Section 3a. Natural Resources – Air Quality

Air Quality

Air quality describes the concentration of pollutants present in the air at a particular location. For a specific location, the air quality is a direct result of how air moves through the area and how people are influencing the air through the operation of emissions sources. Air quality is an important natural resource that influences public health and welfare and quality of life. Air pollutants can adversely affect public health, visibility, native vegetation and agricultural production.

Ambient concentrations of air pollutant emissions are determined by the amount of emissions released by air pollutant sources and the atmosphere's ability to transport and dilute such emissions. Natural factors that affect transport and dilution include terrain, wind, atmospheric stability, and the presence of sunlight. Therefore, existing air quality conditions in the area are determined by such natural factors as climate, topography, and meteorology, in addition to the total emissions generated, as discussed separately below.

Greenhouse gas (GHG) emissions and energy use are often associated with air quality. These topics are addressed later in this Natural Resources Setting section.

Major Findings

- The following provides a summary of key findings for consideration in the General Plan Update. The technical background on each topic is further discussed in the sections to follow.

- In Placer County, the majority of ozone precursor (reactive organic gases [ROG] and nitrogen oxides [NO_X]) emissions come from mobile sources such as cars, trucks, and trains. Off-road mobile emissions, such as construction and agricultural equipment account for approximately 25 percent of ozone precursor emissions. The majority of particulate matter (PM) emissions within Placer County in the Sacramento Valley Air Basin (SVAB) are attributable area-wide sources associated with construction and demolition activities, as well as re-entrained roadway dust and residential fuel combustion. There are no major stationary sources (e.g., petroleum refineries, large manufacturing plants, etc.) in the Town of Loomis.

- The Town of Loomis is within the SVAB and is under the jurisdiction of the Placer County Air Pollution Control District (PCAPCD). The portion of Placer County and the SVAB in which Loomis is located is designated as a nonattainment area for ozone and particulate matter with an aerodynamic diameter of 2.5 micrometers or less (PM2.5) under the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS), and as nonattainment for particulate matter with an aerodynamic diameter of 10 micrometers or less (PM10) under the CAAQS. A nonattainment area is an area for which the State or federal standards have been exceeded for that pollutant. In order to attain the NAAQS and CAAQS in the region at the earliest practicable date, PCAPCD is required to comply with and implement the applicable air quality attainment plan.

- Naturally occurring asbestos is known to be present in several foothill areas of Placer County. However, the Town of Loomis is within an area categorized as least likely to contain naturally occurring asbestos (Department of Conservation 2006). However, asbestos may have been used during the construction of existing structures; this would be an important consideration during demolition or renovation of existing structures.

- Sources of toxic air contaminants (TACs) present within the Planning Area include dry cleaning facilities, gasoline stations, and diesel backup generators, which are subject to the rules and regulations and permitting requirements of PCAPCD. Unpermitted sources also include on-road vehicles associated with Interstate (I-) 80 and concentrated use of off-road, diesel-powered heavy-duty equipment, such as that used in agricultural production and construction sites.

Climate, Topography and Meteorology

The Loomis Planning Area is located in the SVAB, which is characterized by cool winters and hot, dry summers tempered by occasional westerly breezes from the Sacramento/San Joaquin Delta. The region has a Mediterranean climate, characterized by hot, dry summers and cool, rainy winters.

In general, the SVAB is relatively flat and bounded by the north Coast Ranges to the west and the northern Sierra Nevada to the east. Air flows into the SVAB through the Carquinez Strait, the only breach in the western mountain barrier, and moves across the Sacramento–San Joaquin Delta from the San Francisco Bay Area. The inland location and surrounding mountains typically prevent the area from experiencing much of the ocean breeze that moderates the temperatures in coastal regions. The mountains surrounding the Sacramento Valley create a barrier to air flow, which can trap in air pollutants, particularly in the autumn and early winter when large pressure cells lie over the Sacramento Valley and temperatures are low. The lack of surface wind during these periods and reduced vertical flow caused by less surface heating, reduces the influx of outside air and allows air pollutants generated within the SVAB to become concentrated in a stable volume of air. Ground concentrations are the highest when these conditions are combined with smoke from agricultural burning or forest fires or temperature inversions the trap cool air, fog, and pollutants near the ground. Alternatively, winds and unstable atmospheric conditions associated with the passage of winter storms result in periods of low air pollution and excellent visibility.

Characteristic of the winter months in the SVAB are periods of dense and persistent low-level fog, which are most prevalent between storms. This precipitation and fog also tend to reduce or limit some pollutant concentrations. However, between winter storms, high pressure and light winds contribute to low-level temperature inversions and stable atmospheric conditions, resulting in the concentration of air pollutants.

May through October is ozone season in the SVAB and is characterized by poor air movement in the mornings and the arrival of the Delta sea breeze from the southwest in the afternoons. In addition, with the longer daylight hours, a larger amount of sunlight is available to fuel photochemical reactions between volatile organic compounds (VOC) and NO_X, which in turn result in ozone formation. Typically, the Delta breeze transports air pollutants northward out of the SVAB. However, during approximately half of the time from July to September, a phenomenon known as the Schultz Eddy prevents this from occurring. The Schultz Eddy phenomenon causes winds on the west side of the SVAB to shift to a northerly wind, blowing air pollutants southward back into the SVAB. This phenomenon exacerbates the concentration of air pollutant emissions in the air basin and can contribute to violations of ambient air quality standards.

