants. Environmentally sound refrigerants reduce the risk of damage to the ozone layer.
  - ***Design and Install Effective Ductwork*** – Poorly designed and installed ductwork lowers heating and cooling system efficiency and capacity, and can contribute to poor indoor air quality and comfort problems.
  - ***Install High Efficiency HVAC Filter (MERV 6+)*** – HVAC filters remove particulates from the air. Minimum Efficiency Reporting Value (MERV) is a metric used to measure an air filter's efficiency. The MERV scale ranges from 1 to 20. The higher the MERV number, the more efficient the filter is at removing particles.
  - ***Install Effective Exhaust Systems in Bathrooms and Kitchens such as Install Energy Star® Bathroom and Kitchen Fans Vented to the Outside and All Bathroom Fans Are on Timer or Humidistat*** – Bathrooms and kitchens produce odors and a lot of moisture that can cause mold and other problems if the rooms are not properly ventilated. Gas ovens and cooktops produce carbon monoxide, nitrogen dioxide and other pollutants. Additionally, cooking food produces odors and particulates.
  - ***Install Mechanical Fresh Air Ventilation Systems, such as Any Whole House Ventilation System That Meets ASHRAE 62.2*** – Ceiling fans improve a home's comfort by circulating air. Energy Star®–qualified models are energy efficient thanks to improved motors, blade designs and fluorescent light kits; also, they can be operated to either draw warm air upward in the summer or push it downward in the winter.

- ***Install Carbon Monoxide Alarms*** – CO is emitted from fuel-burning appliances such as stoves, cooktops, water heaters, furnaces, and fireplaces, as well as from cars and some landscape equipment. If a home is tightly built for energy efficiency but has leaky HVAC ducts, the air leaks may depressurize the home and reverse the flow of exhaust vent pipes. This can introduce carbon monoxide from fuel-burning appliances back into the home, a process known as backdrafting.

- Finishes
  - ***Use Low-VOC or Zero-VOC Paint*** – Most interior paints contain VOCs, a major class of indoor and outdoor air pollutants. Besides affecting indoor air quality, certain VOCs react with other chemicals in the atmosphere, producing ground-level ozone (smog) that can affect human health. Low- and zero-VOC paints reduce these sources of pollution.
  - ***Use Recycled-Content Paint*** – A number of manufacturers have developed high-quality recycled content latex paint and primers. The recycled portion (ranging from 20 percent to 100 percent) comes from unused consumer or industrial stock, as well as paint recovered from household hazardous waste collection facilities. The paint is checked for quality and then sent to paint manufacturers for recycling and blending with a portion of new paint.
  - ***Reduce Formaldehyde in Interior Finishes (CA Section 01350)*** – Formaldehyde is often used as a binder in home-building products such as plywood, particleboard, and other composite wood products. These binders come in two basic forms: urea and phenol. Urea-formaldehyde binders are common in interior-grade products. Phenol-formaldehyde binders are used in exterior applications because they are more water resistant. This water resistance quality makes phenolic glues off gas more slowly and in lower quantities than urea glues, reducing some of the harmful effects on indoor air quality.

Conclusion

As discussed previously, the methodology used in this EIR to analyze the Proposed Alternative Project's potential effect on GCC includes a calculation of GHG emissions for informational purposes, as there is no quantifiable emissions threshold currently defined. Although AB 32 requires GHG emissions to be reduced to 1990 levels by 2020, it does not require CARB to develop a plan to accomplish this reduction until 2011. Though CARB is diligently moving forward to develop this plan, until it has published and adopted its 1990 emissions inventory, there is no "air quality standard" by which to judge a project's contribution to GCC under CEQA Guidelines, Appendix G. Similarly, the PCC notes that there is little consensus as to the ultimate impact of human interference with the climate system and its causal connection to global warming trends.

Accordingly, the potential of the Proposed Alternative Project to create an impact on GCC is based on whether the Proposed Alternative Project would conflict with the attainment of the state's goals of reducing GHG emissions as dictated by AB 32. The Proposed Alternative Project will not interfere

with the state's goals of reducing GHG emissions to 1990 levels by the year 2020 as stated and an 80-percent reduction in GHG emissions below 1990 levels to 2050. As discussed herein, the Proposed Alternative Project will generate a limited amount of GHG generation during construction, and it will lead to a low amount of on-going operational emissions from the use of the 50 residential units. The Proposed Alternative Project would emit less than 25 percent of the SCAQMD's draft numerical GHG threshold of significance (currently proposed as 6,500 $MTCO_2e$). Moreover, the Proposed Alternative Project will utilize high-efficiency design features that will even further reduce consumption of electricity, natural gas, and will result in a corresponding reduction in GHG emissions. Therefore, the Proposed Alternative Project will not significantly hinder or delay California's ability to meet the reduction targets contained in AB 32.

4.2.15 - Cumulative Impacts

Section 15130(b) of the CEQA Guidelines states the following:

> The following elements are necessary to an adequate discussion of significant cumulative impacts, either:
>
> - A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency; or
> - A summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document, which has been adopted or certified, which described or evaluated regional or areawide conditions contributing to the cumulative impact.

In accordance with CEQA Guidelines 15130(b), this analysis of cumulative impacts incorporates a summary of projections. The following four-tiered approach is to assess cumulative air quality impacts;

- Consistency with the SCAQMD project specific thresholds for construction and operation;
- Project consistency with existing air quality plans;
- Assessment of the cumulative health effects of the pollutants; and
- Cumulative impact of global climate change.

Project Specific Thresholds

After implementation of mitigation measures, during construction, emissions of VOC, NO_X, PM_{10}, and $PM_{2.5}$ are not expected to exceed the SCAQMD regional significance thresholds. In addition, during operation, the Proposed Alternative Project is not expected to exceed the established regional emission thresholds for VOC, NO_X, CO, PM_{10}, and $PM_{2.5}$. The SCAQMD considers construction or operational emissions that do not exceed the project specific thresholds will not result in a cumulative impact. Design features that reduce the emissions generated by motor vehicles, natural gas consumption, and electricity consumption will reduce the main operational sources of GHGs, as more fully outlined above. Although the Proposed Alternative Project is not of sufficient size to create a significant

impact to global warming, incorporation of the above recommended design features will further reduce the Proposed Alternative Project's cumulative impact in this area. These design features were developed using the "New Home Construction Green Building Guidelines," 2007 Edition and "Build It Green." March 2007.

Level of Significance before Mitigation

Less than significant.

Air Quality Plans

The Basin, in which the project is located, is in nonattainment for ozone, PM_{10}, $PM_{2.5}$, and CO. As such, the SCAQMD is required to prepare and maintain an AQMP and a SIP to document the strategies and measures to be undertaken to reach attainment of ambient air quality standards. While the SCAQMD does not have direct authority over land use decisions, it was recognized that changes in land use and circulation planning were necessary to maintain clean air. As discussed above, Conformance with Air Quality Management Plan, the Proposed Alternative Project is compliant with the AQMP.

Level of Significance before Mitigation

Less than significant.

Cumulative Health Impacts

The basin is in nonattainment for ozone, PM_{10}, $PM_{2.5}$, and CO, which means that the background levels of those pollutants are at times higher than the ambient air quality standards. The air quality standards were set to protect the health of sensitive individuals (i.e., elderly, children, and the sick). Therefore, when the concentration of those pollutants exceed the standard, it is likely that some of the sensitive individuals of the population could experience health effects as indicated above in Table 4.2-1.

The localized significance analysis for the Proposed Alternative Project demonstrated that during construction activities, no localized significance threshold was expected to be exceeded; therefore, the emissions of particulate matter, primarily in the form of fugitive dust, would not result in a significant cumulative health impact with implementation of the identified mitigation measures.

Long-term operational emissions are not expected to exceed the District's significance thresholds. ROG and NO_X are precursors to ozone. Because ozone is a secondary pollutant (it is not emitted directly but formed by chemical reactions in the air), it can be formed miles downwind of the project site. Proposed Alternative Project emissions of VOC and NO_X may still contribute to the background concentration of ozone but such contributions would not be considered cumulatively considerable.

Operational emissions of PM_{10} and $PM_{2.5}$ are not expected to exceed the regional significance threshold. The combination of ozone and PM_{10} can aggravate health effects. $PM_{2.5}$ is a component of

PM_{10}. The ambient air quality standard for both PM_{10} and $PM_{2.5}$ are exceeded in the Basin. Therefore, Proposed Alternative Project emissions may contribute to the background of those pollutants but such contributions would not be considered cumulatively considerable.

The long-term impacts of wood burning in hearths and fireplaces can potentially emit smoke and toxic air contaminant through the incomplete combustion of the wood products. Such emissions could also impact indoor air quality particularly during winter when adequate ventilation and air exchanges would be at a minimum. These smoke and TAC emissions could contribute to an overall increase in smoke in the area encompassing and surrounding the proposed project site.

