

3.3.1 Introduction

This section identifies and evaluates issues related to air quality that could result from cannabis cultivation and manufacturing permitted under the Commercial Cannabis Cultivation and Manufacturing Regulations and Licensing Program (Program), including analysis of both the Project scenario and the More Permissive Project scenario. Existing air quality conditions in Santa Cruz County (County) are described, as well as applicable regulations. Potential impacts to air quality in the County that would result from the Program are evaluated, along with effectiveness of relevant Program components in addressing air quality. Where potentially significant impacts are identified, mitigation measures are recommended. This section is based on information from recent environmental documents prepared for the County, Monterey Bay Unified Air Pollution Control District (MBUAPCD), County Planning Department, County General Plan, the California Air Resources Board (CARB), and use of the California Emissions Estimator Model Version 2016.3.1 (CalEEMod).

Program Impact Analysis At a Glance

The Program could adversely affect air quality in the County based on odors, mobile trips, and energy use generated by the Program. Mitigation and Program setbacks would ensure odor impacts are less than significant. However, even with mitigation, NO_x levels due to mobile emissions from employee trips could have significant and unavoidable impacts. Unlicensed cannabis activities could also have significant and unavoidable secondary impacts.

3.3.2 Environmental Setting

This section discusses the existing air quality conditions within the County, including criteria pollutant levels and emissions. CARB has divided California into 15 regional air basins based on topographic features. Each basin is further divided into air pollution control districts (APCDs), which are responsible for managing and enforcing air quality regulations within their districts.

The County is in the North Central Coast Air Basin (NCCAB), which is comprised of Monterey, Santa Cruz, and San Benito Counties, covering an area of 5,159 square miles along the central coast of California. The northwest portion of the NCCAB is dominated by the Santa Cruz Mountains. MBUAPCD consists of all three counties within the NCCAB; therefore, the County is within the jurisdiction of the MBUAPCD.

North Central Coast Air Basin



The NCCAB and MBUAPCD are comprised of Santa Cruz, San Benito, and Monterey Counties. Source: CARB.

3.3.2.1 Topography and Meteorology

The County's air quality is influenced by both local topography and meteorological conditions. The semi-permanent high pressure cell in the eastern Pacific (Pacific High pressure cell) is the basic controlling factor in the climate of the NCCAB.

In the summer, the high-pressure cell is dominant and causes persistent west and northwest winds over the California coast. Air descends in the Pacific High pressure cell, forming a stable temperature inversion of hot air over a cool coastal layer of air. The onshore air currents pass over cool ocean waters to bring fog and relatively cool air into the coastal valleys. The warmer air above acts as a lid to trap air from moving upward. The generally northwest-southeast orientation of mountainous ridges tends to restrict and channel the summer onshore air currents.

In the fall, the surface winds become weak, and the marine layer grows shallow, dissolving completely on some days. The air flow is occasionally reversed in a weak offshore movement, and the relatively motionless air mass is held in place by the Pacific High pressure cell, which allows pollutants to build up over a period of a few days. It is most often during this season that the north or east winds develop to transport pollutants from either the San Francisco Bay area or the Central Valley into the NCCAB.

During the winter, the Pacific High pressure cell travels southward and has less influence on the NCCAB. Northwest winds are still dominant in winter, but easterly flow is more frequent than usual. The general absence of deep, persistent inversions and the occasional storm systems usually result in good air quality for the NCCAB in winter and early spring.

In the County, the Santa Cruz Mountains have a strong influence on atmospheric circulation, which results in generally good air quality. Small inland valleys, such as Scotts Valley, which have low mountains on two sides, have poorer circulation than the communities on the coastal plain. In addition, Scotts Valley is downwind of major pollutant generating centers in Silicon Valley, and these pollutants have time to form oxidants during their transit to Scotts Valley. Consequently, air pollutants tend to build up more at Scotts Valley than in the coastal regions, including the Santa Cruz and Watsonville areas of the County (County of Santa Cruz 2017a).

3.3.2.2 Sensitive Receptors

Individuals with pre-existing health problems, those who are close to an emissions source, or those who are exposed to air pollutants for long periods of time are considered more sensitive to air pollutants than others. Land uses such as primary and secondary schools, hospitals, and convalescent homes are relatively sensitive to poor air quality because the very young, the elderly, and the infirmed are more susceptible to respiratory infections and other air quality-related health problems than the public. Residential land uses are considered sensitive to poor air quality because people in residential areas are often at home for extended periods, and are subject to extended exposure to the type of air quality present at the residence. Recreational land uses offer individuals a location to exercise and are therefore considered moderately sensitive to air pollution. Vigorous exercise places a high demand on the human respiratory function and poor air quality could add potentially detrimental stresses to the respiratory function.

3.3.2.3 Common Air Pollutants

The following is a general description of the physical and health effects from the governmentally regulated air pollutants.

Ozone. Ozone (O_3) occurs in two layers of the atmosphere. The layer surrounding the Earth's surface is the troposphere. The troposphere extends approximately 10 miles above ground level, where it meets the second layer, the stratosphere. The stratospheric (the “good” ozone) layer extends upward from about 10 to 30 miles and protects life on Earth from the sun's harmful ultraviolet rays (UV-B). “Bad” ozone is a photochemical pollutant, and is formed from complex chemical reactions involving volatile organic compounds (VOCs), Nitrogen Oxides (NO_x), and sunlight; therefore, VOCs and NO_x are ozone precursors. Significant ozone formation generally requires an adequate number of precursors in the atmosphere and several hours in a stable atmosphere with strong sunlight. High ozone concentrations can form over large regions when emissions from motor vehicles and stationary sources are carried hundreds of miles from their origins.

Many respiratory ailments, as well as cardiovascular disease, are aggravated by exposure to high ozone levels. Ozone also damages natural ecosystems (such as forests and foothill plant communities) and damages agricultural crops and some human-made materials (such as rubber, paint, and plastics). Societal costs from ozone damage include increased healthcare costs, the loss of human and animal life, accelerated replacement of industrial equipment and reduced crop yields.

Carbon Monoxide. Carbon monoxide (CO) is an odorless, colorless toxic gas that is emitted by mobile and stationary sources as a result of incomplete combustion of hydrocarbons or other carbon-based fuels. In cities, automobile exhaust can cause as much as 95 percent of all CO emissions. At high concentrations, CO can reduce the oxygen-carrying capacity of the blood and cause headaches, dizziness, and unconsciousness.

Nitrogen Dioxide. Nitrogen oxides are a family of highly reactive gases that are a primary precursor to the formation of ground-level O_3 , and react in the atmosphere to form acid rain. Nitrogen Dioxide (NO_2) (often reported as total nitrogen oxides, NO_x) is a reddish-brown gas that can cause breathing difficulties at high levels. Peak readings of NO_2 occur in areas that have a high concentration of combustion sources (e.g., motor vehicle engines, power plants, refineries, and other industrial operations).

NO_2 can irritate and damage the lungs, and lower resistance to respiratory infections such as influenza. The health effects of short-term exposure are still unclear. However, continued or frequent exposure to NO_2 concentrations that are typically much higher than those normally found in the ambient air may increase acute respiratory illnesses in children and increase the incidence of chronic bronchitis and lung irritation. Chronic exposure to NO_2 may aggravate eyes and mucus membranes and cause pulmonary dysfunction.

Coarse Particulate Matter (PM_{10}). PM_{10} refers to suspended particulate matter, which is smaller than 10 microns or 10 one-millionths of a meter. PM_{10} arises from sources such as road dust, diesel soot, combustion products, construction operations, and dust storms. PM_{10} scatters light and significantly reduces visibility. In addition, these particulates penetrate the lungs and can potentially damage the respiratory tract. On June 19, 2003, CARB adopted amendments to the statewide 24-hour particulate matter standards based upon requirements set forth in the Children's Environmental Health Protection Act (Senate Bill [SB] 25).

Fine Particulate Matter (PM_{2.5}). Due to recent increased concerns over health impacts related to fine particulate matter (particulate matter 2.5 microns in diameter or less), both state and federal PM_{2.5} standards have been created. Particulate matter impacts primarily affect infants, children, the elderly, and those with pre-existing cardiopulmonary disease.