Criteria Air Pollutants

There are many pollutants present in the atmosphere, although most are not a significant public health concern in the Planning Area. California Air Resources Board (ARB) and the U.S. Environmental Protection Agency (EPA) have identified six air pollutants as being indicators of ambient air quality: ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), PM (often analyzed separately as PM_{10} and $PM_{2.5}$), and lead. Because the ambient air quality standards for these air pollutants are regulated using human health and environmentally based criteria, they are commonly referred to as “criteria air pollutants.” Criteria air pollutants of concern in the Planning Area are summarized below.

Ozone

Ozone is the most common component of smog and is the principal pollutant that causes adverse health effects. Ozone is toxic and colorless, and has a pungent odor. In high concentrations, ozone and other photochemical oxidants are directly detrimental to humans by causing respiratory irritation and possible alterations in the functioning of the lungs. Ozone and other oxidants can also enter the leaves of plants and reduce photosynthesis, which is the process that plants use to convert sunlight to energy to live and grow.

Ozone is not emitted directly into the air but is formed through a series of reactions involving ROG and NO_X in the presence of sunlight. These chemicals are considered to be precursors of ozone, as their reaction leads to its formation. ROG emissions result primarily from incomplete combustion and the evaporation of chemical solvents and fuels. NO_X includes various combinations of nitrogen and oxygen, including nitric oxide, NO_2, and others, typically resulting from the combustion of fuels.

Emissions of both ROG and NO_X are considered critical to ozone formation; therefore, either ROG or NO_X can limit the rate of ozone production. When the production rate of NO_X is lower, indicating that NO_X is scarce, the rate of ozone production is NO_X-limited. Under these circumstances, ozone levels could be most effectively reduced by lowering current and future NO_X emissions (from fuel combustion), rather than by lowering ROG emissions. Rural areas tend to be NO_X-limited, while areas with dense urban populations tend to be ROG-limited. Both ROG and NO_X reductions provide ozone benefits in the region, but the Sacramento Federal Nonattainment Area, which includes Placer County, exhibits a NO_X-limited regime; therefore, NO_X reductions (such as those available through reducing mobile source emissions) are more effective than ROG reductions on a tonnage basis (SMAQMD 2017).

Ozone concentrations reflect an interplay of emissions of ozone precursors, transport, meteorology, and atmospheric chemistry. Meteorology and terrain play a major role in ozone formation. Generally, low wind speeds or stagnant air, coupled with warm temperatures and clear skies provide the optimum conditions for formation. As a result, summer is generally the peak ozone season. Because of the reaction time involved, peak ozone concentrations often occur far downwind of the precursor emissions. Therefore, ozone is a regional pollutant that often affects large areas.

Individuals exercising outdoors, children, and people with lung disease, such as asthma and chronic pulmonary lung disease, are considered to be the most susceptible subgroups for ozone effects. Short-term ozone exposure (lasting for a few hours) can result in changes in breathing patterns, reductions in breathing capacity, increased susceptibility to infections, inflammation of lung tissue, and some immunological changes. A correlation has also been reported between elevated ambient ozone levels and increases in daily hospital admission rates and mortality (EPA 2020a). An increased risk of asthma has been found in children who participate in multiple sports and live in communities with high ozone levels.

Emissions of the ozone precursors ROG and NO_X have decreased in the past several years. According to the most recently published edition of ARB's California Almanac of Emissions and Air Quality, NO_X and ROG emissions levels in the Sacramento metropolitan area (inclusive of the southern portion of the SVAB, as well as the western portions of El Dorado and Placer counties, within which the Planning Area is located) are projected to continue to decrease through 2035, largely because of more stringent motor vehicle standards and cleaner burning fuels, as well as rules for controlling ROG emissions from industrial coating and solvent operations (ARB 2013).

Carbon Monoxide

CO is a colorless and odorless gas that is primarily produced by the incomplete burning of carbon in fuels such as natural gas, gasoline, and wood, and is emitted by a wide variety of combustion sources, including on-road and non-road mobile sources, wood-burning stoves, incinerators, industrial sources, and wildfires. On-road and non-road mobile sources account for approximately 38 percent and 26 percent, respectively, of all CO emissions nationwide (EPA 2020b). Relatively high concentrations are typically

found near crowded intersections and along heavily used roadways carrying slow-moving traffic. Even under the most severe meteorological and traffic conditions, high concentrations of CO are limited to locations within a relatively short distance (300 to 600 feet) of heavily traveled roadways. Vehicle traffic emissions can cause localized CO impacts, and severe vehicle congestion at major signalized intersections can generate elevated CO levels, called "hot spots," which can be hazardous to human receptors adjacent to the intersections.

Adverse health effects associated with exposure to high CO concentrations, typically only attainable indoors or within similarly enclosed spaces, include dizziness, headaches, and fatigue. CO exposure is especially harmful to unborn babies, infants, elderly people, and people with anemia or with a history of heart or respiratory disease (ARB 2020a).