Level of Significance before Mitigation

Potentially significant.

Long-term health effects from residential wood burning are not expected to create a significant impact with the implementation of Mitigation Measures AQ-3 and AQ-4. Implementation of these measures would minimize the generation of local wood smoke from wood burning, such that their contribution would not be considered cumulatively considerable.

Level of Significance after Mitigation

Less than significant.

Expose Sensitive Receptors to Substantial Pollutant Concentrations

The CEQA Guidelines indicate that a significant impact would occur if a proposed project would expose sensitive receptors to substantial pollutant concentrations.

The localized construction analysis demonstrated that without mitigation, the Proposed Alternative Project would not exceed the localized thresholds for CO, NO_2, PM_{10}, or $PM_{2.5}$. Therefore, during construction, the Proposed Alternative Project would not expose sensitive receptors to substantial pollutant concentrations of CO, NO_2, PM_{10}, or $PM_{2.5}$.

The construction equipment would emit diesel particulate matter, which is a carcinogen. However, the diesel particulate matter emissions are short term in nature. Determination of risk from diesel particulate matter is considered over a 70-year exposure time. Therefore, considering the dispersion of the emissions and the short time frame, exposure to diesel particulate matter is anticipated to be less than significant.

During operation of the Proposed Alternative Project, a CO hotspot analysis is the appropriate tool to determine if project emissions of CO during operation would exceed ambient air quality standards. The main source of air pollutant emissions during operation are from offsite motor vehicles traveling on the roads surrounding the project. The study area intersections were projected to operate at a Level of Service "C" or better during peak hours with the improvements listed in the TIA. According to

Section 4.7.2 of the CO Protocol, if a project does not involve any intersections with an LOS "E" or "F", no further analysis is necessary. Therefore, according to this criterion, air pollutant emissions during operation of the Proposed Alternative Project would result in a less than significant impact.

During operation of the Proposed Alternative Project, the addition of woodburning devices to the area would potentially expose sensitive receptors to localized concentrations of criteria and toxic pollutants. With the implementation of mitigation measures identified above, the Proposed Alternative Project would not expose sensitive receptors to substantial pollutant concentrations.

Level of Significance before Mitigation

Less than significant.

4.2.16 - Odors

The CEQA Guidelines indicate that a significant impact would occur if a proposed project would create objectionable odors affecting a substantial number of people.

The Proposed Alternative Project does not contain land uses typically associated with emitting objectionable odors, with the possible exception of wood smoke. Wood smoke is pleasant to some and may be a nuisance to others. Implementation and compliance with SCAQMD Rule 402 would ensure that wood smoke would not be offensive to a substantial number of people. Diesel exhaust and VOCs will be emitted during construction of the Proposed Alternative Project, which are objectionable to some; however, emissions will disperse rapidly from the project site and therefore should not be at a level to induce a negative response.

Level of Significance before Mitigation

Less than significant.

4.3 - Biological Resources

4.3.1 - Introduction

This section describes the biological character of the project site in terms of plants, wildlife, and wildlife habitats and analyzes the biological significance of the site in view of federal (FESA), state (CESA), and local laws and policies. This section evaluates the potential impacts to biological resources on-site and in the vicinity of the project site and recommends mitigation measures, where feasible, to reduce the significance of impacts that are identified.

All biological studies were conducted in accordance with accepted scientific and technical standards that are consistent with the requirements of the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDFG). The following reports were used in the preparation of this section and are included in Appendix B:

- Results of Bald Eagle Survey on Tentative Tract 16136, Moon Camp, Fawnskin, San Bernardino County, California (2002),
- Focused Flying Squirrel Trapping Report Moon Camp Project, Fawnskin, San Bernardino, California (2007),
- Southern Rubber Boa Letter Report from Glenn Stewart of the Biological Sciences of California State Polytechnic University of Pomona (2007),
- Southwestern Willow Flycatcher Focused Survey Report Moon Camp Project, Fawnskin, San Bernardino County, California (2007),
- Moon Camp Tentative Tract 16136 Supplemental Focused Rare Plant Survey (2008),
- Moon Camp Property, Fawnskin Area: Vegetation and Special Status Plants (2009),
- Bald Eagle Count in Area, Moon Camp, Fawnskin, San Bernardino County, California (2009).

4.3.1 - Existing Conditions

The Moon Camp project site (Tentative Tract No. 16136) is located approximately midway along the north shore of Big Bear Lake, at the eastern edge of the community of Fawnskin. The 62.43-acre site slopes upward from the lakeshore and State Route 38 (SR-38) (Lakeshore Drive) from a lake surface elevation of approximately 6,747 feet above mean sea level (msl) to approximately 6,960 feet msl at the northeast boundary. Slopes vary from 5 to 40 percent and continue upward beyond the property to a ridgeline exceeding 7,800 feet msl on the north. The on-site variation in elevation is approximately 213 feet.

Vegetation Communities

Plant communities in California have generally been classified by biologists either according to Holland's Preliminary Descriptions of the Terrestrial Natural Communities of California (1986) or

Sawyer and Keeler-Wolf's A Manual of California Vegetation (1995). Holland's descriptions were developed as part of CDFG's California Natural Diversity Database (CNDDB), and Sawyer and Keeler-Wolf's manual was developed through the California Native Plant Society (CNPS). The CDFG now has a list of terrestrial natural communities which supersedes all other lists developed by the CNDDB. It is based on Sawyer and Keeler-Wolf's manual but it is also structured to be compatible with previous CNDDB lists such as Holland. Wherever applicable the plant communities are classified according to CDFG's list of terrestrial natural communities (2003) and cross-referenced to Holland's element code. Disturbed and developed areas are described according to industry standard descriptions. The CDFG does not currently have a narrative description of these vegetation communities; therefore, the descriptions provided below are according to Holland.

Four vegetation types occur within the project site. Exhibit 4.3-1, *Plant Communities Map*, illustrates their distribution and Table 4.3-1 summarizes the extent of vegetation types present within the project site. Each of the vegetation types observed during field surveys are described below.

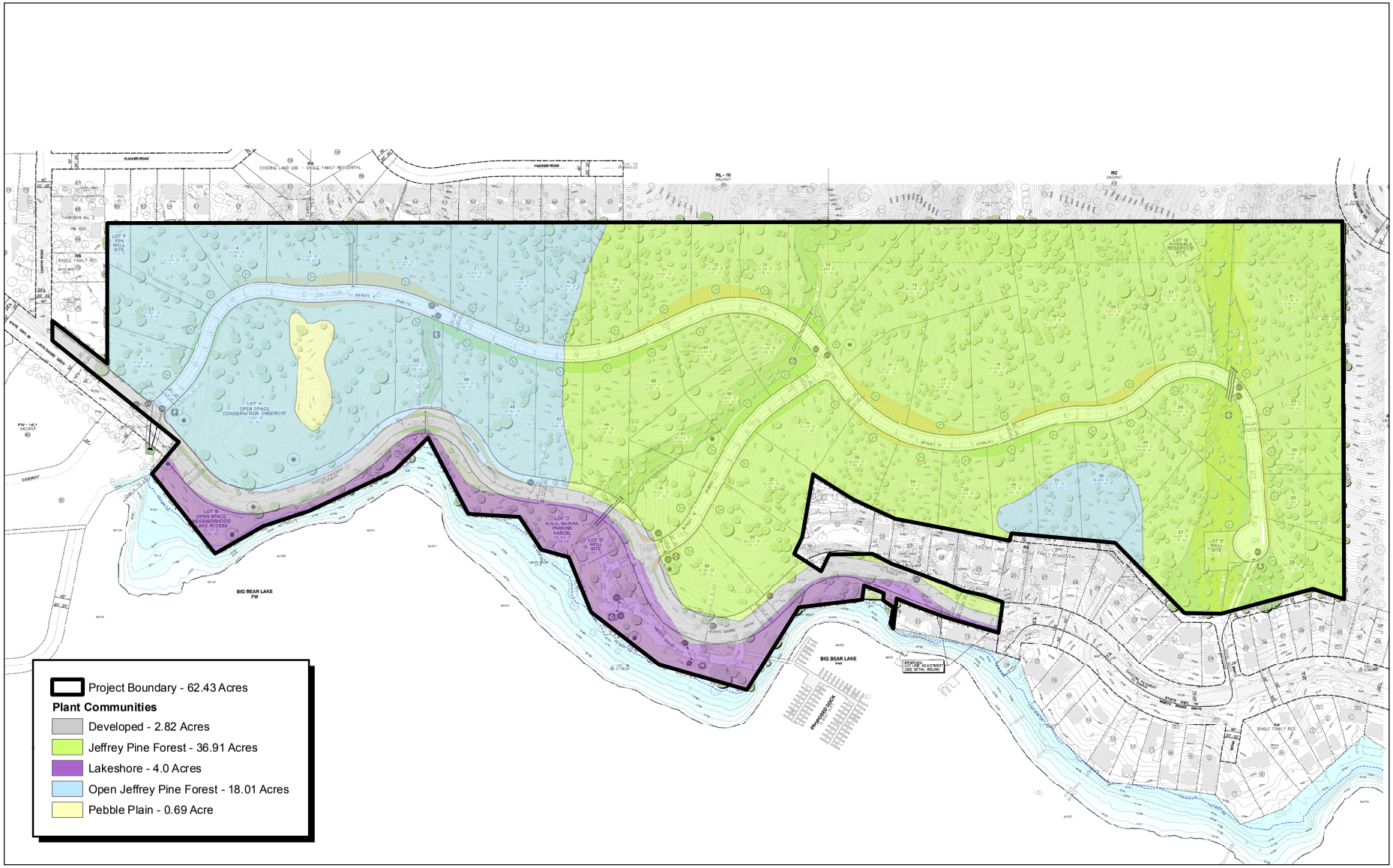
Table 4.3-1: Existing Vegetation Types on the Project Site