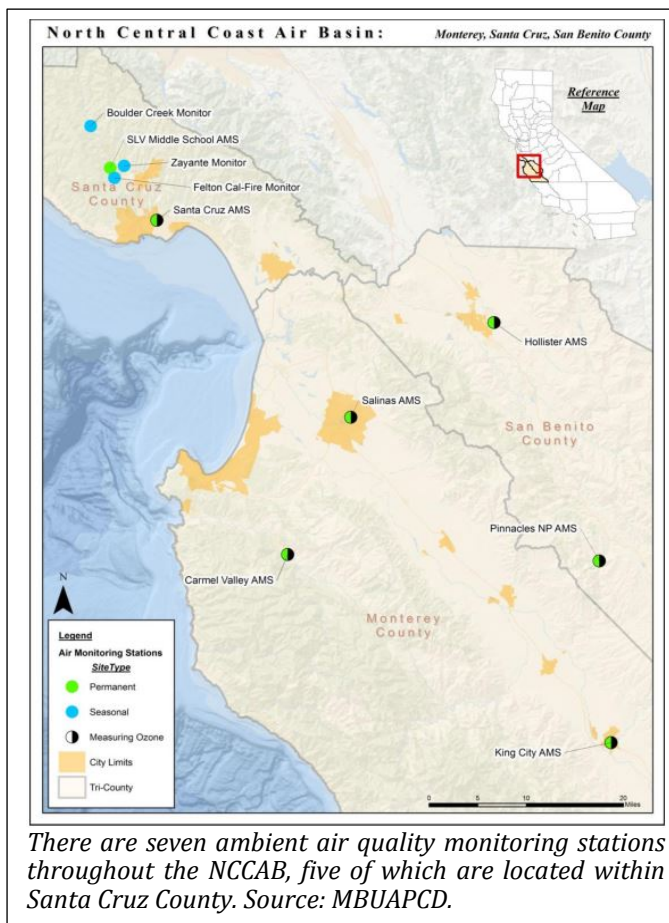
On June 20, 2002, CARB adopted amendments for statewide annual ambient particulate matter air quality standards. These standards were revised/established due to increasing concerns by CARB that previous standards were inadequate, as almost everyone in California is exposed to levels at or above the current state standards during some parts of the year, and the statewide potential for significant health impacts associated with particulate matter exposure was determined to be large and wide-ranging.

Reactive Organic Gases and Volatile Organic Compounds. Hydrocarbons are organic gases that are formed solely of hydrogen and carbon. There are several subsets of organic gases including reactive organic gases (ROGs) and VOCs. Both ROGs and VOCs are emitted from the incomplete combustion of hydrocarbons or other carbon-based fuels. The major sources of hydrocarbons are combustion engine exhaust, oil refineries, and oil-fueled power plants; other common sources are petroleum fuels, solvents, dry cleaning solutions, and paint (via evaporation).

3.3.2.4 Ambient Air Quality and Monitoring

Ozone, the primary constituent of smog and the main pollutant of concern for the NCCAB, is formed in the atmosphere through complex chemical interactions involving ROG¹ and NO_x in the presence of sunlight. The primary sources of ROG within the NCCAB are on- and off-road motor vehicles, petroleum production and marketing, solvent evaporation, and prescribed burning. The primary sources of NO_x are on- and off-road motor vehicles, stationary source fuel combustion, and industrial processes.

The MBUAPCD is responsible for measuring pollutant concentrations in the NCCAB. There are seven monitoring stations within the NCCAB. The air basin is situated downwind of the San Francisco Bay Area Air Basin (SFBAAB) and transport of ozone precursor emissions from the SFBAAB plays a dominant role in ozone concentrations measured in the County.



¹ ROG and VOC are considered equivalent in this analysis.

Ambient air quality standards (AAQS) establish levels of air quality that must be maintained to protect the public from the adverse effects of air pollution. California state standards are established to protect public health, including the most sensitive members of the population. National Ambient Air Quality Standards (NAAQS) include a primary standard to protect public health and a secondary standard to protect the public welfare including property, vegetation and visibility. AAQS are established for what are called “criteria air pollutants”, which include O₃, CO, NO_x, sulfur dioxide (SO₂), PM₁₀, and PM_{2.5}. The current AAQS for ozone are found below in Table 3.3-1 (MBUAPCD 2017).

Table 3.3-1 Ambient Air Quality Standards for Ozone

Pollutant	California Standards		National Standards*	
	Averaging Time	Concentration	Primary Concentration	Secondary Concentration
Ozone	1 hour	0.09 ppm	--	--
	8 hour	0.070 ppm	0.070 ppm	0.070 ppm

ppm=parts per million

*In 2015 National Standards were strengthened to 0.070 ppm from 0.075 ppm

Source: MBUAPCD 2017.

In 2012, the United States Environmental Protection Agency (U.S. EPA) issued final designations for the 2008 8-hour NAAQS (0.075 ppm) for ozone, which show the NCCAB as in attainment, based on monitoring data for 2009-2011. In 2015, the U.S. EPA lowered the National Standard to 0.070 ppm while also issuing a preliminary designation of attainment in the NCCAB based on 2013-2015 data. The U.S. EPA will make final designations for the new 2015 standard in October 2017, based on 2014-2016 data. Based on a review of preliminary data for the 2016 ozone season, it appears that the NCCAB will meet the 2015 standard of 0.070 ppm.

For the state ozone AAQS, CARB revised the standard in 2006 to include an 8-hour ozone average of 0.070 ppm, while retaining the existing 1-hour ozone standard at 0.09 ppm. Both these state standards must be met for the NCCAB to achieve the state standard overall. Currently, the NCCAB is designated by CARB as a nonattainment-transitional area for the state ozone standard. The reason this designation is different than the National Standard, is that the U.S. EPA and CARB use different attainment tests, with CARB’s method being more stringent. The current NCCAB attainment status is found below in Table 3.3-2 (MBUAPCD 2017).

Table 3.3-2 Attainment Status for the North Central Coast Air Basin

Pollutant	State Designation	Federal Designation
Ozone (O ₃)	Nonattainment-Transitional	Attainment
Inhalable Particulates (PM ₁₀)	Nonattainment	Attainment
Fine Particulates (PM _{2.5})	Attainment	Attainment
Carbon Monoxide (CO)	Santa Cruz County – Unclassified	Attainment
Nitrogen Dioxide (NO ₂)	Attainment	Attainment
Sulfur Dioxide (SO ₂)	Attainment	Attainment
Lead	Attainment	Attainment

Source: MBUAPCD 2017.

Ambient air quality is monitored at seven stations within the NCCAB. This network includes six stations operated by the MBUAPCD, and one station operated by the National Park Service (NPS) at

Pinnacles National Park. The data from the Pinnacles National Park station are also used by both CARB and the U.S. EPA to designate the NCCAB as attainment or nonattainment of the ozone standards (MBUAPCD 2017).

Cannabis Odors

Cannabis cultivation, and to a lesser degree manufacturing, is often accompanied by strong odors. Odors vary by variety, including pepper, balsamic vinegar, pine, citrus, and skunk-like odors. Most of the pungent aromas of cannabis come from a class of chemicals called terpenes. Terpenes are among the most common compounds produced by flowering plants, vary widely between plants, and are responsible for the fragrance of nearly all flowers. Cannabis produces over 140 different terpenes. These terpenes are found in varying concentrations in different cannabis varieties. THC, the cannabinoid primarily responsible for cannabis' psychoactivity, has no odor. Type and potency of cannabis odors range widely from variety to variety, as do the opinions by receptors regarding whether the odor is pleasant or objectionable.



Cannabis odors can be controlled in indoor settings through containments, ventilation, and filters to ensure sensitive receptors do not smell the odors offsite.

Cannabis odors can spread through the air and be sensed by surrounding receptors. For example, based on scoping comments received for this EIR, residents of Bonny Doon can often smell outdoor cannabis as an ambient air characteristic. Similarly, in the Deer Creek area of the Mountainous Region, cannabis odors were experienced on public roads during site visits conducted in January and February 2017 by the EIR consulting team (Amec Foster Wheeler 2017). However, the predictability and degree to which cannabis odors can travel is highly variable depending on climatic and topographic conditions near a cultivation site. Outdoor cultivation has the greatest potential to expose sensitive receptors to odors, though greenhouse and indoor cultivation may occasionally contribute odors to surrounding areas if ventilation systems are not effective or if indoor spaces are periodically aired out. Cannabis odors can be successfully contained within structures or filtered to prevent diffusion into surrounding areas.

3.3.3 Regulatory Setting

Air quality problems in the County are addressed through the effort of federal, state, local, and regional government agencies. These agencies work together and individually to improve air quality through legislation, regulations, policy making, education, and numerous related programs. The individual roles these agencies play in regulating air quality is described below and in Appendix A.

3.3.3.1 Federal

Clean Air Act Amendments

In 1990, the U.S. Congress adopted the federal Clean Air Act Amendments (CAAA), which updated the nation's air pollution control program. The CAAA established several requirements, including new deadlines for achieving federal clean air standards.

The U.S. EPA is the federal agency charged with administering the CAAA and other air quality-related legislation. As a regulatory agency, U.S. EPA's principal functions include setting NAAQS; establishing minimum national emission limits for major sources of pollution; and promulgating regulations.

The CAAA require the U.S. EPA to approve state implementation plans (SIPs) to meet and/or maintain the national AAQS. California's SIP is comprised of plans developed at the regional or local level. The approved SIP for the NCCAB consists of the 1994 Maintenance Plan and Contingency Control Measures for the Monterey Bay Region and adopted rules and regulations (MBUAPCD 2008).

3.3.3.2 Federal and State: Ambient Air Quality Standards

Both the state and the federal governments have established AAQS for several different pollutants, a summary of which is provided in Table 3.3-3. For some pollutants, separate standards have been set for different time periods. Most standards have been set to protect public health. However, for other pollutants, standards have been based on some other value (such as protection of crops, protection of materials, or avoidance of nuisance conditions).