Nitrogen Dioxide

NO_2 is one of a group of highly reactive gases known as oxides of nitrogen, or NO_X. NO_2 is formed when ozone reacts with nitric oxide (i.e., NO) in the atmosphere and is listed as a criteria pollutant because NO_2 is more toxic than nitric oxide. The major human-made sources of NO_2 are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. The combined emissions of nitric oxide and NO_2 are referred to as NO_X and reported as equivalent NO_2. Because NO_2 is formed and depleted by reactions associated with ozone, the NO_2 concentration in a geographical area may not be representative of local NO_X emission sources. NO_X also reacts with water, oxygen, and other chemicals to form nitric acids, contributing to the formation of acid rain.

Inhalation is the most common route of exposure to NO_2. Breathing air with a high concentration of NO_2 can lead to respiratory illness. Short-term exposure can aggravate respiratory diseases, particularly asthma, resulting in respiratory symptoms (such as coughing, wheezing, or difficulty breathing), hospital admissions, and visits to emergency rooms. Longer exposures to elevated concentrations of NO_2 may contribute to the development of asthma and potentially increase susceptibility to respiratory infections. Larger decreases in lung functions are observed in individuals with asthma or chronic obstructive pulmonary disease (e.g., chronic bronchitis, emphysema) than in healthy individuals, indicating a greater susceptibility of these subgroups (EPA 2016).

Sulfur Dioxide

SO_2 is one component of the larger group of gaseous oxides of sulfur (SO_X). SO_2 is used as the indicator for the larger group of SO_X, as it is the component of greatest concern and found in the atmosphere at much higher concentrations than other gaseous SO_X. SO_2 is typically produced by such stationary sources as coal and oil combustion facilities, steel mills, refineries, and pulp and paper mills. The major adverse health effects associated with SO_2 exposure pertain to the upper respiratory tract. On contact with the moist mucous membranes, SO_2 produces sulfurous acid, a direct irritant. Concentration rather than duration of exposure is an important determinant of respiratory effects. Children, the elderly, and those who suffer from asthma are particularly sensitive to effects of SO_2 (EPA 2019).

SO_2 also reacts with water, oxygen, and other chemicals to form sulfuric acids, contributing to the formation of acid rain. SO_2 emissions that lead to high concentrations of SO_2 in the air generally also lead to the formation of other SO_X, which can react with other compounds in the atmosphere to form small particles, contributing to particulate matter pollution, which can have health effects of its own.

Particulate Matter

Particulate matter refers to a complex mixture of small solid matter and fine droplets (aerosols) made up of several components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. The major area-wide sources of $PM_{2.5}$ and PM_{10} are fugitive dust, especially from

roadways, agricultural operations, and construction and demolition. Other sources of PM_{10} include crushing or grinding operations. $PM_{2.5}$ sources also include all types of combustion, including motor vehicles, power plants, residential wood burning, forest fires, agricultural burning, and some industrial processes. Exhaust emissions from mobile sources contribute only a very small portion of directly emitted $PM_{2.5}$ and PM_{10} emissions. However, they are a major source of ROG and NO_X, which undergo reactions in the atmosphere to form PM, known as secondary particles. These secondary particles make up the majority of PM pollution.

The size of PM is directly linked to its potential for causing health problems. EPA is concerned about particles that are 10 micrometers in diameter or smaller, because these particles generally pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects, even death. The adverse health effects of PM_{10} depend on the specific composition of the particulate matter. For example, health effects may be associated with metals, polycyclic aromatic hydrocarbons, and other toxic substances adsorbed onto fine PM (referred to as the "piggybacking effect"), or with fine dust particles of silica or asbestos. Effects from short- and long-term exposure to elevated concentrations of PM_{10} include respiratory symptoms, aggravation of respiratory and cardiovascular diseases, a weakened immune system, and cancer (World Health Organization 2018).

$PM_{2.5}$ poses an increased health risk because these very small particles can be inhaled deep in the lungs and may contain substances that are particularly harmful to human health. Direct emissions of $PM_{2.5}$ in the Sacramento metropolitan area decreased between 2000 and 2010, but are projected to increase very slightly through 2035. Similarly, emissions of diesel particulate matter (DPM) decreased from 2000 through 2010 because of reduced exhaust emissions from diesel mobile sources. These emissions are anticipated to continue to decline through 2035 (ARB 2013).

Lead

Lead is a highly toxic metal that may cause a range of human health effects. Lead is found naturally in the environment and is used in manufactured products. Previously, the lead used in gasoline anti-knock additives represented a major source of lead emissions to the atmosphere. Soon after its inception, EPA began working to reduce lead emissions, issuing the first reduction standards in 1973. Lead emissions have decreased substantially as a result of the near elimination of leaded gasoline use. Metal processing is currently the primary source of lead emissions. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufacturers. Although the ambient lead standards are no longer violated, lead emissions from stationary sources still pose "hot spot" problems in some areas. As a result, ARB has identified lead as a toxic air contaminant (TAC).

Fetuses, infants, and children are more sensitive than others to the adverse effects of lead exposure. Exposure to low levels of lead can adversely affect the development and function of the central nervous system, leading to learning disorders, distractibility, inability to follow simple commands, and lower intelligence quotients. In adults, increased lead levels are associated with increased blood pressure. Lead poisoning can cause anemia, lethargy, seizures, and death, although it appears that lead does not directly affect the respiratory system.