Vegetation Type	Acreage
Jeffrey Pine Forest	54.92
Pebble Plain	0.69
Lake Shoreline/ Ruderal	4.0
Developed (SR-38)	2.82
Total	**62.43**

Jeffrey Pine Forest

Jeffrey pine forest occurs on 54.92 acres of the eastern half of the project site. This area is dominated by Jeffrey pine (*Pinus jeffrey*i) with white fir (*Abies concolor*), incense cedar (*Calocedrus decurrens*), western juniper (*Juniperus occidentalis)*, singleleaf pinyon pine (*Pinus monophylla*), and black oak (*Quercus kellogii*) occurring at lower densities. The understory is sparse, consisting of scattered chaparral shrubs including greenleaf manzanita (*Arctostaphylos patula*), mountain whitethorn (*Ceanothus cordulatus*), Greg's ceanothus (*Ceanothus greggii*), deer brush (*Ceanothus leucodermis*), California mountain mahogany (*Cercocarpus betuloides*), and curl-leaf mountain mahogany (*Cercocarpus ledifolius*). Herbaceous cover is generally low, consisting of grasses and forbs in scattered patches. Jeffrey pine forest occurs at elevations ranging from 3,200 to 7,800 feet above msl in southern California.

Open Jeffrey pine forest is shown as a separate vegetation type on Exhibit 4.3-1. Areas within the Jeffrey pine forest that are more open and where herbaceous cover is dominated by Wright's matting buckwheat are suitable habitat for the federally-listed Threatened ash-gray Indian paintbrush, CNPS 1B listed Parish's rock-cress (*Arabis parishii*), and California Native Plant Society (CNPS 1B) listed silver-haired ivesia. Of the 54.92 acres of Jeffrey Pine forest, 18.01 acres are considered open Jeffrey Pine forest habitat.



Source: Source: Hicks & Hartwick, Inc. (July, 2009), Tim Krantz (2008), Scott White & MBA.

NORTH

350 175 0 350

Feet

Michael Brandman Associates

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Exhibit 4.3-1
Plant Communities Map

SAN BERNARDINO COUNTY
MOON CAMP RESIDENTIAL SUBDIVISION PROJECT

Pebble Plain

Pebble plain occurs on 0.69 acre of the project site north of State Route 38 (SR-38). It appears as a distinct open patch within open Jeffrey pine forest in the western portion of the project site. The substrate in this area consists of clay soil mixed with quartzite pebbles and gravel that are continually pushed to the surface through frost action. This substrate supports a high floristic diversity consisting of small cushion-forming plants, tiny annuals, grasses, and succulents that are well spaced, low growing, and sun tolerant. Several rare and special status plants are associated with pebble plain habitat, including federally-listed Threatened and Endangered species. The pebble plain habitat on the project site has been subjected to disturbance by unauthorized off-road vehicles.

Pebble Plains and Drought

Drought related conditions, which occurred during the first half of this decade resulted in pebble plain species being more difficult to locate and identify due to dormancy factors attributed from conditions of prolonged drought. Therefore, surveys that were conducted during this time (2000-2007) attempted a more focused approach in order to identify all suspected areas probable for containing threatened pebble plain species. This practice, through trial and error, may have resulted in an over-calculated estimate as was apparent in the 2008 Krantz survey (non-drought year), which identified a far less quantity of ash-gray Indian paintbrush species within the project site's pebble plain and Jeffrey pine habitats.

Lakeshore Species

Approximately 4.0 acres of the southern boundary of the project site is formed by the shore of Big Bear Lake. Plant species along the shore itself consist primarily of herbaceous native and non-native species of periodically saturated soils, including willowherb (*Epilobium* sp.), wire-grass (*Juncus mexicanus*), cursed buttercup (*Ranunculus sceleratus*), and several cinquefoil species (*Potentilla* spp.). Several seedling cottonwood trees (*Populus balsamifera* spp. *trichocarpa*) also occur in this plant community. Small patches of ruderal species transitioning into upland grassland occur along the lakeshore south of SR-38. The lake was well below its maximum level in 2001 to 2002 due to acute drought conditions. Vegetation in the narrow strip is patchy and occurs above the high-water level in areas where small areas of Jeffrey pine forest are interspersed among open ruderal vegetation and grasslands and scattered patches of arroyo willow (*Salix lasiolepis*) and red willow (*Salix laevigata*).

Developed

Developed areas (abutting SR-38) occur on 2.82 acres along the shoreline of the project site. Plants found in this vegetation type consist of native and non-native ornamental species which offer very little habitat value for native wildlife species. Paved areas such as SR-38 and existing turnouts are included in this vegetation type.

Wildlife

The project site has the potential to support a large variety of wildlife species.

Amphibians

Amphibians require moisture for at least a portion of their life cycle and many require standing or flowing water for reproduction. Although more typical in mesic conditions, there are a number of amphibians species that occur or potentially occur even in the more xeric habitats. These species are able to survive in dry areas by remaining beneath the soil in burrows, under logs or leaf litter, and emerging only when temperatures are low and humidity is high. Many of these species' habitats are associated with water, and they emerge to breed once the rainy season begins. Soil moisture conditions can remain high throughout the year within some habitat types, depending on factors such as amount of vegetation cover, elevation, and slope aspect.

No amphibians were detected during the field surveys; however, leaf litter and rotting logs on the project site provide potential habitat for the Pacific slender salamander (*Batrachoseps pacificus*). The western toad (*Bufo boreas*) would also be expected to occur on the project site.

Reptiles

Reptilian diversity and abundance typically vary with vegetation type and character. Many species prefer only one or two vegetation types; however, most will forage in a variety of habitats. Most species occurring in open areas use rodent burrows for cover and protection from predators and extreme weather conditions. Those species discussed below that were not observed during surveys are expected to occur based on the presence of suitable habitat (substrate and vegetation) within the project site.

Reptile species observed during the surveys include the western fence lizard (*Scleroporus occidentalis*), sagebrush lizard (*Sceloperus graciosus*), western skink (*Eumeces skiltonianus*), southern alligator lizard (*Elgaria multicarinatus*), and southern Pacific rattlesnake (*Crotalus viridis helleri*). Common reptile species expected to occur on the project site include the side-blotched lizard (*Uta stansburiana*) and gopher snake (*Pituophis melanoleucus*).

Birds

Montane conifer forests in the San Bernardino Mountains can experience severe weather conditions during the winter months. Nonetheless, several resident bird species are expected to occur on the project site, using the habitats throughout the year. Other species are present only during certain seasons.

Common resident bird species observed on the project site during surveys include the following:

- Band-tailed pigeon (*Columba fasciata*);
- Great-horned owl (*Bubo virginianus*);
- Red-breasted nuthatch (*Sitta canadensis*);
- White-breasted nuthatch (*Sitta carolinensis*);

- Acorn woodpecker (*Melanerpes formicivorus*);
- Red-breasted sapsucker (*Sphyrapicus ruber*);
- Hairy woodpecker (*Picoides villosus*);
- Nuttall's woodpecker (*Picoides nuttallii*);
- Northern flicker (*Colaptes auratus*);
- Black phoebe (*Sayornis nigricans*);
- Stellar's jay (*Cyanocitta stelleri*);
- Common raven (*Corvus corax*);
- Mountain chickadee (*Poecile gambeli*);
- Bushtit (*Psaltriparus minimus*);
- House wren (*Troglodytes aedon*);
- Western bluebird (*Sialia mexicana*);
- Northern mockingbird (*Mimus polyglottos*);
- European starling (*Sturnus vulgaris*);
- Spotted towhee (*Pipilo maculatus*);
- Dark-eyed junco (*Junco hyemalis*);
- Brewer's blackbird (*Euphagus cyanocephalus*);
- Brown-headed cowbird (*Molothrus ater*);
- House finch (*Carpodacus mexicanus*);
- Red crossbill (*Loxia curvirostra*); and
- Wild turkey (*Meleagris gallopavo*).