3.3.3.3 State

California Clean Air Act

In 1988, the State legislature adopted the California Clean Air Act (CCAA), which established a statewide air pollution control program. CCAA requirements include annual emission reductions, increased development and use of low emission vehicles, and submittal of air quality attainment plans by air districts.

California Air Resources Board

CARB, a division of the California EPA (CalEPA) is the state agency responsible for coordinating both state and federal air pollution control programs in California, ensuring implementation of the CCAA and responding to the federal CAAA. CARB approves local air quality management plans (AQMPs) which address attainment and maintenance of state AAQS as mandated by the CCAA. CARB also coordinates and approves local plans which eventually become part of the SIP for submittal to CalEPA. CARB is responsible for the control of vehicle emission sources, while the local air district is responsible for enforcing standards and regulating stationary sources (MBUAPCD 2008).

Table 3.3-3 National and California Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards ¹	National Standards ²
		Concentration ³	Primary ^{3,4}
Ozone (O ₃)	1 Hour	0.09 ppm (180 µg/m ³)	--
	8 Hour	0.070 ppm (137 µg/m ³)	0.070 ppm (137 µg/m ³)
Respirable Particulate Matter (PM ₁₀) ⁵	24 Hour	50 µg/m ³	150 µg/m ³
	Annual Arithmetic Mean	20 µg/m ³	--
Fine Particulate Matter (PM _{2.5})	24 Hour	--	35 µg/m ³
	Annual Arithmetic Mean	12 µg/m ³	12.0 µg/m ³
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m ³)	35 ppm (40 mg/m ³)
	8 Hour	9.0 ppm (10 mg/m ³)	9 ppm (10 mg/m ³)
Nitrogen Dioxide (NO ₂) ⁶	1 Hour	0.18 ppm (339 µg/m ³)	100 ppb (188 µg/m ³)
	Annual Arithmetic Mean	0.030 ppm (57 µg/m ³)	0.053 ppm (100 µg/m ³)
Lead (Pb) ^{7,8}	30-day average	1.5 µg/m ³	--
	Calendar Quarter	--	1.5 µg/m ³ (for certain areas)
Sulfur Dioxide (SO ₂) ⁹	1 Hour	0.25 ppm (655 µg/m ³)	75 ppb (196 µg/m ³)
	3 Hour	--	--
	24 Hour	0.04 ppm (105 µg/m ³)	0.14 ppm (for certain areas)
Visibility-Reducing Particles ¹⁰	8 Hour	Extinction coefficient = 0.23 km@<70% RH	No National Standards
Sulfates	24 Hour	25 µg/m ³	
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m ³)	
Vinyl Chloride ¹¹	24 Hour	0.01 ppm (26 µg/m ³)	

Source: CARB 2016.

¹ California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM₁₀, 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.

² 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 three years, is equal to or less than the standard. For PM₁₀, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m³ is equal to or less than one. For PM_{2.5}, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current national policies.

³ Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

⁴ National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

Table 3.3-3 National and California Ambient Air Quality Standards (Continued)

⁵ On December 14, 2012, the national annual PM_{2.5} primary standard was lowered from 15 µg/m³ to 12.0 µg/m³. The existing national 24-hour PM_{2.5} standards (primary and secondary) were retained at 35 µg/m³, as was the annual secondary standard of 15 µg/m³. The existing 24-hour PM₁₀ standards (primary and secondary) of 150 µg/m³ also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

⁶ 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. Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

⁷ CARB 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.

⁸ The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 µg/m³ 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 standard are approved.

⁹ On June 2, 2010, a new 1-hour SO₂ 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 SO₂ national standards (24-hour and annual) remain in effect until one 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.

Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). 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 to 0.075 ppm.

¹⁰ In 1989, the CARB 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 "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

¹¹ The CARB 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.

Abbreviations:

µg/m³ = micrograms per cubic meter; ppm = parts per million; ppb = parts per billion; km = kilometer(s); RH = relative humidity.

3.3.3.4 Regional

Monterey Bay Unified Air Pollution Control District

MBUAPCD shares responsibility with CARB for ensuring that state and national AAQS are achieved and maintained within the NCCAB. State law assigns local air districts the primary responsibility for control of air pollution from stationary sources while reserving to CARB an oversight function. MBUAPCD is responsible for developing regulations governing emissions of air pollution, permitting and inspecting stationary sources of air pollution, monitoring of ambient air quality, and air quality planning activities, including implementation of transportation control measures (MBUAPCD 2008).

MBUAPCD monitors air quality and regulates stationary emission sources in the County. As a responsible agency under the California Environmental Quality Act (CEQA), MBUAPCD reviews and approves environmental documents prepared by other lead agencies or jurisdictions to reduce or avoid impacts on air quality and to ensure that the lead agency's environmental document is adequate

to fulfill CEQA requirements. As a concerned agency, the MBUAPCD comments on environmental documents and suggests mitigation measures to reduce air quality impacts.

MBUAPCD Air Quality Management Plan (2012-2015)

The CCAA requires attainment of state AAQS by the earliest practicable date. For air districts in violation of the state ozone, carbon monoxide, sulfur dioxide, or nitrogen dioxide standards, attainment plans were required by July 1991. The MBUAPCD was required to develop an attainment plan to address ozone violations. The CCAA requires the MBUAPCD to periodically prepare and submit a report to CARB that assesses its progress toward attainment of the state AAQS. This report is the seventh update to the 1991 AQMP, and updates elements included in the 2012 AQMP based on a review of the period from 2012-2015. It shows that the region continues to make progress toward meeting the state ozone standard.

This AQMP only addresses attainment of the state ozone standard. It is an assessment and update to the 2012 Triennial Plan. In 2012, the U.S. EPA designated the NCCAB as in attainment with the national 8-hour ozone standard of 0.075 ppm. In 2015, the national standard was revised to 0.070 ppm. The NCCAB continues to be in attainment with the stricter national standard (MBUAPCD 2017).

Association of Monterey Bay Area Governments

The Association of Monterey Bay Area Governments (AMBAG) is the Metropolitan Planning Organization (MPO)/Regional Transportation Planning Agency (RTPA) for the Monterey Bay Area, which is responsible for coordinating with all the RTPAs, such as San Benito County Council of Governments, the Santa Cruz County Regional Transportation Commission, and the Transportation Agency of Monterey County. The MBUAPCD will work closely with AMBAG and its constituents to include appropriate air quality components in the Sustainable Communities Strategy Implementation Project (SCSIP), the 2040 Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS), and other local and regional projects to ensure the most comprehensive regional best management practices possible.

Population forecasts adopted by AMBAG are used to forecast population-related emissions. Through the planning process, emission growth is offset by basin-wide controls on stationary, area, and transportation sources of air pollution.

3.3.3.5 Local

County of Santa Cruz General Plan and Local Coastal Program (LCP)

Conservation and Open Space Element

Objective 5.18 – Air Resources. To improve the air quality of Santa Cruz County by meeting or exceeding state and federal ambient air quality standards, protect County residents from the health hazards of air pollution, protect agriculture from air pollution induced crop losses and prevent degradation of the scenic character of the area.

Air Resources Policy 5.18.1 – New Development. Ensure new development projects are consistent at a minimum with the Monterey Bay Unified Air Pollution Control District Air Quality Management Plan and review such projects for potential impact on air quality.

Air Resources Policy 5.18.2 – Non-Attainment Pollutants. Prohibit any net increase in emissions of non-attainment pollutants or their precursors from new or modified stationary sources which emit 25 tons per year or more of such pollutants.

Air Resources Policy 5.18.3 – Air Quality Mitigations. Require land use projects generating high levels of air pollutants (i.e., manufacturing facilities, hazardous waste handling operations) to incorporate air quality mitigations in their design.

Air Resources Policy 5.18.5 – Sensitive Land Uses. Locate air pollution sensitive land uses, including hospitals, schools, and care facilities, away from major sources of air pollution such as manufacturing, extracting facilities.

Air Resources Policy 5.18.6 – Plan for Transit Use. Encourage commercial development and higher density residential development to be located in designated centers or other areas that can be easily served by transit.

Air Resources Policy 5.18.7 – Alternatives to the Automobile. Emphasize transit, bicycles, and pedestrian modes of transportation rather than automobiles.

Air Resources Policy 5.18.8 – Encouraging Landscaping. Maintain vegetated and forested areas, and encourage cultivation of street trees and yard trees for their contributions to improved air quality.

Santa Cruz County Code (SCCC)

Chapter 7.110 – Ozone-Depleting Compounds

The purpose of this chapter is to protect the environment, and the health, safety and welfare of the County's citizens by prohibiting the manufacture, sale and distribution of certain products made of or with CFCs involved in the manufacturing process, and by significantly reducing the release of halons into the earth's atmosphere.

3.3.4 Methodology and Assumptions

This analysis of potential air quality impacts reviews the existing air quality described in Section 3.3.2, *Environmental Setting*, and determines the Program's potential impact on air quality, including the Project and the More Permissive Project scenarios. For analysis of GHGs, please see Section 3.7, *Greenhouse Gas Emissions and Climate Change*. Refer to Section 3.0, *Introduction and Approach to Analysis*, for a detailed discussion of projected cannabis activities in the County due to Program implementation.