Regional Ambient Air Quality

Both the EPA and the ARB have established air quality standards for the criteria air pollutants, based on consideration of the health and welfare of the general public. The NAAQS and the CAAQS are summarized in Table 3-1. In addition to standards for the criteria air pollutants, California has also set CAAQS for visibility reducing particles, sulfates, hydrogen sulfide, and vinyl chloride. These health-based pollutant standards are reviewed with a legally prescribed frequency and are revised, as warranted, by new data on health and welfare

Table 3-1: Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards [a,c]	Primary National Standards [b,c,d]	Secondary National Standards [b,c,e]
Ozone[f]	1-Hour 8-Hour	0.09 ppm (180 µg/m^3) 0.07 ppm (137 µg/m^3)	--- 0.07 ppm (137 µg/m^3)	Same as primary standard
Carbon Monoxide (CO)	1-Hour 8-Hour	20 ppm (23 mg/m^3) 9.0 ppm (10 mg/m^3)	35 ppm (40 mg/m^3)9.0 ppm (10 mg/m^3)	---
Nitrogen Dioxide (NO_2) [g]	1-Hour Annual Arithmetic Mean	0.18 ppm (339 µg/m^3) 0.030 ppm (57 µg/m^3)	100 ppb (188 µg/m^3) 0.053 ppm(100 µg/m^3)	--- Same as Primary Standard
Sulfur Dioxide (SO_2) [h]	24-Hour 3-Hour 1-Hour	0.04 ppm (105 µg/m^3) --- 0.25 ppm (655 ug/m^3)	--- --- 75 ppb (196 µg/m^3)	--- 0.5 ppm (1,300 µg/m^3) ---
Inhalable Particulate Matter (PM_{10}) [i]	24-Hour Annual Arithmetic Mean	50 µg/m^3 20 µg/m^3	150 µg/m^3 ---	Same at Primary Standard ---
Fine Particulate Matter ($PM_{2.5}$) [i]	Annual Arithmetic Mean 24-Hour	12.0 µg/m^3 ---	12.0 µg/m^3 35.0 µg/m^3	15.0 µg/m^3 Same as Primary Standard
Lead	30-Day Average Rolling 3-Month Average	1.5 µg/m^3 ---	--- 0.15 µg/m^3	--- Same as Primary Standard
Visibility-reducing Particles [l]	8-Hour	See footnote 1	No National Standards	
Sulfates	24-Hour	25 µg/m^3		
Hydrogen Sulfide	1-Hour	0.03 ppm (42 µg/m^3)		
Vinyl Chloride [j]	24-Hour	0.01 ppm (26 µg/m^3)		

Notes: µg/m^3 = micrograms per cubic meter; mg/m^3 = milligrams per cubic meter; ppb = parts per billion; ppm = parts per million

[a] California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1- and 24-hour), nitrogen dioxide, and particulate matter (PM_{10}, $PM_{2.5}$, and visibility-reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[b] National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than 1. For $PM_{2.5}$, the 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standards.

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

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

[e] National Secondary Standards: Levels of air quality necessary to protect public welfare from any known or anticipated adverse effects of a pollutant.

[f] On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.

[g] To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. California standards are in units of ppm. To directly compare the national 1-hour standard to the California standards, the units can be converted from 100 ppb to 0.100 ppm.

[h] On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until 1 year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved. To directly compare the 1-hour national standard to the California standard, the units can be converted to ppm. In this case, the national standard of 75 ppb is identical of 0.075 ppm.

[i] On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 µg/m^3 to 12.0 µg/m^3. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 µg/m^3, as was the annual secondary standard of 15 µg/m^3. The existing 24-hour PM_{10} standards (primary and secondary) of 150 µg/m^3 also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

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

[k] The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 µg/m^3 as a quarterly average) remains in effect until 1 year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standards are approved.

[l] In 1989, ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and the "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

Source: ARB 2020b

effects. Each standard is based on a specific averaging time over which the concentration is measured. Different averaging times are based on protection from short-term, high-dosage effects or longer term, low-dosage effects.

Air Quality Attainment Status

The Federal and California Clean Air Acts require identification and classification of each state air basin as attainment, nonattainment, or unclassified based on the NAAQS and CAAQS. An attainment designation for a particular pollutant indicates that available ambient monitoring data have shown that the NAAQS or CAAQS for that pollutant have not been violated (or exceeded). A nonattainment designation for a given pollutant indicates that the standards have been exceeded for that pollutant. An unclassified designation indicates that insufficient ambient monitoring data are available to determine whether or not there have been violations of the NAAQS or CAAQS for the pollutant in question. For regulatory purposes, an unclassified area is generally treated the same as an attainment area.

Table 3-2 provides the attainment status for each pollutant in the Sacramento Valley Air Basin. The Planning Area is in non-attainment for ozone and $PM_{2.5}$ based on both State and federal standards. For PM_{10}, it is in nonattainment for the State standard only. The Planning Area is in attainment or unclassified for all other pollutants.