Mammals

The ornate shrew (*Sorex ornatus*), brush mouse (*Peromyscus boylii*), western grey squirrel (*Sciurus griseus*), California ground squirrel (*Spermophilus beecheyi*), dusky-footed woodrat (*Neotoma fuscipes*), California vole (*Microtus californicus*), and coyote (*Canis latrans*) were observed on the project site during the surveys. Larger mammals that may occur on the project site include the gray fox (*Urocyon cinereoargenteus*), black bear (*Ursus americanus*), badger (*Taxidea taxus*), and mountain lion (*Felis concolor*). The California myotis (*Myotis californicus*) and big brown bat (*Eptesicus fuscus*) may occur on the project site. Gaps in peeling bark and hollow snags or limbs provide potential roosting and maternal colony opportunities for these and other bat species. Other mammals expected to occur on the project site include the following:

- Dusky shrew (*Sorex monticolus*);
- Broad-footed mole (*Scapanus latimanus*);
- Merriam's chipmunk (*Tamias merriami*);
- Lodgepole chipmunk (*Tamias speciosus*);
- Golden-mantled ground squirrel (*Spermophilus lateralis*);
- Deer mouse (*Peromyscus maniculatus*);
- Western harvest mouse (*Reithrodontomys megalotis*);
- Botta's pocket gopher (*Thomomys bottae*); and
- House mouse (*Mus musculus*).

Special Status Biological Resources

The following discussion addresses special status biological resources observed, reported, or having the potential to occur on the project site. These resources include plant and wildlife species that have been afforded special status and/or recognition by federal and state resource agencies, as well as the CNPS. Table 4.3-2, Special Status Plant Species, and Table 4.3-3, Special Status Wildlife Species, provide a summary of special status plant and wildlife species known to occur in the Proposed Alternative Project region including information on the status, potential for occurrence, and definitions for the various status designations.

Table 4.3-2: Special Status Plant Species Potentially Occurring Within the Project Region

Species	Status[1]			Likelihood for Occurrence
	USFWS	CDFG	CNPS	
Abronia nana ssp. *covillei* Coville's dwarf abronia	None	None	4	None; restricted to carbonates soils
Allium parishii Parish's onion	None	None	4	Low; above known elevation range
Antennaria marginata White-margined everlasting	None	None	2	None; outside of known geographic range (only local occurrences in Barton Flats area)
Arabis breweri var. *pecuniaria* San Bernardino rock-cress	None	None	1B	None; outside geographical range
Arabis dispar Pinyon rock-cress	None	None	2	None; outside known geographic range (only occurs on desert-facing slopes)
Arabis parishii Parish's rock-cress	None	None	1B	Observed
Arabis shockleyi Shockley's rock-cress	None	None	2	None; restricted to carbonates soils
Arenaria lanuginosa ssp. *saxosa* Rock sandwort	None	None	2	Moderate; marginally suitable habitat
Arenaria ursina Big Bear Valley sandwort	FT	C	1B	High; suitable habitat
Astragalus albens Cushenbury milk-vetch	FE	C	1B	None; no suitable habitat (carbonate soils)
Astragalus bicristatus Crested milk-vetch	None	None	4	High; suitable habitat
Astragalus lentiginosus var. *sierrae* Big Bear Valley milk-vetch	None	None	1B	High; suitable habitat
Astragalus leucolobus Big Bear Valley woollypod	None	None	1B	Observed
Atriplex parishii Parish's smallscale	None	None	1B	None; no suitable habitat (alkali sink)
Berberis fremontii Fremont's barberry	None	None	3	None; no suitable habitat (presumed extinct in Cushenbury area)
Botrychium crenulatum Scalloped moonwort	None	None	2	None; no suitable habitat (marshes, bogs)
Calochortus palmeri var. *palmeri* Palmer's mariposa lily	None	None	1B	Moderate; marginally suitable habitat
Calochortus plummerae Plummer's mariposa lily	None	None	1B	None; above known elevation range
Castilleja cinerea Ash-gray Indian paintbrush	FT	None	1B	Observed
Castilleja lasiorhyncha San Bernardino Mountain owl's clover	None	None	1B	High; suitable habitat

Table 4.3 2 (cont.): Special Status Plant Species Potentially Occurring Within the Project Region

Species	Status[1]			Likelihood for Occurrence
	USFWS	CDFG	CNPS	
Dryopteris filix-mas Male fern	None	None	2	Low; local rarity; outside known range
Dudleya abramsii ssp. *affinis* San Bernardino Mountains dudleya	None	None	1B	Moderate; marginally suitable habitat
Erigeron breweri var. *jacinteus* San Jacinto Mountains daisy	None	None	4	None; below known elevation range
Erigeron parishii Parish's daisy	FT	None	1B	None; no suitable habitat (carbonate soils)
Erigeron unicaulis Limestone daisy	None	None	2	None; outside known geographic range (local reports erroneous)
Eriogonum foliosum Leafy buckwheat	None	None	1B	High; suitable habitat
Eriogonum kennedyi var. *austromontanum* Southern mountain buckwheat	FT	None	1B	Low; suitable habitat (see text)
Eriogonum ovalifolium var. *vineum* Cushenbury buckwheat	FE	None	1B	None; no suitable habitat (carbonate soils)
Eriophyllum lanatum var. *obovatum* Southern Sierra wooly sunflower	None	None	4	Low; margin of known geographic range
Fimbristylis thermalis Hot springs fimbristylis	None	None	4	None; no suitable habitat (alkaline meadows, hot springs)
Galium jepsonii Jepson's bedstraw	None	None	4	High; suitable habitat
Galium johnsttonii Johnston's bedstraw	None	None	4	High; suitable habitat
Gentiana fremontii Moss gentian	None	None	2	None; no suitable habitat
Gilia leptantha ssp. *leptantha* San Bernardino Mountains gilia	None	None	1B	Low (see text)
Helianthus nuttalli ssp. *parishii* Los Angeles sunflower	None	None	1A	None; presumed extinct, above known elevation range
Heuchura hirsutissima Shaggy-haired alum root	None	None	1B	Low; limited suitable habitat
Heuchura parishii Parish's alumroot	None	None	1B	Low; limited suitable habitat
Horkelia wilderae Barton Flats horkelia	None	None	1B	None; outside known geographic range, endemic to Barton Flats area
Hulsea vestita ssp. *parryi* Parry's sunflower	None	None	4	None; outside known geographic range (only occurs on desert-facing slopes)
Hulsea vestita ssp. *pygmaea* Pygmy hulsea	None	None	1B	None; below elevation range

Table 4.3 2 (cont.): Special Status Plant Species Potentially Occurring Within the Project Region

Species	Status[1]			Likelihood for Occurrence
	USFWS	CDFG	CNPS	
Ivesia argyrocoma Silver-haired ivesia	None	None	1B	Observed
Juncus duranii Duran's rush	None	None	4	High; suitable habitat
Lesquerella kingii var. *bernardina* San Bernardino Mountains bladderpod	FE	None	1B	None; no suitable habitat (carbonate soils)
Lewisia brachycalyx Short-sepaled lewisia	None	None	2	Moderate; limited suitable habitat
Lilium humbodtii ssp. *ocellatum* Ocellated Humboldt lily	None	None	4	None; above known elevation range
Lillium parryi Lemon lily	None	None	1B	None; no suitable habitat
Linanthus killipii Baldwin Lake linanthus	None	None	1B	High; suitable habitat
Malaxiis monohyllos ssp. *brachypoda* Adder's mouth	None	None	2	None; below known elevation range
Mimulus exiguus San Bernardino Mountain monkeyflower	None	None	1B	High; suitable habitat
Mimulus purpureus var. *purpureus* Purple monkeyflower	None	None	2	Observed
Monardella macrantha ssp. *hallii* Hall's monardella	None	None	1B	None; outside known geographic range
Navarretia peninsularis Baja navarretia	None	None	1B	Low; limited suitable habitat
Oxytheca caryophylloides Chickweed oxytheca	None	None	4	High; suitable habitat
Oxytheca parishii var. *cienegensis* Cienega seca oxytheca	None	None	1B	None; outside known geographic range
Oxytheca parishii var. *goodmaniana* Cushenbury oxytheca	FE	None	1B	None; no suitable habitat (carbonate soils)
Oxytropis oreophila Mountain oxytrope	None	None	2	None; below known elevation range
Perideridia parishii ssp. *parishii* Parish's yampah	None	None	2	Low; limited suitable habitat
Phacelia exilis Transverse Range phacelia	None	None	4	High; suitable habitat
Phacelia mohavensis Mojave phacelia	None	None	4	High; suitable habitat
Phlox dolichantha Bear Valley phlox	None	None	1B	Observed