To address direct impacts from operational emissions, CalEEMod was run in August 2017 to provide a conservative estimate of operational air emissions potentially produced from the projected increase in cannabis cultivation above existing activities. Emissions from cultivation are generated from electricity demand from indoor and greenhouse cultivators, water demand from all cultivation types, and vehicle trips/miles traveled from cannabis industry employment. Since cannabis cultivation is a unique land use type that does not have predetermined factors for CalEEMod, user-defined land uses for indoor, greenhouse, and outdoor cultivation were run through the model, with the following assumptions for cultivation demands:

Table 3.3-4 CalEEMod Assumptions by Cultivation Type

Emission Source	Indoor	Greenhouse	Outdoor
Water Demand	0.1 gallons of water per day per sf with a growing season of 365 days	0.1 gallons of water per day per sf with a growing season of 270 days	0.03 gallons of water per day per sf with a growing season of 180 days
Electricity	200,000 kWh/year of electricity per 1,000 sf of canopy	110,000 kWh/year of electricity per 1,000 sf of canopy	N/A
Vehicle Daily Trips (employees only)	An average daily traffic trip rate of 1.64/1,000 sf of canopy with employees commuting 6 days a week		

Sources: ODOE 2017; County of Santa Cruz 2017; RAND 2010.

Detailed CalEEMod assumptions and results can be found in Appendix F.

Electricity demand estimates used the Oregon Department of Energy's (ODOE) Indoor Cannabis Cultivator Energy Use Estimator. As a conservative estimate of energy demand for indoor cultivators, high energy usage was assumed, which includes high wattage high intensity discharge (HID) fixtures, unvented, high light density (less than 40 sf per light), significant supplemental cooling and/or heating to grow space, high volume ventilation and air circulation (high level of air changes) that operates majority of the time, as well as multiple other energy using equipment, including dehumidification, pumping and water temperature control, and CO₂ production. The calculations assume a typical 12 to 18 hour per day light operation for vegetative and flowering phases and a continuous grow cycle. The model estimates the energy demand for indoor cultivators would be 200,000 kilowatt hours (kWh) per year per 1,000 sf of canopy. For estimated energy demand from greenhouse cultivators, it was assumed that approximately one half of these operations would be medium-high energy users and one half would be medium-low energy users reflecting the assumption these operations would include a mixture of cultivation types. Medium high energy use includes high wattage HID fixtures with medium light density (40-60 sf per light), significant supplemental cooling and/or heating to grow space, high volume ventilation and air circulation that is frequently on, and minimal dehumidification, pumping, CO₂ production, or addition energy usages. Medium-low energy usage includes high wattage HID fixtures at low light fixture density (greater than 60 sf per light), very minimal or no supplemental cooling or heating to grow space, minimal mechanical ventilation and air circulation (ventilation only used minimally and not continuously to control temperature), and no dehumidification, pumping, CO₂ production, or additional energy usages. The model estimates medium-high energy demand would be 140,000 kWh/year/1,000 sf, and medium low energy demand would be 80,000 kWh/year/1,000 sf. The average of these two numbers is 110,000 kWh/year/1,000 sf (ODOE 2017). See Section 3.14, *Utilities and Energy Conservation*, for more discussion on electricity rates.

Average cannabis water demand factors were determined based on literature review and observed conditions by the County Licensing Office staff (County of Santa Cruz 2017b). These factors assume that all operations would utilize new water (i.e., no water would be recycled and reused onsite) to project a reasonable worst case water demand from new cannabis cultivation. Total water demands were estimated based on estimated new cultivation/canopy area for outdoor, indoor, and greenhouse operations, average water demand factors calculated for cannabis cultivation, and standard number of growing days based on type of operation. See Section 3.14, *Utilities and Energy Conservation*, for more discussion on water use rates.

Mobile emissions were estimated based on an average daily trip rate for cannabis cultivation derived from research conducted by the RAND Drug Policy Center and the ERA Economics study (RAND 2010) (ERA Economics, LLC for CA Department of Food and Agriculture 2017). See Section 3.13, *Transportation and Circulation* for analysis of average daily trip rates and transportation impacts.

This analysis programmatically addresses emissions from manufacturing operations and construction of cannabis-related structures, including any residential units, where the use of CalEEMod was unreliable or infeasible due to the speculative nature of these activities. Utility and energy demands resulting from new cannabis home occupations and small-scale cannabis product manufacturing are not assessed, as demands are largely represented as part of the existing Countywide conditions and would represent a negligible increase over existing demands. The construction of up to 228 new homes associated with cultivation sites would have to comply with established building codes including strict state-wide energy efficiency standards. It is assumed that manufacturing facilities would occur in existing buildings and any new commercial buildings, or improvements to existing buildings and greenhouses, would also have to comply with energy efficiency and renewable energy standards in the building code. Therefore, energy demand associated with manufacturing operations and construction of cannabis-related structures is minimal.

Impacts to air quality are assessed through the evaluation of existing air quality in the County, review of existing policy framework for the protection of air quality, review of the Program's requirements, and comparison of the Program's potential emissions with MBUAPCD thresholds of significance. The Program is reviewed for the potential to result in a significant change from the existing air quality setting, including potential exposure to cannabis-related odors, as well as potential inconsistencies of the Program with the MBUAPCD AQMP. The analysis takes into consideration the existing General Plan policies that identify and protect air resources including the County's goal of meeting or exceeding state and federal ambient air quality standards, and protecting residents from the health hazards of air pollution. The analysis also accounts for provisions of the Program, including the proposed requirement that: "All licenses issued under [the Program] must be consistent with the County's policies, objectives, laws, regulations, and programs related to land use, including those related to the County's General Plan and Local Coastal Program."

3.3.5 Significance Criteria

CEQA Guidelines Thresholds

The following thresholds of significance are based on Appendix G of the 2017 CEQA Guidelines. Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Implementation of the Program would have a significant impact on air quality if the Program would result in any of the following:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);

- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

MBUAPCD Air Quality Thresholds

The MBUAPCD is the applicable air pollution control district for the Program. Therefore, its significance criteria are used in this analysis to determine the Program's impact on air quality based on the MBUAPCD CEQA Air Quality Guidelines.

Emissions from construction activities represent temporary impacts that are typically short in duration, depending on the size, phasing, and type of project. Air quality impacts can nevertheless be acute during construction periods, resulting in significant localized impacts to air quality. Table 3.3-5 summarizes the threshold of significance for construction activities in the County.

Table 3.3-5 Threshold of Significance for PM₁₀ – Construction Impacts

Source	Threshold of Significance
Direct emissions	82 lbs/day*

*District-approved dispersion modeling can be used to refute (or validate) this determination of significance if direct emissions would not cause an exceedance of State PM₁₀ AAQS. The MBUACPD guidelines also recognize the difficulty of accurately estimating fugitive emissions from earth moving and apply general areas guidelines as a screening value, where up to 8.2 acres may be graded with minimal earthmoving or 2.2 acres may be graded and excavated without exceeding the PM₁₀ significance threshold of 82 lbs/day.

Source: MBUAPCD 2008.

Emissions from long-term operations generally represent a project's most substantial air quality impact. Table 3.3-6 summarizes the thresholds of significance for operational impacts by pollutant. An exceedance of any threshold would represent a significant impact on local or regional air quality. The following thresholds apply to all indirect and direct emissions within the air basin, whether they are subject to MBUAPCD authority, unless noted otherwise.²

² Indirect emissions come from mobile sources that access the project site but generally emit offsite; direct emissions are emitted onsite (e.g., stationary sources, onsite mobile equipment).

Table 3.3-6 Thresholds of Significance for Criteria Pollutants of Concern – Operational Impacts*

Pollutant	Threshold(s) of Significance
VOC	137 lbs/day (direct + indirect)
NO_x, as NO₂	137 lbs/day (direct + indirect)
PM₁₀	82 lbs/day (onsite only)**
CO	LOS at intersection/road segment degrades from D or better to E or F or V/C ratio at intersection/road segment at LOS E or F increases by 0.05 or more or delay at intersection at LOS E or F increases by 10 seconds or more or reserve capacity at unsignalized intersection at LOS E or F decreases by 50 or more *** 550 lbs/day (direct only)***
SO_x, as SO₂	150 lbs/day (direct only)**

Notes: Indirect emissions come from mobile sources that access the project site but generally emit offsite; direct emissions are emitted onsite (e.g., stationary sources, onsite mobile equipment).

*Projects that emit other criteria pollutant emissions would have a significant impact if emissions would cause or substantially contribute to the violation of state or national AAQS. Criteria pollutant emissions could also have a significant impact if they would alter air movement, moisture, temperature, climate, or create objectionable odors in substantial concentrations. When estimating project emissions, local or project-specific conditions should be considered.

**The District's 82 lbs/day operational phase threshold of significance applies only to onsite emissions and project-related exceedances along unpaved roads. These impacts are generally less than significant. On large development projects, almost all travel is on paved roads (0% unpaved), and entrained road dust from vehicular travel can exceed the significant threshold. Please contact the Air District to discuss estimating emissions from vehicular travel on paved roads. District-approved dispersion modeling can be used to refute (or validate) a determination of significance if modeling shows that emission would not cause or substantially contribute to an exceedance of state and national AAQS.