Table 3-2: Attainment Status of the Sacramento Valley Air Basin

Pollutant	Averaging Time	Federal Status	State Status
Ozone	1-Hour	---	Nonattainment
Ozone	8-Hour	Nonattainment	Nonattainment
Carbon Monoxide (CO)	1-Hour	Attainment	Attainment
Carbon Monoxide (CO)	8-Hour	Attainment	Attainment
Nitrogen Dioxide (NO_2)	1-Hour	Unclassified	Attainment
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	Attainment	Attainment
Sulfur Dioxide (SO_2)	24-Hour	Attainment	Attainment
Sulfur Dioxide (SO_2)	3-Hour	Attainment	Attainment
Sulfur Dioxide (SO_2)	1-Hour	Attainment	Attainment
Respirable Particulate Matter (PM_{10})	24-Hour	Attainment	Nonattainment
Respirable Particulate Matter (PM_{10})	Annual Arithmetic Mean	---	Nonattainment
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	Attainment	Nonattainment
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	Nonattainment	---
Lead	30-Day Average	Attainment	Attainment
Lead	Rolling 3-Month Average	Attainment	Attainment
Visibility-reducing Particles	8-Hour	No National Standards	Unclassified
Sulfates	24-Hour	No National Standards	Attainment
Hydrogen Sulfide	1-Hour	No National Standards	Unclassified
Vinyl Chloride	24-Hour	No National Standards	Unclassified

Source: ARB 2020c, EPA 2020c. Data compiled by AECOM.

Toxic Air Contaminants

In addition to criteria pollutants, both federal and State air quality regulations also focus on TACs. A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may otherwise pose a hazard to human health. The health risks of individual toxic air contaminants vary greatly; at a given level of exposure, one toxic air contaminant may pose a hazard that is many times greater than another. TACs are identified and their toxicity is studied by the California Office of Environmental Health Hazard Assessment (OEHHA). TACs are usually present in minute quantities in the ambient air; however, their toxicity or health risk may pose a threat to public health even at low concentrations. TACs can be separated into carcinogens and noncarcinogens, based on the nature of the effects associated with exposure to the pollutant. For regulatory purposes, carcinogens are assumed to have no safe threshold below which health impacts would not occur. Noncarcinogens differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is believed to occur.

Stationary sources of TACs include gasoline stations, dry cleaners, and diesel backup generators, among which are subject to PCAPCD permit requirements. On-road motor vehicles and off-road sources, such as construction equipment and trains, are also common sources of TACs. In terms of health risks, the most volatile contaminants are DPM, benzene, formaldehyde, 1,3-butadiene and acetaldehyde. Gasoline vapors contain several TACs, including benzene, toluene, and xylenes. Public exposure to TACs can result from emissions from normal operations, as well as accidental releases.

$PM_{2.5}$ and DPM exposure is strongly associated with mortality, respiratory diseases, and lung development in children, and other endpoints such as hospitalization for cardiopulmonary disease. ARB identified DPM as a TAC in 1998 based on data developed and reviewed by the OEHHA and ARB in the scientific risk assessment on exposure to diesel exhaust and its health effects (ARB 1998). Other agencies, such as the National Toxicology Program, the EPA and the National Institute of Occupational Safety and Health, concluded that exposure to diesel exhaust likely causes cancer. More recently, the World Health Organization's International Agency for Research on Cancer classified diesel engine exhaust as carcinogenic to humans (Group 1), an increase from the prior 1998 classification by the International Agency for Research on Cancer (IARC) as probably carcinogenic to humans (Group 2A) (World Health Organization 2012). According to the 2009 California Almanac of Emissions and Air Quality (California Air Resources Board 2009), the majority of the estimated health risk from TACs can be attributed to relatively few compounds, the most important being diesel PM. Diesel PM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances. Although diesel PM is emitted by diesel-fueled internal-combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emission control system is present.

Diesel powered engines, including locomotive engines and heavy-duty diesel-powered vehicles, represent a major source of DPM in California. Because locomotive engines and heavy-duty diesel-powered vehicles emit DPM during operations, areas where locomotive engines are operated in place/idle frequently or for long periods of time, and areas in proximity to high-volume freeways can experience increased atmospheric concentrations of DPM. Consequently, the ARB considers railyards and high-volume freeways to be substantial sources of TACs. The Planning Area does not contain a railyard, distribution centers, or other such substantial sources of DPM. The Union Pacific Railroad does traverse the Planning Area; however, DPM emissions from locomotives traveling along railroads are intermittent and dispersed, and therefore do not pose the same health risk as concentrated sources such as a railyard. I-80, a high-volume freeway, runs southeast to northwest through the Planning Area and is considered a potential source of DPM and gasoline-related TACs.

Asbestos is the name given to several naturally occurring fibrous silicate minerals. Asbestos has been mined for applications requiring thermal insulation, chemical and thermal stability, and high tensile strength. Asbestos is also found in its natural state in rock or soil (known as naturally occurring asbestos), typically in ultramafic or serpentine rock formations. Naturally occurring asbestos is known to be present in several foothill areas of Placer County, but according to the Special Report 190: Relative Likelihood for the Presence of Naturally Occurring Asbestos in Placer County, California prepared by the Department of Conservation (2006), the Town of Loomis is within an area categorized as least likely to contain naturally occurring asbestos, because faults and serpentinite outcroppings are not known to be in the Planning Area. However, asbestos may have been used during the construction of existing structures, which should be considered when such structures are proposed for demolition.