Table 4.3 2 (cont.): Special Status Plant Species Potentially Occurring Within the Project Region

Species	Status[1]			Likelihood for Occurrence
	USFWS	CDFG	CNPS	
Poa atropurpurea San Bernardino bluegrass	FE	None	1B	Low; limited suitable habitat
Poliomintha incana Frosted mint	None	None	1A	None; no suitable habitat (dunes and sandy flats), above known elevation range
Polystichum kruckebergii Krukeberg's sword fern	None	None	4	None; limited suitable habitat, outside known geographic distribution
Populus angustifolia Narrow-leaved cottonwood	None	None	2	None; outside known geographic range
Pyrrocoma uniflora ssp. *gossypina* Bear Valley pyrrocoma	None	None	1B	Moderate; suitable habitat
Rupertia rigida Parish's rupertia	None	None	4	High; limited suitable habitat
Scutellaria bolanderi ssp. *austromntanum* Southern mountain skullcap	None	None	1B	None, outside known geographic range, above known elevation range
Sedum niveum Davidson's stonecrop	None	None	4	None; no suitable habitat (rock ledges and cliffs)
Selaginella asprella Bluish spike-moss	None	None	4	Low; limited suitable habitat
Senecio bernardinus San Bernardino butterweed	None	None	1B	Low; limited suitable habitat
Senecio ionophyllus Tehachapi ragwort	None	None	4	Low; limited suitable habitat
Sidalcea hickmanii ssp. *parishii* Parish's checkerbloom	C	R	1B	Low; limited suitable habitat
Sidalcea pedata Bird's foot checkerbloom	FE	SE	1B	Low to moderate (see text); suitable habitat
Sphenopholis obtusata Prairie wedge grass	None	None	2	High; suitable habitat
Streptanthus bernardinus Laguna Mountains jewelflower	None	None	4	High; suitable habitat
Streptanthus campestris Southern jewelflower	None	None	1B	High; suitable habitat
Swertia neglecta Pine green-gentian	None	None	4	High; suitable habitat
Taraxacum californicum California dandelion	FE	None	1B	Low; limited suitable habitat
Thelypodium stenopetalum Slender-petaled thelypodium	FE	None	1B	None; no suitable habitat (alkaline meadows)
Trichostema micranthum Small-flowered bluecurls	None	None	4	High; suitable habitat
Viola pinetorum ssp. *grisea* Grey-leaved violet	None	None	1B	Low; outside known geographic range

Table 4.3 2 (cont.): Special Status Plant Species Potentially Occurring Within the Project Region

Species	Status[1]			Likelihood for Occurrence
	USFWS	CDFG	CNPS	
Status Definitions: **USFWS** FE: Species designated as endangered under the federal Endangered Species Act. Endangered = "any species in danger of extinction throughout all or a significant portion of its range." FT: Species designated as threatened under the Federal Endangered Species Act. Threatened = "species likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." FPE: Proposed for federal listing as Endangered. FPT: Proposed for federal listing as Threatened. C: Candidate for federal listing as Threatened or Endangered. SOC: Species of Concern **CDFG** ST: Threatened = "a species that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of the special protection and management efforts required by this Act" (California Endangered Species Act). SE: Endangered = "a species is endangered when its prospects of survival and reproduction are in immediate jeopardy from one or more causes." R: Rare C: Candidate for state listing as Threatened or Endangered. **CNPS** 1A Plants Presumed Extinct in California 1B Plants Rare, Threatened, or Endangered in California and Elsewhere Plants Rare, Threatened, or Endangered in California But More Common Elsewhere Plants About Which We Need More Information- A Review List Plants of Limited Distribution - A Watch List				

Special Status Plants

Eighty-one (81) special status plant species are known to occur in the project region, 30 of which occur or have a moderate or higher potential to occur on the project site. A brief description of these special status plant species are outlined below and summarized above in Table 4.3-2. Six of these special status plant species have been observed on the project site.

Parish's Rock-Cress (*Arabis parishii*). Parish's rock cress is a CNPS List 1B species that typically blooms from April to May. This perennial herb occurs in rocky, quartzite and clay, or sometimes carbonate soils in pebble plains, pinyon-juniper woodlands, and upper montane coniferous forests from approximately 3,900 to 8,000 feet above msl. It is endemic to the San Bernardino Mountains. A 2002 survey of the project site found the species was observed uncommonly in scattered patches throughout pebble plain and open Jeffrey pine forest on the project site during botanical surveys conducted in 2002 (White and Leatherman, 2002). A 2007 survey conducted by Scott White Biological Consultin, and a 2008 survey conducted by Timothy Krantz Biological Consulting reaffirmed that no changes in the species location or size have occurred.

Big Bear Valley Woollypod *(Astragalus leucolobus)*. Big Bear Valley woollypod is a CNPS List 1B species that typically blooms from May to July. This perennial herb occurs in rocky soils of lower montane coniferous forest, pebble plain, pinyon-juniper woodland, and upper montane coniferous forests from approximately 5,600 to 8,000 feet above msl. It is found in the

San Bernardino, San Gabriel, San Jacinto, and Santa Rosa mountains. This species was observed throughout the project site during botanical surveys conducted in 2002 (White and Leatherman, 2002). The 2007 White survey and 2008 Krantz reaffirmed that no changes in the species location or size have occurred.

Palmer's Mariposa Lily *(Calochortus palmeri var. palmeri)*. Palmer's mariposa lily is a CNPS List 1B species that typically blooms between May and July. This perennial, bulbiferous herb occurs in mesic chaparral, lower montane coniferous forest, meadows, and seeps from approximately 3,200 to 7,200 feet above msl. It is a California endemic found in the South Coast and Transverse ranges in Kern, Los Angeles, Riverside, Santa Barbara, San Bernardino, San Luis Obispo, and Ventura counties. This species has a moderate potential to occur on-site.

Ash-Gray Indian Paintbrush (*Castilleja cinerea*). Ash-gray Indian paintbrush is a federally-listed Threatened and CNPS List 1B species. It is a root parasite on other plants, often parasitizing the Federally-listed Threatened southern mountain buckwheat and Wright's matting buckwheat. It is a perennial herb, and typically blooms between May and August. It occurs in pebble plains, meadows, seeps, and open pinyon or Jeffrey pine forest from approximately 5,900 to 9,300 feet above msl and is endemic to the eastern San Bernardino Mountains (Big Bear Valley, Holcolmb Valley, Onyx Summit, Snow Valley, and Sugarloaf Ridge). This species was reported and mapped on the project site by MBA (MBA 2000) and the CNDDB (CDFG 2001). Botanical surveys in 2002 identified populations of this species throughout approximately 11.8 acres of pebble plain habitat and open Jeffrey pine forest in the western half of the project site. The survey also indicated that the species was parasitizing Wright's matting buckwheat. The 2007 White survey indicated that the species location and size had not change from previous surveys conducted by MBA (2000) and by White (2007). However, a survey performed in 2008 by Dr. Timothy Krantz (a year with normal precipitation) indicated that the species occurrence in the middle and western portions of the project site was significantly less in size than previously reported in surveys conducted by CNDDB, MBA and White. A total of 7.71 acres of occupied habitat occurs on the project site.

San Bernardino Mountains Dudleya *(Dudleya abramsii ssp. affinis)*. The San Bernardino Mountains dudleya is a CNPS List 1B species that typically blooms from April to June. This perennial herb occurs in granitic, quartzite, or carbonate soils of pebble plain, pinyon-juniper woodland, and upper montane coniferous forest from approximately 5,800 to 8,500 feet above msl. This species is endemic to the San Bernardino Mountains. The project site provides marginally suitable habitat for this species and the potential for occurrence is considered to be moderate.

Leafy Buckwheat (*Eriogonum foliosum*). Leafy buckwheat is a CNPS List 1B species that typically blooms from July to October. This annual herb occurs in sandy soils of chaparral, lower montane coniferous forest, and pinyon-juniper woodland from approximately 3,900 to 7,200 feet above msl. This species is found in scattered locations from Big Bear Valley south to Baja California. The

project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Jepson's Bedstraw (*Galium jepsonii*). Jepson's bedstraw is a CNPS List 4 species that typically blooms from July to August. This rhizomatous, perennial herb occurs in granitic, rocky or gravelly soils in lower and upper montane coniferous forests from approximately 6,500 to 8,100 feet above msl. This species is found in the San Gabriel and San Bernardino mountains. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Johnston's Bedstraw (*Galium johnstonii*). Johnston's bedstraw is a CNPS List 4 species that typically blooms from June to July. This perennial herb occurs in chaparral, lower montane coniferous forest, pinyon-juniper woodland, and riparian woodland from approximately 5,300 to 7,500 feet above msl. This species is found in the San Gabriel and San Bernardino mountains. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Silver-Haired Ivesia (*Ivesia argyrocoma*). Silver-haired ivesia is a CNPS List 1B species that typically blooms between June and August. This perennial herb occurs in alkaline meadows and seeps, pebble plains, and upper montane coniferous forest from approximately 4,900 to 8,800 feet above msl. It occurs in the San Bernardino Mountains and a disjunct population occurs in the mountains of Baja California. This species was reported on the project site by MBA (MBA 2000) and was observed throughout mapped pebble plain habitat on the project site during the 2002 and 2008 botanical surveys.