***Modeling should be undertaken to determine if the project would cause or substantially contribute *(550 lbs/day) to exceedance of CO AAQS. If not, the project would not have a significant impact.

Source: MBUAPCD 2008.

3.3.6 Environmental Impact Analysis and Mitigation

This section discusses the potential air quality impacts associated with the Program. A detailed discussion of each impact follows. The introduction of excessive criteria pollutants and odors by the Program that conflict with the County's existing air quality standards and plan, may be considered significant air quality effects. Where there are potentially significant or significant and unavoidable impacts, mitigation measures are proposed and the residual impact is determined. Impacts and mitigation measures are summarized in Table 3.3-8.

3.3.6.1 Program Impacts

Impact AQ-1. Commercial cannabis cultivation and manufacturing under the Program could potentially expose sensitive receptors to substantial pollutant concentrations and create objectionable odors affecting a substantial number of people. Impacts would be less than significant with mitigation.

Impact AQ-1.1 – Direct Cultivation/Manufacturing. Direct impacts include the air pollutants and objectionable and detectable odors emitted from the direct cultivation and manufacturing of cannabis

under the Program. Sensitive receptors that are located near cannabis cultivation or manufacturing sites are most susceptible to harmful air pollutants and/or obnoxious odors produced by sources such as fuels, fertilizers, burning waste, manufacturing processes, and cannabis plants. Although the scent of cannabis plants is not necessarily harmful to people, the plants can produce a skunky smell, especially during the flowering phase, which is often why some people find the scent objectionable.

As described in Section 2.3.2, *Program Components*, cannabis cultivation would be limited within the Urban and Rural Services Lines (USL + RSL), which would limit cultivation within urban areas where air quality and odor conflicts may be more common, such as with sensitive receptors like schools and neighborhoods. The Program also requires cannabis cultivation sites to be setback from sensitive receptors, such as habitable structures, parks, and schools. The More Permissive Project generally reduces these required setbacks from the Project's setbacks, which would increase the risk of air quality and odor impacts on adjacent sensitive receptors such as rural residences. Under both scenarios, no cannabis cultivation would be allowed within a residence or residential garage, which would restrict odors within neighborhoods. The use of generators as an energy source for cultivation would not be allowed under the Program, which would prevent odors and harmful emissions emanating from diesel and gasoline fuels.



Outdoor cannabis cultivation can generate strong odors that may adversely affect sensitive receptors. However, with siting and distance/setback requirements of the Program, these effects would be minimized.

The proposed SCCC Chapter 7.128 for cultivation requires indoor cannabis cultivation to use a commercial air scrubbing or filtration system sufficient to prevent the odors associated with cannabis production from escaping the structure where cannabis is cultivated. This requirement would prevent any adverse odor effects on sensitive receptors Countywide. However, a similar requirement is not proposed or available for outdoor or greenhouse cannabis cultivation sites to prevent odors, which could travel on the wind and affect nearby neighborhoods or other sensitive receptors. Greenhouses typically contain agricultural odors, but can have an adverse effect when the greenhouse is opened up, allowing trapped odors to emanate all at once. Also, odors emanating from exhaust fans or facilities that are not effectively removing odors could adversely affect people. In addition, SCCC Chapter 7.128 as drafted does not prohibit the burning of agricultural cannabis waste or vegetative matter from clearing of a site following harvest. Outdoor and greenhouse cannabis cultivation would often occur on rural agricultural or timber production parcels, where odors from agricultural operations are a typical and anticipated occurrence. However, it is likely that even in rural areas, rural communities such as Bonny Doon and Ben Lomond could experience increased exposure to odors from licensed outdoor and greenhouse cultivators. The acreage projected for outdoor cultivation under the Program (22.8 acres) could create objectionable odors affecting a substantial number of people. Therefore, direct impacts due to objectionable odors emitted from cannabis cultivation facilities for both the Project and More Permissive Project would be potentially significant.

The use of agricultural pesticides in cannabis cultivation also contributes evaporative air emissions in the form of toxic air contaminants (TACs) and VOCs that could affect sensitive receptors near outdoor and greenhouse-based cultivation sites. Based on Program registration data, of the 567 existing cultivators, 86 currently use pesticides on their cannabis grows. Of the 193 proposed

cultivators, 13 stated that they plan to use pesticides, but this value is not reliable as it was user reported and may change through the licensing process. Many of these cultivators use either organic pesticides such as MET-52, a natural fungus that gets rid of spider mites, or common pesticides found at garden supply hardware stores applied with a hand sprayer, which would have no effect on sensitive receptors. However, for larger-scale outdoor cultivation, sprinklers, dust, or powder fertilizers could be applied, which have a larger potential to affect sensitive receptors.

The California Department of Pesticide Regulation (DPR) proposed DPR 16-004 to regulate pesticide use near school sites. DPR 16-004 would require growers to notify public K-12 schools, child day care facilities, and county agricultural commissioners when certain pesticide applications made to produce an agricultural commodity near a school site are planned in the coming year and a few days prior to the applications. In addition, certain pesticide applications near these school sites would be prohibited at certain times. The proposed regulatory action would apply pesticide application restrictions Monday through Friday, during the hours of 6:00 a.m. to 6:00 p.m., depending on the distance from the treated area to a school site, the application equipment used, and type of pesticide applied. During these time periods, there must be a minimum 0.25-mile distance restriction from school sites for pesticide applications using aircraft, airblast sprayers, sprinklers, dust, powder, or fumigants. Because of the minimal number of cultivators that use pesticides, the fact that no cultivators report using industrial scale pesticides, and the setbacks already built into the Program to protect sensitive uses from airborne pollutants, pesticide use under the Program would be incremental. However, the setback of 0.25 mile for certain pesticides proposed by the state is larger than the Program setback of 600 feet from schools, which could create a potential conflict. Therefore, impacts to sensitive receptors from pesticide use on cannabis cultivation sites would be potentially significant.

The proposed SCCC Chapter 7.132 for manufacturing requires that an indoor cannabis manufacturing facility use a commercial air scrubbing or filtration system sufficient to prevent odors from escaping the facility. To fully mitigate odors, all manufacturing facilities are required to use a mechanical source capture system. Further, all cannabis manufacturing operations which generate emissions from extraction processes are required to obtain applicable permits from the MBUAPCD, such as Authority to Construct and Permit to Operate permits. Therefore, development standards included within the Program would ensure that objectionable odors emitted from indoor manufacturing facilities would be reduced to a less than significant level for both the Project and More Permissive Project.

The Program would also allow for outdoor manufacturing facilities in the form of an “open air extraction area”, but only within CA, A, and AP zone districts on parcels at least 20 acres in size, and with no residences located in proximity to the operation. Since open air manufacturing would only be restricted from residence receptors, there is a possibility that other sensitive receptors such as schools, convalescent homes, or recreational areas would be affected by these outdoor manufacturing areas. Given the potential for outdoor manufacturing operations to create air pollution and objectionable odor effects on nearby sensitive receptors, the impact of open air manufacturing operations on sensitive receptors would be potentially significant for both the Project and the More Permissive Project.

Mitigation Measures

MM AQ-1.1. Siting for Odor Abatement. To reduce objectionable odor impacts associated with outdoor cultivation sites under the Program, proposed SCCC Chapter 7.128 shall be revised prior to adoption to state that potential Licensees for outdoor cannabis cultivation operations shall

consider siting the future outdoor grow with consideration of prevailing wind direction and topography to ensure that any odors emanating from the cannabis plants do not reach nearby sensitive receptors, residential neighborhoods, or a substantial number of people, to the maximum extent feasible.

Plan Requirements and Timing. SCCC Chapter 7.128 shall be revised prior to adoption of the Program.

Monitoring. The Board of Supervisors shall review and adopt a final SCCC Chapter 7.128 that includes this requirement. The Licensing Official shall determine that a site adheres to MM AQ-1.1 before issuance of a license.

MM AQ-1.2. Greenhouse Odors. To reduce objectionable odor impacts associated with airing out greenhouses used for cannabis cultivation under the Program, proposed SCCC Chapter 7.128 shall be revised prior to adoption to require greenhouses that cultivate cannabis to install and utilize a commercial air scrubbing or filtration system sufficient to prevent the odors associated with cannabis production from escaping the structure if an adverse effect has previously been documented as affecting a substantial number of people. The system need only be used prior to opening up the greenhouse to deplete any trapped odors and lessen the odors that would otherwise emanate all at once.

Plan Requirements and Timing. SCCC Chapter 7.128 shall be revised prior to final adoption of the Program by the Board of Supervisors to include the requirement.

Monitoring. The County Planning Department shall review and approve amendments to SCCC Chapter 7.128. The Licensing Official shall determine that a site adheres to MM AQ-1.2 before issuance of a license.