Odors

The ability to detect odors varies considerably among the population and is subjective. Some individuals can smell minute quantities of specific substances, while others may not have the same sensitivity but may be sensitive to odors of other substances. In addition, people may have different reactions to the same odor; an odor that is offensive to one person (e.g., from a fast-food restaurant or bakery) may be perfectly acceptable to another. Unfamiliar odors may be more easily detected and likely to cause complaints than familiar ones.

Several examples of common land uses that generate substantial odors are wastewater treatment plants, landfills, composting/green waste facilities, recycling facilities, petroleum refineries, chemical manufacturing plants, painting/coating operations, rendering plants, and food packaging plants. In addition, odors can be caused by agricultural activities, such as dairy operations; horse, cattle, or sheep (livestock) grazing; fertilizer use; and aerial crop spraying.

Offensive odors can affect human health in several ways. First, odorant compounds can irritate the eye, nose, and throat, which can reduce respiratory volume. Second, the VOCs that cause odors can stimulate sensory nerves to cause neurochemical changes that might influence health, for instance, by compromising the immune system. Finally, unpleasant odors can trigger memories or attitudes linked to unpleasant odors, causing cognitive and emotional effects, such as stress.

No single source of substantial odors is identified in the Planning Area. However, the Loomis area supports substantial agricultural uses, often in close proximity to residences and other odor-sensitive land uses. Typical odors from such uses include manure from livestock and fertilizer for crop production, which are often perceived as objectionable. Consequently, while odors are not an acute problem within the Planning Area, they may be considered substantial by some especially sensitive area residents.

Regulatory Framework

Air pollution control is administered on three government levels in California: Federal (EPA), State (ARB), and local PCAPCD. The PCAPCD administers air pollution control programs in Placer in consultation with the EPA and ARB.

Federal

Clean Air Act and Ambient Air Quality Standards

The primary legislation that governs federal air quality regulations is the California Clean Air Act (CCAA), enacted in 1970 and amended by Congress most recently in 1990. The CAA delegates primary responsibility for clean air to EPA. EPA develops rules and regulations to preserve and improve air quality and delegates specific responsibilities to state and local agencies. The CAA directs EPA to establish federal air quality standards, known as NAAQS for six criteria air pollutants: ozone, CO, PM

(both PM_{10} and $PM_{2.5}$), SO_2, NO_2 and lead. NAAQS include both primary and secondary standards; the former are set to protect public health with an adequate margin of safety, the latter to prevent degradation to the environment (e.g., impairment of visibility, damage to vegetation). Table 3-1 above summarizes NAAQS currently in effect for each criteria air pollutant.

The CAA places most of the responsibility on states to achieve compliance with NAAQS. Each state is required to submit and implement an air quality control plan, referred to as a State Implementation Plan (SIP) for local areas not meeting NAAQS. The SIP must include pollution control measures that demonstrate how the standards will be met by the dates specified in the CAA. The SIP is periodically modified to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. EPA is responsible for reviewing all SIPs to determine whether they conform to the mandates of the CAA and its amendments and to determine whether implementing them will achieve ambient air quality standards. If EPA determines a SIP to be inadequate, a federal implementation plan that imposes additional control measures may be prepared for the nonattainment area. Failure to submit an approvable SIP or to implement the plan within the mandated time frame may result in sanctions to transportation funding and stationary air pollution sources in the air basin.

In California, EPA has delegated authority to prepare SIPs to ARB, which, in turn, has delegated that authority to individual air districts. ARB traditionally has established state air quality standards, maintaining oversight authority in air quality planning, developing programs for reducing emissions from motor vehicles, developing air emissions inventories, collecting air quality and meteorological data, and approving SIPs.

Locomotive Emissions Standards

In March 2008, EPA adopted a three-part emissions standard program to reduce emissions from diesel locomotives over time. The regulation tightens emission standards for existing, remanufactured locomotives, and sets exhaust emission standards for newly build locomotives of model years 2011-2014 (Tier 3) and 2015 and beyond (Tier 4). The regulation is expected to reduce PM emissions from locomotive engines by as much as 90 percent and NO_X emissions by as much as 80 percent when fully implemented.

State

Assembly Bill 2595, known as the CCAA took effect on January 1, 1989. The goal of this bill is to attain the CAAQS by the earliest practicable date. The CCAA requires that air quality plans be prepared for areas of the state that have not met state air quality standards for O_3, CO, NO_2, and SO_2. Among other requirements of the CCAA, the plans must include a wide range of implementable control measures, which often include transportation control measures and performance standards. In order to implement the transportation-related provisions of the CCAA, local air pollution control districts have been granted explicit authority to adopt and implement transportation control measures. The applicable AQAP for Placer County is discussed below with regard to the PCAPCD.

California Code of Regulations

Title 13 regulates motor vehicles.

Chapters 3.5 and 3.6 require that all heavy-duty vehicles powered by a diesel engine and operating on California highways, submit to a smoke emissions test. Vehicles with 1991 or newer model-year diesel engines may not exceed an opacity level of more than 40 percent. Vehicles with 1990 or older model-year diesel engines may not exceed an opacity level of 55 percent.