Duran's Rush (*Juncus duranii).* Duran's rush is a CNPS List 4 species that typically blooms from July to August. It is a rhizomatous, perennial herb that occurs in mexic soils of lower montane coniferous forest, meadows and seeps, and upper montane coniferous forest from approximately 5,800 feet to 9,000 feet above msl. This species is found in the San Bernardino, San Gabriel, and San Jacinto mountains. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Short-Sepaled Lewisia (*Lewisia brachycalyx*). Short-sepaled lewisia is a CNPS List 2 species that typically blooms from May to June. It is a perennial herb that occurs in mesic meadows and seeps, and lower montane coniferous forest from 4,500 to 7,500 feet above msl. This species is endemic to the San Bernardino Mountains. The project site provides limited suitable habitat for this species and the potential for occurrence is considered to be moderate.

Baldwin Lake Linanthus (*Linanthus killipii*). The Baldwin Lake linanthus is a CNPS List 1B species that blooms from May to July. It is an annual herb that occurs in alkaline meadows and seeps, pebble plain, pinyon-juniper woodland, and upper montane coniferous forest from approximately 5,500 to 7,800 feet above msl. This species is endemic to the San Bernardino Mountains. The

project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

San Bernardino Mountain Monkeyflower (*Mimulus exiguus*). The San Bernardino Mountain monkeyflower is a CNPS List 1B species that typically blooms from June to July. It is an annual herb that occurs in mesic, clay soils of meadows and seeps, pebble plain, and upper montane coniferous forest between approximately 5,800 and 7,500 feet above msl. This species is found in the San Bernardino Mountains and high mountains of Baja California. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Purple Monkeyflower (*Mimulus purpureus var. purpureus*). Purple monkeyflower is a CNPS List 2 species that typically blooms from May to July. It is an annual herb that occurs in meadows and seeps, pebble plain, and upper montane coniferous forest from approximately 6,100 to 7,500 feet above msl. This species is found in the San Bernardino Mountains and high mountains of Baja California. The species was first observed on site during botanical surveys in 1988 and was later found to be widely distributed among the site's pebble plain, the 4.91-acre conservation easement area, and along a draw on the eastern portion of the site, corresponding to Lot 50 (Krantz, 2008).

Chickweed Oxytheca *(Oxytheca caryophylloides).* Chickweed oxytheca is a CNPS List 4 species that typically blooms from July to September. It is an annual herb that occurs in sandy soils of lower montane coniferous forest from approximately 3,900 to 8,500 feet above msl. This species is found in the southern Sierra Nevada, Transverse Ranges, and San Jacinto Mountains. The project site provides suitable habitat for this species and the potential for occurrence is considered to be high.

Parish's Yampah (*Perideridia parishii ssp. parishii*). Parish's yampah is a CNPS List 2 species that typically blooms from June to August. It is a perennial herb that occurs in lower and upper montane coniferous forests, and meadows and seeps above approximately 6,500 feet above msl. This species is found in the San Bernardino Mountains and in disjunct populations in Arizona and New Mexico. There is a low potential for this species to occur on site.

Transverse Range Phacelia (*Phacelia exilis*). The Transverse Range phacelia is a CNPS List 4 species that typically blooms from May to August. It is an annual herb that occurs in sandy or gravelly soils in lower and upper montane coniferous forests, and meadows and seeps from approximately 3,500 to 8,500 feet above msl. This species is found in the southern Sierra Nevada and Transverse Ranges. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Mojave Phacelia (*Phacelia mohavensis*). The Mojave phacelia is a CNPS List 4 species that typically blooms from April to August. It is an annual herb that occurs in sandy or gravelly soils of cismontane woodland, lower montane coniferous forest, meadows and seeps, and pinyon-juniper woodland from approximately 4,500 to 8,100 feet above msl. This species is found in the

San Gabriel and San Bernardino mountains. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Bear Valley Phlox (*Phlox dolichantha*). The Bear Valley phlox is a CNPS List 1B species that blooms from June to July. It is a perennial herb that occurs in pebble plain and upper montane coniferous forest from approximately 6,500 to 8,800 feet above msl. This species is endemic to the San Bernardino Mountains. Although restricted to Big Bear and Holcomb Valleys, its regional distribution extends up to the summit of Sugarloag Mountain south of Big Bear Valley and as far north as White Mountain, northwest of Holcomb Valley. The taxon is fairly common within its range and is not considered to be a high priority for formal listing or more formal protection (Krantz 2008). Krantz (2008) found the species to be rather widely distributed on the project site in open black oak woodland and under Jeffrey pines.

San Bernardino Bluegrass (*Poa atropurpurea*). San Bernardino bluegrass is a Federally-listed Endangered and CNPS List 1B species that typically blooms from May to June. It is a rhizomatous, perennial herb that occurs in mesic meadows and seeps between approximately 4,800 and 7,200 feet above msl. This species is found in the San Bernardino and Laguna mountains (San Diego). The project site does not provide suitable habitat for this species and the potential to occur is considered to be low.

Bear Valley Pyrrocoma (*Pyrrocoma uniflora ssp. gosssypina*). Bear Valley pyrrocoma is a CNPS List 1B species that typically blooms from July to August. It is a perennial herb that occurs in meadows and seeps, and pebble plain from approximately 5,200 to 7,600 feet above msl. This species is endemic to the San Bernardino Mountains. The project site does not provide suitable habitat for this species and the potential to occur is considered to be low.

Parish's Rupertia (*Rupertia rigida*). Parish's rupertia is a CNPS List 4 species that typically blooms from June to July. It is a perennial herb that occurs in chaparral, cismontane woodland, and lower montane coniferous forest below approximately 8,100 feet above msl. This species is found in the San Bernardino Mountains, Peninsular Ranges, and Baja California. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Prairie Wedge Grass (*Sphenopholis obtusata).* Prairie wedge grass is a CNPS List 2 species that typically blooms from April to July. It is a perennial herb that occurs in mesic soils of cismontane woodland, meadows and seeps between approximately 1,000 and 6,550 feet above msl. This species is found in a few widely scattered locations in Amador, Fresno, Inyo, Mono, Riverside, and San Bernardino counties in California. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Laguna Mountains Jewelflower (*Streptanthus bernardinus*). The Laguna Mountains jewelflower is a CNPS List 4 species that typically blooms from June to July. It is a perennial herb that occurs in

chaparral, and lower montane coniferous forest between approximately 3,900 and 8,100 feet above msl. This species is found in the Transverse and Peninsular ranges and Baja California. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Southern Jewelflower *(Streptanthus campestris*). The southern jewelflower is CNPS List 1B species that typically blooms from May to July. It is a perennial herb that occurs in rocky soils of chaparral, lower montane coniferous forest, and pinyon-juniper woodland from approximately 2,900 to 7,500 feet above msl. This species is known from fewer than twenty occurrences in Riverside, San Bernardino, and San Diego counties, and Baja California. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Pine Green-Gentian (*Swertia neglecta)*. Pine green-gentian is a CNPS List 4 species that typically blooms from May to July. It is a perennial herb that occurs in lower and upper montane coniferous forests, and pinyon-juniper woodlands from approximately 4,500 to 8,100 feet above msl. This species is found in the South Coastal and Transverse ranges within Los Angeles, San Bernardino, and Ventura counties. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Small-Flowered Bluecurls (*Trichostema micranthum*). Small-flowered bluecurls is a CNPS List 4 species that typically blooms from July to September. It is an annual herb that occurs in mesic soils in lower montane coniferous forest and meadows and seeps from 6,500 to 7,500 feet above msl. This species is found in the San Bernardino Mountains and Baja California. The project site provides suitable habitat for this species and the potential to occur is considered to be high.