MM AQ-1.3. Prohibit Cannabis Material Burning. To reduce PM₁₀ emissions and objectionable odors related to burning of cleared vegetation and/or agricultural waste, proposed SCCC Chapters 7.128 and 7.132 shall be revised prior to adoption to include the provision that the burning of cleared cannabis vegetation and/or excess cannabis plant materials associated with the cultivation and/or manufacturing of cannabis is prohibited.

Plan Requirements and Timing. SCCC Chapters 7.128 and 7.132 shall be revised prior to adoption of the Program to include this requirement.

Monitoring. The Licensing Official shall determine that a site adheres to MM AQ-1.3 before issuance of a license.

MM AQ-1.4. Consistency of Pesticide Use Setbacks. To ensure consistency with the foreseeable state regulation DPR 16-004, Pesticide Use Near School Sites, proposed SCCC Chapter 7.128 shall be revised prior to adoption to clarify that the County shall not issue a cultivation license to any site that would apply pesticides using aircraft, airblast sprayers, sprinklers, dust, powder, or fumigants located within 0.25 mile from a school.

Plan Requirements and Timing. SCCC Chapter 7.128 shall be revised prior to adoption of the Program by the Board of Supervisors.

Monitoring. The Licensing Official shall determine that a site adheres to MM AQ-1.4 before issuance of a license.

MM AQ-1.5. Open Air Extraction Area Setbacks. To reduce air pollutant and objectionable odor impacts associated with open air extraction areas under the Program, proposed SCCC Chapter 7.132 shall be revised prior to adoption to clarify that setbacks from open air extraction areas shall be maintained from schools, libraries, alcohol and drug treatment facilities, parks, and other sensitive receptors in addition to residence receptors to mitigate impacts from objectionable odors. The Cannabis Licensing Official shall have discretion to determine an acceptable distance between an open air extraction area and a sensitive receptor on a case-by-case basis.

Plan Requirements and Timing. SCCC Chapter 7.132 shall be revised prior to adoption of the Program.

Monitoring. The Licensing Official shall determine that a site adheres to MM AQ-1.5 before issuance of a license.

Post-Mitigation Level of Impacts

With the implementation of MM AQ-1.1 through MM AQ-1.5, residual direct air pollution and objectionable odor impacts from cannabis cultivation and manufacturing operations would be *less than significant with mitigation* for both the Project and the More Permissive Project. The County would ensure that changes in the proposed SCCC Chapters 7.128 and 7.132, and the Licensing Program are carried through and implemented on a site-by-site basis.

Impact AQ-1.2 -Indirect Cultivation/Manufacturing. Indirect impacts of the Program would result from air pollutants and odors produced due to the construction of up to 228 new onsite residential units required to cultivate, along with any associated roads, utility infrastructure, and site improvements to support onsite cannabis cultivation operations. Residences would be required for eligible parcels within A, RA, TP, and SU zone districts, but not within the CA zone district such as for the projected use of 147 acres of greenhouses. Additionally, County Fire Code requirements would require onsite water tanks, roadways, and vegetation clearing as described in Section 3.0, *Introduction and Approach to Analysis*.

Air pollutants and odors associated with construction could potentially adversely affect sensitive receptors and/or a substantial number of people, but construction of houses and infrastructure would be short-term and distributed Countywide, and would represent a limited source for odors or other emissions. Therefore, indirect impacts related to air pollution and objectionable odors would be considered *less than significant* for both the Project and the More Permissive Project.

Impact AQ-2. Commercial cannabis cultivation and manufacturing under the Program could be potentially inconsistent with the MBUAPCD AQMP. Impacts would be significant and unavoidable.

Impact AQ-2.1 – Direct Cultivation/Manufacturing. Direct impacts from the Program are related to the commercial cultivation and/or manufacturing of cannabis in the County. To determine whether the Program's operations would be consistent with the applicable air quality plan, the Program's operational air quality emissions estimated using CalEEMod (see Appendix F) were compared to the MBUAPCD AQMP for consistency. The CalEEMod results calculate the potential emissions of future cultivators, that is, those not cultivating as of 2016, based on the type of cultivation and canopy size recorded in the County's cannabis licensing registration data from 2016. As described further in Section 3.0, *Introduction and Approach to Analysis*, it is likely that the location and total number of licensed sites will vary from the registration data depending on the adopted Program regulations and

the degree to which registrants can find a suitable location for the proposed cannabis activity. Nevertheless, this analysis assumes that all registrants would be able to obtain a license within the County in order to provide a conservative analysis of a reasonable worst case scenario per State CEQA Guidelines.

Consistency with local and regional air quality plans, such as the MBUAPCD AQMP, is required under CEQA. Consistency with the AQMP means that stationary and vehicle emissions associated with the proposed Program are accounted for in the AQMP's emissions growth assumptions. The County is currently under nonattainment status for ozone, and the Project would result in emissions of ozone precursors (NO_x and ROG). The AQMP stresses that reducing NO_x emissions from mobile sources is crucial for reducing ozone formation in the NCCAB. Mobile sources account for 60 percent of the AQMP's 2015 NO_x inventory. The AQMP emission reduction strategy report shows that the NCCAB continues to make progress toward attaining the 8-hour ozone standard, but the MBUAPCD's priority is to continue to pursue reduction of ozone precursor emissions from mobile sources, especially for NO_x .

In total, the new cannabis cultivators under the Program could contribute approximately 251 lbs/day of NO_x . Since the Program would emit more than 137 lbs/day of NO_x (see Table 3.3-7 below), Program emissions from cultivation are not consistent with the AQMP and are not accommodated in the AQMP. Cannabis manufacturers may contribute additional NO_x associated with additional employee trips from approximately 20 new larger/higher-yield manufacturers per year, for the first five years of the Program. As explained in Section 3.13, *Transportation and Circulation*, the average daily trips calculated for cultivation activities under the Program are a conservative estimate and are assumed to adequately characterize the impacts from both cultivation and manufacturing activities under the Program. The collective increase in NO_x from both cultivation and manufacturing would continue to exceed the threshold for NO_x and would not be consistent with the AQMP.

Measures to reduce employee trips for the commercial cannabis industry may reduce the NO_x emissions from the Program, including transportation demand management (TDM) measures such as carpooling and shuttle service during harvesting periods. However, as these measures would vary site-by-site, it is unclear whether NO_x emissions could be reduced to levels that are consistent with the AQMP. Implementation of the Program would exceed adopted thresholds and would be inconsistent with the AQMP, so direct impacts related to Program consistency with the AQMP would be *potentially significant* for both the Project and the More Permissive Project.



Commercial cannabis cultivation and manufacturing could increase employee trips in the County, which would generate NO_x levels that exceed MBUAPCD thresholds. Ridesharing and other measures to reduce trips would help reduce this impact.

Mitigation Measures

MM AQ-2.1. Implement TDM Measures. To reduce operation-generated NO_x emissions related to offsite mobile emissions caused by implementation of the Program, proposed SCCC Chapters 7.128 and 7.132 shall be revised prior to adoption to include the provision that Licensees must implement feasible TDM measures that reduce vehicle travel to and from their proposed site:

- Provide for carpool/shuttle/mini bus service for employees, especially during harvesting periods, on cultivation sites.
- Provide bicycle storage/parking facilities.
- Provide incentives to employees to rideshare or take public transportation.
- Implement compressed or flexible work schedules to reduce the number of days per week that employees are needed onsite.

Plan Requirements and Timing. SCCC Chapters 7.128 and 7.132 shall be revised prior to final adoption of the Program by the Board of Supervisors.

Monitoring. The Licensing Official shall determine that a site adheres to MM AQ-2.1 before issuance of a license.

Post-Mitigation Level of Impacts

With implementation of MM AQ-2.1, mobile emissions generated by employee trips to and from cannabis cultivation and/or manufacturing sites would be reduced. Due to the inability to ensure that all sites are implementing these TDM measures regularly and the inability to quantify the mobile emissions reductions, direct residual impacts associated with Impact AQ-2.1 would be *significant and unavoidable*.

Impact AQ-2.2 – Indirect Cultivation/Manufacturing. Indirect impacts of the Program would be related to the construction of up to 228 new residential units required to receive a license for cultivation, along with any associated roads, utility infrastructure, and site improvements to support cultivation operations. Residences would be required for parcels within A, RA, TP, and SU zone districts. Additionally, County Fire Code requirements would require water tanks, roads, and vegetation management to create defensible space as described in Section 3.0, *Introduction and Approach to Analysis*.

Air quality emissions produced by the construction and operation of these new houses and associated infrastructure under the Program would be characteristic of a typical rural single family home's emissions, and would constitute an incremental increase in emissions in the County by itself; however, as emissions from indirect impacts are considered in addition to direct impact emissions, they would add onto the already significant levels of NO_x emissions, making the Program even more inconsistent with the AQMP (see Table 3.3-7 below). Therefore, indirect impacts related to Program consistency with the AQMP would be *potentially significant* for both the Project and the More Permissive Project.

Mitigation Measures

Implement MM AQ-2.1. Implement TDM Measures. To reduce indirect impacts related to Program consistency with the AQMP, MM AQ-2.1, addressing implementation of feasible TDM measures, shall apply to Impact AQ-2.2.