Chapter 9 regulates off-road vehicles and engine pollution control devices. Article 4.8 regulates diesel fleet emissions. The contractor shall use ARB ultra-low-sulfur diesel fuel for all diesel-powered equipment. In addition, low sulfur fuel shall be utilized for all stationary equipment. Targets for each year between 2011 and 2020 are mandated for particulate matter emissions. A large or medium fleet must meet a DPM index that is less than or equal to the calculated target rates. Small fleets will be required to comply with DPM averages starting in 2020. Article 5, the California Portable Equipment Registration Program, regulates portable equipment and requires that such equipment be registered with the air district. Registered portable engines shall not exceed the following emission limits:

- 550 pounds per day per engine of CO
- 150 pounds per day per engine of particulate matter less than 10 microns
- For registered portable engines operating onshore, 10 tons for each pollutant per district per year per engine for NO_X, SO_X, VOC, PM_{10} and CO in non-attainment areas.

Chapter 10 regulates mobile source operations and includes provisions to address airborne toxics from diesel-fueled off- and on-road vehicles. Sections 2449 and 2485 limit idling time to a maximum of 5 minutes for off-road diesel-fueled construction vehicles heavy-duty commercial diesel vehicles (defined as diesel vehicles heavier than 10,000 pounds gross vehicle rated weight) and, respectively.

Title 17, Section 93105, codifies the Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations. Each air pollution control and air quality management district are required to implement and enforce the requirements of Section 93105 to minimize asbestos-containing dust.

Title 20 requires manufacturers of appliances to meet State and federal standards for energy and water efficiency. Performance of appliances must be certified through the California Energy Commission to demonstrate compliance with standards.

Title 24 serves to enhance and regulate California's building standards.

Part 6, establishes building energy efficiency standards that save energy, increase electricity supply reliability, increase indoor comfort, and help preserve the environment.

Part 11, the California Green Building Standards Code, commonly referred to as CALGreen, set minimum mandatory standards as well as voluntary standards pertaining to the planning and design of sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and interior air quality.

Regional and Local

Placer County Air Pollution Control District

PCAPCD attains and maintains air quality conditions in Placer County through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. PCAPCD inspects stationary sources of air pollution, responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements programs and regulations required by the CAA, CAAA, and CCAA. The clean-air strategy of PCAPCD includes preparing plans and programs for the attainment of ambient air quality standards, adopting and enforcing rules and regulations concerning sources of air pollution, and issuing permits for stationary sources of air pollution. The rules and regulations include procedures and requirements to control the emission of pollutants and to prevent adverse impacts.

All projects within PCAPCD's jurisdictional area are subject to PCAPCD rules and regulations in effect at the time of construction. Specific PCAPCD rules that could be applicable to projects implemented under the General Plan Update may include but are not limited to the following:

- Rule 202: Visible Emissions. A person shall not discharge into the atmosphere from any single source of emissions whatsoever any air contaminant for a period or periods aggregating more than three minutes in any one hour which is as dark or darker in shade as that designated as number 1 on the Ringelmann Chart, as published by the U.S. Bureau of Mines.

- Rule 205: Nuisance. A developer and proposed project cannot emit any quantities of air contaminants or other materials that would cause injury, detriment, nuisance, or annoyance to any considerable number of persons or the public; or that would endanger the comfort, repose, health, or safety of any persons or the public; or that would cause or have natural tendency to cause injury or damage to business or property.

- Rule 217: Cutback and Emulsified Asphalt Paving Materials. The developer or contractor is required to use asphalt paving materials that comply with the VOC content limits specified in the rule.

- Rule 218: Architectural Coatings. The developer or contractor is required to use coatings that comply with the content limits for VOCs specified in the rule.

- Rule 225: Wood Burning Appliances. No person shall sell or supply new wood burning appliances unless it is an EPA phase II Certified wood burning appliance, pellet-fueled wood burning heater, masonry heater, or determined to meet the EPA standard for PM emissions standards.

- Rule 228: Fugitive Dust. The developer or contractor is required to control dust emissions from earthmoving activities or any other construction activity to prevent airborne dust from leaving the project site.

- Rule 246: Natural Gas-Fired Water Heaters. A person shall not distribute, offer for sale, sell, or install, any natural gas-fired water heater within the District, unless it is a natural gas-fired water heater that emits less than or equal to 40 nanograms of nitrogen oxides [calculated as NO_2] per joule (93 pounds per billion British thermal unit [BTU]) of heat output; and is certified in accordance with Section 402 of Rule 246 or it is a mobile home natural gas-fired water heater that emits less than or equal to 50 nanograms of nitrogen oxides [calculated as NO_2] per joule (116 pounds per billion BTU) of heat output; and is certified in accordance with Section 402 of Rule 246.

- Rule 247: Natural Gas–fired Water Heaters, Small Boilers, and Process Heaters. If a proposed project would install natural gas-fired units (i.e., boilers, steam generators, and process heaters) with a rated heat input capacity greater than or equal to 75,000 BTU [British thermal units] and less than 5 million Btu per hour, the unit is required to comply with the NO_X and CO emissions standards.

- Rule 305: Residential Allowable Burning. Except as provided in Regulation 3, no person shall use an open outdoor fire (including the use of a burn barrel) for the purposes of disposal or burning of any disallowed combustibles. Only allowable combustibles, originating at a residence, and free of disallowed combustibles, and reasonably free from dirt, soil, and visible surface moisture, may be burned in an open outdoor burn pile. Burning in a burn barrel is prohibited.