Table 4.3-3: Special Status Wildlife Species Potentially Occurring Within the Project Region

Species	Status1		Likelihood for Occurrence
	USFWS	CDFG	
Invertebrates			
Euchloe hyantis ssp. *andrewsi* Andrews' marble butterfly	SOC	C	Low; above known elevation range, limited suitable habitat
Amphibians			
Ensatina escholtzii croceater Yellow-blotched salamander	SOC	SSC	Low; limited marginally suitable habitat
Ensatina escholtzii klauberi Large-blotched salamander	SOC	SSC	None; above known elevation range, outside known geographic range
Rana muscosa Mountain yellow-legged frog	FPE	SSC	None; no suitable habitat
Scaphiopus hamondii Western spadefoot toad	SOC	SSC	None; above known elevation range
Taricha torosa torosa Coast range newt	SOC	SSC	None; no suitable habitat, above known elevation range
Reptiles			
Anniella pulchra pulchra Silvery legless lizard	SOC	SSC	Low; above known elevation range

Table 4.3-3 (cont.): Special Status Wildlife Species Potentially Occurring Within the Project Region

Species	Status1		Likelihood for Occurrence
	USFWS	CDFG	
Charina bottae umbricata Southern rubber boa	SOC	ST	Low; limited suitable habitat
Cnemidophorus tigris multiscutatus Coastal western whiptail	SOC	C	Moderate; suitable habitat
Coleonyx variegatus abbotti San Diego banded gecko	SOC	C	None; above known elevation range, no suitable habitat
Diadophis punctatus modestus San Bernardino ringneck snake	SOC	C	Low; limited suitable habitat
Lampropeltis zonata parvirubra San Bernardino Mountain kingsnake	SOC	C	Moderate; marginally suitable habitat
Lichanura trivirgata roseofusca Coastal rosy boa	SOC	C	None; above known elevation range
Phrynosoma coronatum ssp. *blainvillei* San Diego coast horned lizard	SOC	SSC/P	None; above known elevation, lack of suitable habitat
Sceloporus graciosus vendenbergianus Southern sagebrush lizard	SOC	C	Observed
Salvadora hexalepis virgultea Coast patch-nosed snake	SOC	SSC	None; lack of suitable habitat, above known elevation
Thamnophis hammondii hammondii Two-striped garter snake	C	SSC	None; no suitable habitat
Birds			
Accipiter cooperii Cooper's hawk	C	SSC	Nesting: Moderate Foraging: High
Accipiter gentilis Northern goshawk	SOC	SSC	Nesting: None Foraging: Moderate
Accipiter striatus Sharp-shinned hawk	C	SSC	Nesting: None Foraging: High in winter
Aimophila ruficeps canescens Southern California rufous-crowned sparrow	SOC	SSC	Nesting: None Foraging: None; above known elevation range
Amphispiza belli belli Bell's sage sparrow	SOC	SSC	Nesting: None Foraging: None; above known elevation range
Aquila chrysaetos Golden eagle	C	SSC	Nesting: None Foraging: High
Asio otus Long-eared owl	C	SSC	Nesting: Low Foraging: Moderate
Buteo regalis Ferruginous hawk	SOC	SSC	Nesting: None Foraging: Low in winter
Circus cyaneus Northern harrier	C	SSC	Nesting: None Foraging: Low
Cypseloides niger Black swift	C	SSC	Nesting: None Foraging: Moderate
Dendroica petechia Yellow warbler	C	SSC	Nesting: None Foraging: Moderate
Elanus leucereus White-tailed kite	C	FP	Nesting: Low Foraging: Low

Table 4.3-3 (cont.): Special Status Wildlife Species Potentially Occurring Within the Project Region

Species	Status1		Likelihood for Occurrence
	USFWS	CDFG	
Empidonax traillii extimus Southwestern willow flycatcher	FE	SE	Nesting: Low Foraging: Moderate; rare migrant
Eremophila alpestris actia California horned lark	C	SSC	Nesting: None Foraging: None; above known elevation range
Falco columbaris Merlin	C	SSC	Nesting: None Foraging: Low
Falco mexicanus Prairie falcon	C	SSC	Nesting: None Foraging: Low
Falco peregrinus anatum American Peregrine falcon	C	FE	Nesting: None Foraging : Low
Haliaeetus leucocephalus Bald eagle		SE	Observed Observed
Lanius ludovicianus Loggerhead shrike	SOC	SSC	Nesting: None Foraging: None; above known elevation range
Piranga flava Hepatic tanager	C	SSC	Nesting: Low Foraging: Low
Progne subis Purple martin	C	SSC	Nesting: Low Foraging: Low; local rarity
Strix occidentalis occidentalis California spotted owl	SOC	SSC	Nesting: Low/None observed during focused surveys Foraging: High/Observed in close proximity to project site
Vireo vicinior Gray vireo	C	SSC	Nesting: None Foraging: Low
Mammals			
Antrozus pallidus Pallid bat	C	SSC	Roosting: Low Foraging: Low
Euderma maculatum Spotted bat	SOC	SSC	Roosting: None Foraging: Moderate
Eumops perotis californicus California mastiff bat	SOC	SSC	Roosting: None Foraging: Low
Glaucomys sabrinus californicus San Bernardino Mountain flying squirrel	SOC	SSC	Breeding: Low Foraging: High
Myotis ciliolabrum Small-footed myotis	SOC	C	Roosting: Low Foraging: High
Myotis evotis Long-eared myotis	SOC	C	Roosting: High Foraging: High
Myotis lucifugus Occult little brown bat	SOC	SSC	Roosting: High Foraging: High
Myotis thysanodes Fringed myotis	SOC	C	Roosting: Low Foraging: Moderate
Myotis volans Long-legged myotis	SOC	C	Roosting: Moderate Foraging: Moderate
Myotis yumanensis Yuma myotis	SOC	C	Roosting: Low Foraging: Moderate

Table 4.3-3 (cont.): Special Status Wildlife Species Potentially Occurring Within the Project Region

Species	Status1		Likelihood for Occurrence
	USFWS	CDFG	
Onychomys torridus ramona Southern grasshopper mouse	SOC	SSC	None; no suitable habitat
Perognathus alticola alticola White-eared pocket mouse	SOC	SSC	None; presumed extinct locally
Plecotus townsendii townsendii Pacific western big-eared bat	SOC	SSC	Roosting: None Foraging: Moderate

Status Definitions:

USFWS

FE: Species designated as Endangered under the Federal Endangered Species Act. Endangered = "any species in danger of extinction throughout all or a significant portion of its range."

FT: Species designated as Threatened under the Federal Endangered Species Act. Threatened = "species likely to become an Endangered species within the foreseeable future throughout all or a significant portion of its range."

FPE: Proposed for federal listing as Endangered.

FPT: Proposed for federal listing as Threatened.

C: Candidate for federal listing as Threatened or Endangered.

SOC: Species of Concern

CDFG

SR: Rare = "a species is rare when, although not presently Threatened with extinction, it is in such small numbers throughout its range that it may become Endangered if its present environment worsens."

ST: Threatened = "a species that, although not presently Threatened with extinction, is likely to become an Endangered species in the foreseeable future in the absence of the special protection and management efforts required by this Act (California Endangered Species Act)."

SE: Endangered = "a species is endangered when its prospects of survival and reproduction are in immediate jeopardy from one or more causes."

SSC: Species of Special Concern.

FP: Fully Protected species are protected by special legislation and cannot be taken at any time.

P: Protected species are also protected by special legislation and can only be taken with a permit issued by the CDFG.

C: Candidate for state listing as Threatened or Endangered.

Special Status Wildlife

Fifty-three (53) special status wildlife species are known to occur within the region, 22 of which have a moderate or high potential to occur within the project site. Focused surveys for the bald eagle, California spotted owl, southwestern willow flycatcher, and southern rubber boa were conducted in the winter, spring, summer and fall of 2002. Additional focused surveys were conducted for the southwestern willow flycatcher and San Bernardino Mountains flying squirrel during spring and summer 2007. A brief description of the special status wildlife species that were determined to have a moderate to high potential to occur on the project site, as well as those species for which focused were conducted, is provided below and summarized in Table 4.3-3. As indicated in Table 4.3-3, two special status wildlife species (bald eagle and southern sagebrush lizard) have been observed on the project site.

Reptiles

Southern Rubber Boa (*Charina bottae umbbricata)*. The southern rubber boa is a Federal Species of Concern and State-listed Threatened species found in the San Bernardino and San Jacinto

mountains at elevations between 4,900 and 7,900 feet above msl. The majority of the localities for this species are in a 10-mile long strip of the San Bernardino Mountains between Twin Peaks in the west to Green Valley in the east. Known locations for this species occur on the north-facing slopes immediately south of Big Bear Lake. This species usually occurs in moist woodlands and coniferous forests with deep, well developed soils. It is a burrower and also commonly makes use of rock out crops for hibernation. Large downed logs and a well-developed litter layer are considered important for cover and for maintaining soil moisture. Surveys for this species were conducted in the spring and summer of 2002. An additional assessment of the project site was conducted during February 2007 by Dr. Glenn R. Stewart, PhD, Professor Eneritus of Zoology and Environmental Sciences, Cal Pol Pomona, a noted authority on the SRB (see Appendix B of this Revised and Recirculated Draft EIR). No southern rubber boas were encountered during surveys. Given the lack of historical records in the immediate vicinity of the project site, the negative results of two independent focused survey techniques, and the assessment results of Dr. Stewart, the southern rubber boa has a low potential to occur on the project site.