Post-Mitigation Level of Impacts

With implementation of MM AQ-2.1, indirect impacts due to additional emissions generated by the construction and operation of up to 228 homes, water tanks, and associated improvements may be reduced. However, due to the inability to ensure that all sites are implementing these TDM measures on a regular basis and the inability to quantify the mobile emissions reductions, direct residual impacts associated with Impact AQ-2.2 would remain *significant and unavoidable*.

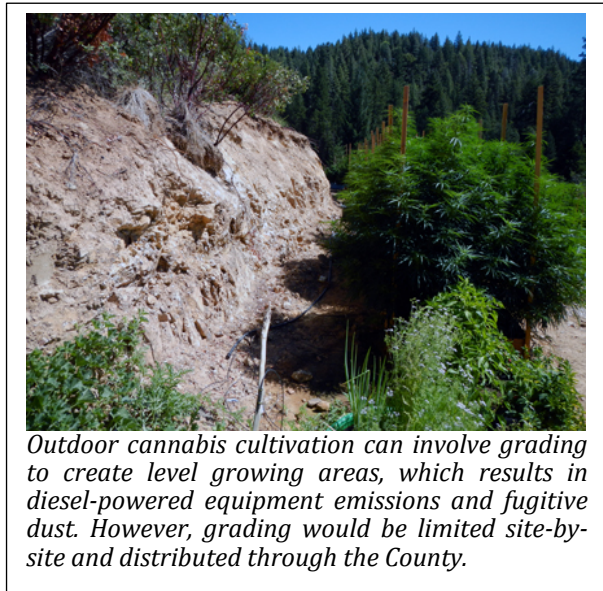
Impact AQ-3. Commercial cannabis cultivation and manufacturing under the Program could potentially violate an air quality standard or contribute to an air quality violation, and result in a cumulatively considerable net increase of a criteria pollutant for which the County is in nonattainment. Impacts would be significant and unavoidable.

Impact AQ-3.1 – Direct Cultivation/Manufacturing. Direct impacts from the Program are related to air emissions caused by the direct cultivation and/or manufacturing of cannabis in the County. There are generally two types of air emissions; short-term construction generated emissions, and long-term operational generated emissions.

Construction Generated Emissions

The main sources of construction-related fugitive dust emissions include grading, excavation, road construction, and travel of construction vehicles on unpaved surfaces. Fugitive dust is generated when the wheels or blades of construction equipment pulverize and break down surface materials, resulting in dust, which includes PM₁₀. Other sources, such as exhaust from heavy-duty diesel-powered equipment, can also contribute to PM₁₀ levels at and around a construction site.

Depending on the timing of cannabis cultivation and/or manufacturing license processing, construction activities for new cultivation sites and/or manufacturing facilities in the County could begin shortly after adoption of the proposed Program. Construction emissions would occur during each phase of construction, including demolition, grading/excavation, and building construction. However, the specific construction details such as scheduling/phasing, equipment, building construction size, and grading for future cultivation and manufacturing projects in the County is unknown at this time and would vary from year to year. Therefore, it is difficult to quantify the construction-related emissions that may potentially occur. For example, construction activities for some outdoor cultivation sites may involve excavation of soil to level a site that would generate emissions, such as diesel fumes from heavy equipment, while other sites may already be suited for outdoor cultivation, and would not need the use of heavy equipment and its associated emissions. Additionally, the construction of new buildings, if needed, for indoor cultivation or manufacturing facilities, would likely generate greater construction emissions than the reuse of existing warehouses or buildings for the same uses.



Construction timing for individual projects is also unknown and the potential exists for multiple construction projects to overlap or occur concurrently, increasing construction-related emissions during such time periods. However, it is likely that construction of new cultivation or manufacturing sites would be distributed around the County, although expected to be concentrated in the South County, and would represent an incremental increase in air emissions as individual sites are developed over time. Further, the MBUACPD guidelines recognize the difficulty of accurately

estimating fugitive emissions from earth moving and provide general area guidelines as a screening value. Up to 8.2 acres may be graded with minimal earthmoving, or 2.2 acres may be graded and excavated without exceeding the PM₁₀ significance threshold of 82 lbs/day. It is likely that cannabis sites that require earthmoving would not exceed these screening thresholds, since the average cultivation canopy size is approximately 3,000 sf based on the County's license registration data, and most cultivation is expected to occur within existing greenhouses. In addition, all construction under the Program is required to abide by the rules and regulations contained in SCCC Chapter 16.20, Grading Regulations, which requires dust control from grading operations. Therefore, direct impacts to air quality due to short-term construction would be *less than significant* for both the Project and the More Permissive Project.

Operation Generated Emissions

The County is currently in nonattainment-transitional for ozone (VOC and NO_x are ozone precursors), nonattainment for PM₁₀, and unclassified for CO. These criteria pollutants are of concern in the County, and the Program would have a significant impact on air quality if its emissions are over the thresholds for any of these criteria pollutants. NO_x and VOCs are the primary compounds, or precursors, contributing to the formation of ozone, with the main contributors of emissions being on-road mobile sources. Primary PM₁₀ (inhalable particulate matter) is considered a localized pollutant, and is often caused by road dust from vehicles operating on unpaved surfaces. Secondary PM₁₀ can be formed in the atmosphere through chemical reactions involving gases. PM₁₀ emissions are caused by entrained road dust, windblown dust, agricultural tilling operations, waste burning, construction, mobile sources, and industrial processes. CO is directly emitted from combustion engines and can have localized impacts, primarily in areas of heavy traffic congestion. Motor vehicles contribute most CO emissions, with electric utilities, fires, and other mobile and miscellaneous sources making up the rest.

A main source of long-term operation-related emissions under the Program would be motor vehicles traveling to and from the cultivation and/or manufacturing facilities, which produce VOC, NO_x, PM₁₀, and CO emissions. Stationary source emissions, including VOC and NO_x, are another type of long-term operation-generated emissions under the Program, and would include indoor and greenhouse cultivation sites running hydrocarbon fuel-powered equipment.

Operation-generated criteria pollutant emissions from direct impacts of cannabis cultivation were estimated using CalEEMod. Table 3.3-7 summarizes the emissions from future potential indoor, greenhouse, and outdoor cannabis cultivation combined based on the County's license registration data and expected new cultivation under the Program. Most criteria pollutant emissions are associated with estimated employee mobile trip emissions from traveling to and from cultivation facilities for work (see also Section 3.13, *Transportation and Circulation*). Additional emissions would be associated with manufacturing.

Table 3.3-7 Operational Emissions from Indoor, Greenhouse, and Outdoor Cannabis Cultivation Under the Program

		ROG	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Emission Type	Peak Daily Operational Emissions (lbs/day)						
Direct & Onsite	Area	1.8731	0.0079	0.8537	0	0.0031	0.0031
	Energy	0	0	0	0	0	0
Indirect & Offsite	Mobile	55.1693	250.9717	845.0265	1.9145	157.7832	44.4311
TOTAL		57.0425	250.9796	845.8802	1.9145	157.7862	44.4342
<i>Threshold</i>		<i>137 (direct + indirect)</i>	<i>137 (direct + indirect)</i>	<i>550 (direct only)</i>	<i>150 (direct only)</i>	<i>82 (onsite only)</i>	<i>--</i>
Above Threshold?		NO	YES	NO	NO	NO	--

Notes: Indirect emissions come from mobile sources that access the project site but generally emit offsite; direct emissions are emitted onsite (e.g., stationary sources, onsite mobile equipment). Operational emissions are estimated using CalEEMod for area, energy, and mobile source emissions (see Appendix F for detailed CalEEMod assumptions and reports).

Source: MBUAPCD 2008.

The Program's prohibition of generator use would remove at least 133 generators from use in the County. This would have a nominal decrease in existing diesel emissions. These emissions are already below the threshold, but the reduction of 133 generators would further reduce diesel emissions.

The Program would exceed the MBUAPCD operational emission threshold for NO_x (see Table 3.3-7), which is an ozone precursor; ozone is currently designated as nonattainment-transitional in the County. Therefore, since the Program would contribute to an air quality violation and result in a cumulatively considerable net increase of a criteria pollutant for which the County is in nonattainment, direct impacts to air quality would be *potentially significant* for both the Project and the More Permissive Project.

Mitigation Measures

Implement MM AQ-2.1. Implement TDM Measures. To reduce operation generated NO_x emissions related to offsite mobile emissions caused by implementation of the Program, MM AQ-2.1, addressing implementation of TDM measures, shall apply to Impact AQ-3.1.

Post-Mitigation Level of Impacts

With implementation of MM AQ-2.1, direct impacts due to offsite mobile emissions generated by employee trips to and from cannabis cultivation and/or manufacturing sites would be reduced. However, due to the inability to ensure that all sites are implementing these TDM measures on a regular basis and the inability to quantify the mobile emissions reductions, direct residual impacts associated with Impact AQ-3.1 would be *significant and unavoidable*.