- Rule 501: General Permit Requirements. To provide an orderly procedure for the review of new sources of air pollution and modification and operation of existing sources through the issuance of permits. Any project that includes the use of equipment capable of releasing emissions to the atmosphere may be required to obtain permit(s) from PCAPCD before equipment operation.

- Rule 507: Federal Operating Permit Program. Stationary sources subject to Rule 507 include major stationary sources, acid rain units subject to Title IV of the CAA, solid waste incinerators subject to Section 111 or 129 of the CAA, and any other stationary sources specifically designated by rule of the EPA.

PCAPCD has also produced a guidebook called the CEQA Air Quality Handbook (PCAPCD Handbook), which contains guidance for analyzing construction and operational emissions (PCAPCD 2017). The PCAPCD Handbook also includes a list of analysis expectations and methodologies for CEQA analyses. On October 13, 2016, the PCAPCD Board of Directors adopted the Review of Land Use Projects under CEQA Policy, which includes recommendations for thresholds of significance for criteria air pollutant emissions. In developing the thresholds, PCAPCD took into account health-based air quality standards and the strategies to attain air quality standards, historical CEQA project review data in Placer County, and the geographic and land use features of Placer County.

Because portions of Placer County do not attain the federal ozone and PM air quality standards, PCAPCD is responsible for working with the other air districts within the Sacramento Region to develop applicable air quality plans. As part of the Sacramento Federal Nonattainment Area for ozone, and in accordance with requirements under the Clean Air Act (CAA), PCAPCD worked with the other local air districts within the Sacramento area to develop a regional air quality management plan to describe and demonstrate how Placer County, as well as the Sacramento nonattainment area, is meeting requirements under the federal CAA in demonstrating reasonable further progress and attainment of the NAAQS for ozone (PCAPCD 2019). PCAPCD held a public hearing to consider, and ultimately adopted, the 2017 Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan (Ozone Attainment and Progress Plan). The Ozone Attainment and Progress Plan documents how the region Some elements of the Ozone Attainment and Progress Plan were updated in 2018 and included in the 2018 Updates to the California State Implementation Plan, which updated SIP elements for nonattainment areas throughout the state, as needed. These updates were adopted by ARB in October 2018. The Ozone Attainment and Progress Plan is the currently adopted and applicable air quality plan for the region and, therefore, PCAPCD is required to comply with and implement this plan.

Similarly, PCAPCD also adopted the 2013 $PM_{2.5}$ Implementation and Maintenance Plan and Redesignation Request for Sacramento $PM_{2.5}$ Nonattainment Area ($PM_{2.5}$ Maintenance Plan and Redesignation Request) to address how the region attained and would continue to attain the 24-hour $PM_{2.5}$ NAAQS. In 2017, EPA found that the area attained the 2006 24-hour $PM_{2.5}$ NAAQS by the attainment date of December 31, 2015. The $PM_{2.5}$ Maintenance Plan and Redesignation Request will be updated and submitted in the future based on the clean data finding made by the EPA.

In compliance with the requirements set forth in the CCAA, which specifically addressed the non-attainment status for ozone, CO, $PM_{2.5}$ and PM_{10}, PCAPCD coordinated with the air quality management districts and air pollution control districts of El Dorado, Sacramento, Solano, Sutter, and Yolo counties to prepare and submit the 1991 Air Quality Attainment Plan (AQAP). The CCAA also requires a triennial assessment of the extent of air quality improvements and emission reductions achieved through the use of control measures. In accordance with this requirement, PCAPCD has prepared several triennial progress reports that build upon the AQAP. The most recently adopted report is the 2018 Triennial Progress Report for the 2015-2017 period.

Local and Regional Transportation Planning

Because transportation is one of the most substantial emissions sectors, there is a critical nexus between transportation planning and local and regional air quality. Effective coordination with and implementation of the following regional transportation plans could serve to reduce mobile source emissions within the Planning Area:

- Placer County Regional Transportation Plan 2036: This plan includes the *Integrated Land Use, Air Quality & Transportation* section and *Air Quality, Global Warming, Climate Change & Greenhouse Gas Element*. An effort is underway to update this plan for the 2040 horizon year. Placer County's Regional Transportation Plan is integrated with the Sacramento Area Council of Government's (SACOG's) regional planning processes through the Metropolitan Transportation Plan/Sustainable Communities Strategy. Placer County Transportation Planning Agency works closely with SACOG and PCAPCD to assess the impact of all transportation projects on air quality in the region.

- Town of Loomis Trails Master Plan: This plan defines a vision for a trail system that includes opportunities for pedestrians, bicyclists and equestrians. This plan can serve as a guide in coordination with the General Plan Update to enhances both recreational and commuter transportation options, and reduce the reliance upon automobiles.

- Town of Loomis Bicycle Transportation Plan: This is a master plan document, that, like a general plan document, provides guidance for the Town as the ability to build new bike facilities become available. Integrated bicycle transportation planning can reduce congestion, increase circulation, and improve air quality.

- Placer County Regional Bikeway Plan: This plan is specific to the unincorporated portion of Placer County and does not propose new bikeway facilities within the Town of Loomis. However, planning of facilities and infrastructure within the Planning Area to integrate with this regional plan can provide new links to key destinations and communities through alternative transportation modes, thereby reducing regional VMT and mobile-source emissions, as well as increasing accessibility via active transportation modes to the Town of Loomis from surrounding communities.