Coastal Western Whiptail (*Cnemidophorus tigris multiscutatus*). The coastal western whiptail is a Federal Species of Concern. It is a moderately large, slender lizard typically found in open scrub, chaparral, and woodland communities in semi-arid areas or where vegetation is sparse, from below sea level to 7,000 feet above msl. This species is restricted to the western coast of North America from Ventura County south through the northern two-thirds of the Baja California peninsula. The project site provides suitable habitat for this species; however, it is at the maximum elevation for this species and its potential to occur is considered to be moderate.

San Bernardino Mountain Kingsnake (*Lampropeltis zonata parvirubra*). The San Bernardino mountain kingsnake is a Federal Species of Concern that occurs in the San Jacinto, San Bernardino, and San Gabriel mountains. This species typically occurs in open stands of ponderosa pine, Jeffrey pine, Coulter pine, and/or black oak at elevations ranging from 4,500 to 6,500 feet above msl. This species occurs at higher elevations, but is less common. Partially shaded rock outcrops appear to be an important microhabitat element for refugia and basking sites. The project site provides marginally suitable habitat for this species and its potential to occur is considered to be moderate.

Southern Sagebrush Lizard (*Sceloporus graciosus vandenbergianus*). The southern sagebrush lizard is a Federal Species of Concern that occurs in open coniferous forests and shrubland above 3,000 feet above msl. Its known range extends from Mount Pinos south to Baja California. This species inhabits mixed conifer forest, black oak woodlands, montane chaparral, and pinyon-juniper woodlands. This species was observed frequently on the project site.

Birds

Cooper's Hawk (*Accipiter cooperii*). The Cooper's hawk is a State Species of Special Concern. Both resident and migratory populations exist in San Bernardino County. Wintering Cooper's hawks are often seen in wooded urban areas and native woodland communities. Preferred nesting habitats

include riparian forests, mountain canyons, and oak woodlands. Cooper's hawks in the region prey on small birds and rodents that live in woodland and, occasionally, scrub and chaparral communities. Breeding residents have been observed in the vicinity of Big Bear Lake. The project site provides suitable foraging habitat, but a limited amount of nesting habitat for this raptor. Therefore, its overall potential to occur is considered to be high, although the potential for nesting is moderate.

Northern Goshawk (*Accipiter gentilis*). The northern goshawk is a Federal Species of Concern and State Species of Special Concern. Rare in southern California, goshawks have been observed during the breeding season only on Mount Abel, Mount Pinos, and in the San Bernardino and San Jacinto mountains. Breeding has not been documented in the San Bernardino Mountains, although goshawks have been observed near Big Bear Lake. Goshawks occur in a variety of coniferous forest communities, including ponderosa and Jeffrey pine, mixed conifer, white fire and lodgepole pine. Large snags and downed logs are believed to be important habitat elements because they increase the abundance of small- to medium sized birds and mammals composing this species prey base. Limited suitable foraging habitat is present on the project site and the potential for this species is considered moderate for foraging, but no potential for nesting.

Sharp-shinned Hawk (*Accipiter striatus*). The sharp-shinned hawk is a State Species of Special Concern. This raptor is a fairly common winter visitor throughout southern California. It prefers woodland communities, but can also be found in virtually any habitat as it passes through the area during migration. The sharp-shinned hawk is a fairly common winter visitor in the Big Bear Lake vicinity, and its potential to occur for foraging is considered to be high. However, the project site provides no nesting habitat for this raptor.

Golden Eagle (*Aquila chryysaetos*). The golden eagle is a State Species of Special Concern. This raptor is uncommon, but widely distributed throughout foothill, lower montane, and desert montane habitats in southern California. Golden eagles nest primarily on cliffs and hunt for rabbits and other small mammals in open habitats such as grasslands, oak savannas, and open shrublands. No nesting habitat is present on the project site; however, the potential for foraging on the project site is considered high.

Long-eared Owl (*Asio otus*). The long-eared owl is a State Species of Special Concern. It breeds and roosts in riparian forests and woodlands or other dense forest habitats. This owl forages at night in open habitats including marshes, grasslands, and agricultural fields. It occurs throughout North America but is an increasingly rare breeder in southern California. The project site provides moderate suitable foraging habitat and limited nesting habitat, for this species.

Black Swift (*Cypseloides niger).* The black swift is a State Species of Special Concern. It is known to breed in the San Gabriel Mountains, Mill Creek Canyon in the San Bernardino Mountains, and the San Jacinto Mountains. This species occurs in mountain and foothill canyons where it nests in rocky cliffs behind waterfalls. No suitable nesting habitat is present on the project site; however, this

project site could provide suitable foraging habitat and the potential for this species to forage on the project site is considered moderate.

Yellow Warbler (*Dendroica petechia*). The western yellow-warbler is a California Species of Special Concern. This subspecies of yellow warbler that breeds in southern California is the western yellow warbler (*D.p. brewsteri*). This subspecies occurs in coastal areas from northwestern Washington south to western Baja California. In southern California, yellow warblers breed locally in riparian woodlands. The yellow warbler is an abundant migrant and would be expected to occur in spring and fall during migration. No suitable nesting habitat is present on the project site; however, the potential for foraging migrants on the project site is considered moderate.

Southwestern Willow Flycatcher (*Empidonax traillii extimus*). The southwestern willow flycatcher is a federally- and State-listed endangered species. This subspecies has declined drastically due to a loss of breeding habitat and nest parasitism by brown-headed cowbirds. This species occurs in riparian habitats along rivers, streams, or other wetlands where dense growths of willows (*Salix* sp.), baccharis (*Baccharis* sp.), arrowweed (*Pluchea* sp.), tamarisk (*Tamarix* sp.), or other plants are present, often with a scattered overstory of cottonwood (*Populus* sp.). The potential for this species to occur on the project site as a foraging migrant is considered to be high, but its potential to nest on the project site is considered low. Surveys for this species were conducted in the spring and summer of 2002 and again in 2007. No breeding or individual southwestern willow flycatchers were detected during the surveys. Willows along the shoreline are patchy and lack the dense growth or willow thicket favored by this species as territorial or breeding habitat. Therefore, breeding southwestern willow flycatchers are not expected to occur on the project site.

Bald Eagle (*Haliaeetus leucocephalus*). The bald eagle is a State-listed endangered species. This raptor typically overwinters in small numbers in southern California near lakes and reservoirs where they feed on fish, coots, and waterfowl. The largest known wintering population in southern California is at Big Bear Lake in the San Bernardino Mountains, where twenty to thirty eagles typically congregate from November to March. This species is known to be present on the project site in winter and could potentially nest on the project site. Surveys and records searches were conducted for the project site in the winter of 2002 and 2007 to determine bald eagle use of perch trees and favored roosting locations (refer to Appendix B of this Revised and Recirculated Draft EIR). The surveys found that the site is used extensively by bald eagles. Bald eagle perch and roost locations were recorded and individual trees were marked with numbered tags. Tree perch locations are shown on Exhibit 4.3-2. The records search confirmed extensive use of the project site by bald eagles and found that the most commonly recorded use of a single tree was also on the project site. In 2007 two bald eagle nests with potentially two pair of bald eagles were located in the Big Bear Lake area (Forest Service, June 25, 2007). One of the nests was located near Grout Bay, which is just west of the project site.

California Spotted Owl (*Strix occidentalis occidentalis*). The California spotted owl is a Federal Species of Concern and State Species of Special Concern. This species occurs in all of the major mountain ranges in southern California, although some ranges support very few pairs. It is found at elevations ranging from below 1,000 feet to 8,500 feet above msl in mature forests typically with a dense, multi-layered canopy. Its prey base consists of woodrats (i.e., *Neotoma* spp.) and other rodents. Surveys were conducted for this species on the project site in the spring and summer of 2002 (refer to Appendix B). Although one male spotted owl was detected approximately one mile to the northwest of the project site, no nesting pairs or individuals were observed on the project site. The San Bernardino National Forest has been conducting focused spotted owl surveys for the past several years and is monitoring the known breeding owls and territories which are located several miles north of the project site in the dense conifer forest. Therefore, no nesting pairs presently occur on the project site; however, individuals have a high potential to forage on the project site

Mammals

Spotted bat (*Euderma maculatum).* The spotted bat is a Federal Species of Concern that occurs throughout much of the western United States, occupying a variety of habitats from arid deserts and grasslands through mixed conifer forests Because of the low frequency of their echolocation calls large open habitat is predicted to be preferred. Spotted bats roost in the small cracks found in cliffs and stony outcrops. They feed almost entirely on moths. The project site does not provide roosting habitat but it does provide potentially suitable foraging habitat for this species.