Impact AQ-3.2 – Indirect Cultivation/Manufacturing. Indirect impacts of the Program would result from air emissions due to the construction and operation of up to 228 new residential units required to cultivate, along with any associated roads, utility infrastructure, and site improvements to support onsite cannabis cultivation operations. Residences would be required for eligible parcels within A, RA, TP, and SU zone districts. Further, the interpretation of the County's Fire Code relative to cannabis-

related structures would require development of up to 568 large tanks for fire water, vegetation management up to 100 feet around each structure, and 20-foot wide paved roads to access the structure with adequate turnaround area.

Construction Generated Emissions

The construction of up to 228 new houses and associated infrastructure would be induced by the Program, since there are already several eligible parcels that have existing houses. Construction of houses and associated development would most likely be spread out over the life of the Program, representing incremental short-term emissions occurring over a long period. Moreover, the additional structures required by the County's Fire Code would require grading, paving, architectural coatings, and other construction activities, which would be distributed and would occur incrementally as each eligible site is licensed. These construction activities could have adverse effects on air quality. However, the MBUACPD guidelines apply general area guidelines as a screening value for grading, where up to 8.2 acres may be graded with minimal earthmoving or 2.2 acres may be graded and excavated without exceeding the PM₁₀ significance threshold of 82 lbs/day. It is likely that cannabis sites that require earthmoving for residences or other site improvements would not exceed these screening thresholds, since a typical rural home site development would typically require between 0.5 and 1 acre of grading. In addition, all construction under the Program is required to abide by the rules and regulations contained in SCCC Chapter 16.20, Grading Regulations, which requires dust control from grading operations. Therefore, indirect impacts related to construction generated emissions would be *less than significant* for both the Project and the More Permissive Project.

Operation Generated Emissions

Air emissions produced by the operation of new houses and associated infrastructure under the Project would be characteristic of a typical rural single family home's emissions, and would constitute an incremental increase in criteria pollutants in the County by itself; however, as emissions from indirect impacts are considered in addition to direct impact emissions, they would add onto the already significant levels of NO_x, (see Table 3.3-7 above). Therefore, indirect impacts related to operation generated emissions would be *significant and unavoidable* for both the Project and the More Permissive Project.

3.3.6.2 Summary of Program Impacts and Proposed Mitigation Measures

Table 3.3-8 below provides a summary of the air quality impacts resulting from the Program and proposed mitigation measures.

Table 3.3-8 Summary of Air Quality Impacts

Air Quality Impacts	Level of Significance	Mitigation Measures	Post-Mitigation Level of Significance	
			Project	More Permissive Project
Impacts from Commercial Cannabis Cultivation and Cannabis Product Manufacturing				
Impact AQ-1. Commercial cannabis cultivation and manufacturing under the Program could potentially expose sensitive receptors to substantial pollutant concentrations and create objectionable odors affecting a substantial number of people. Impacts would be less than significant with mitigation.				
Direct	Potentially Significant	MM AQ-1.1. Siting for Odor Abatement MM AQ-1.2. Greenhouse Odors MM AQ-1.3. Prohibit Cannabis Material Burning MM AQ-1.4. Consistency of Pesticide Use Setbacks MM AQ-1.5. Open Air Extraction Area Setbacks	Less than significant with Mitigation	Less than significant with Mitigation
Indirect	Less than significant	None required.	Less than significant	Less than significant
Impact AQ-2. Commercial cannabis cultivation and manufacturing under the Program could be potentially inconsistent with the MBUAPCD AQMP. Impacts would be significant and unavoidable.				
Direct	Potentially Significant	MM AQ-2.1 Implement TDM Measures	Significant and Unavoidable	Significant and Unavoidable
Indirect	Potentially Significant	None required	Significant and Unavoidable	Significant and Unavoidable
Impact AQ-3. Commercial cannabis cultivation and manufacturing under the Program could potentially violate an air quality standard or contribute to an air quality violation, and result in a cumulatively considerable net increase of a criteria pollutant for which the County is in nonattainment. Impacts would be significant and unavoidable.				
Direct	Potentially Significant	MM AQ-2.1. Implement TDM Measures	Significant and Unavoidable	Significant and Unavoidable
Indirect	Potentially Significant	None required	Significant and Unavoidable	Significant and Unavoidable

3.3.6.3 Secondary Impacts

Impact AQ-4. New or increased unregulated commercial cannabis cultivation and cannabis product manufacturing under the Program could potentially expose sensitive receptors to substantial pollutant concentrations and create objectionable odors affecting a substantial number of people, be potentially inconsistent with the MBUAPCD AQMP, and potentially violate an air quality standard or contribute to an air quality violation, and result in a cumulatively considerable net increase of a criteria pollutant for which the County is in nonattainment. Impacts would be significant and unavoidable.

Impact AQ-4. – Secondary Cultivation/Manufacturing. The secondary impacts of the Program relate to air emissions and odors produced by the construction and operation of unregulated cannabis cultivation and manufacturing in remote areas of the County. Potential sources of air pollution and objectionable odors from unregulated sites include the use of diesel or gasoline generators, not using commercial air scrubbers on indoor cultivation or manufacturing operations, and not observing setbacks so that the strong odor associated with cannabis, especially during the flowering phase, would disturb nearby sensitive receptors. Some existing cannabis cultivators and/or manufacturers, as well as new operators who are not eligible for a license, would be excluded from licensing by the proposed Program standards, and would not necessarily adhere to restrictions and setbacks of the Program, which would result in a greater potential to cause adverse air pollution and odors effects. Unregulated cannabis cultivators/manufacturers would also continue to contribute to increased NO_x emissions due to vehicle travel to and from sites if they expand or establish new sites.

Construction of potential future unregulated cultivation and/or manufacturing sites and accessory structures would likely not comply with SCCC Chapter 16.20, *Grading Regulations*, and so would produce more fugitive dust, particulate matter, and exhaust from grading and other construction-related activities on an ongoing basis. Operation of these unregulated sites would also not comply with the Program's requirements and regulations, and as such would produce more operation-related emissions than licensed cultivation and manufacturing operations. For example, unregulated sites may utilize portable diesel and gasoline generators to supply their energy, which contribute to PM₁₀, PM_{2.5}, and ozone precursor emissions when operating for extended periods of time. Unregulated manufacturing operations could involve production of butane honey oil (BHO) through volatile open loop extraction processes, which have the potential to cause explosions and contribute to harmful air emissions. In addition, unregulated cultivation sites would potentially burn trees and brush from site clearance, and burn their agricultural waste rather than taking it to a landfill or composting it, which would contribute to PM₁₀ emissions.

Therefore, secondary impacts related to air emissions and objectionable odors would be *potentially significant* for both the Project and the More Permissive Project.

Mitigation Measures

Implement MM AT-1.3a. Sustained Enforcement Program. To reduce secondary impacts related to air emissions and objectionable odors associated with unregulated cannabis cultivation/manufacturing and related development activities, MM AT-1.3a, addressing County implementation of the Unlicensed Cannabis Cultivation and Manufacturing Enforcement and Compliance Program, shall apply to Impact AQ-4.

Implement MM AT-1.3b. Annual Survey and Monitoring Report. To reduce secondary impacts related to air emissions and objectionable odors associated with unregulated cannabis cultivation/manufacturing and related development activities, MM AT-1.3b, addressing County criteria for an Annual Survey and Monitoring Report of licensed activities as well as illegal activities, including recommendations regarding enforcement staffing and resources, shall apply to Impact AQ-4.

Implement MM AQ-1.3. Prohibit Cannabis Material Burning. To reduce PM₁₀ emissions and objectionable odors related to burning of cleared vegetation and/or agricultural waste, MM AQ-1.3 shall be implemented as part of the County's enforcement effort for non-licensed cannabis operations.

Post-Mitigation Level of Impacts

With implementation of MMs AT-1.3a and AT-1.3b, unregulated cannabis cultivation and/or manufacturing would be reduced over time either through enforcement/closure of the grow sites or the permitting and licensing of new grow sites. Implementation of MM AQ-1.3 would reduce emissions related to burning of waste.

However, due to the high likelihood for additional or expanded unregulated cannabis cultivation and manufacturing activities regardless of the enforcement and annual survey and monitoring programs, secondary residual impacts associated with Impact AQ-4 would be *significant and unavoidable*.

Since objectionable odors associated with cannabis cultivation and manufacturing are easily discernible and more likely to be reported, it is possible to detect and enforce upon unregulated sites, making the enforcement program more effective. Therefore, secondary residual impacts related to objectionable odors would be *less than significant with mitigation* for both the Project and the More Permissive Project.

3.3.6.4 Cumulative Impacts

The impacts of the Program would be combined with cumulative impacts resulting from development under plans and projects identified in Section 3.0.4, *Cumulative Project Scenario*. Such future development would increase operational mobile emissions in the County and would expose new residents and property to NO_x. Future housing and structural development projects would incrementally contribute to these cumulative impacts.

Inconsistency with the AQMP is considered a significant cumulative adverse air quality impact. Projects which are not consistent with the AQMP have not been accommodated in the AQMP and will have a significant cumulative impact on regional air quality unless emissions are totally offset. Since it is not possible to completely offset NO_x emissions generated by the Program, cumulative impacts would be *significant and unavoidable*.