

5.6 AIR QUALITY

Greenhouse *development* buildout would generate both temporary construction emissions and long-term operational emissions. Use of construction and grading equipment would emit carbon monoxide and ozone precursors. In addition, the grading and vehicle activity on the site would create dust and suspended particulates. Because the construction impacts are temporary in nature, they are considered Class II, significant, but mitigable. Development and operation of greenhouses would reduce particulate matter emissions in the long-term by reducing open field agriculture in the Carpinteria Valley. Project buildout would increase emissions of ozone precursors due to increased vehicular traffic and operation of industrial boilers; however, emissions from individual projects are not anticipated to be significant. Cumulative impacts are not considered significant because project-related emissions are within forecasts in the 1998 Clean Air Plan. Recommended mitigation measures for both construction and operation would reduce overall air quality impacts to less than significant levels.

5.6.1 Setting

The physical and regulatory air quality setting of the Carpinteria Valley and the County of Santa Barbara are described in detail in the 1998 Clean Air Plan (CAP), which is incorporated by reference. The 1998 CAP is available for review at local libraries, Carpinteria City Hall, and at the Santa Barbara County Air Pollution Control District at 26 Castilian Drive, Goleta, California. The following summarizes information from the 1998 CAP and other relevant documents.

a. Climate and Meteorology. The semi-permanent high pressure system west of the Pacific coast strongly influences California's weather, creating sunny skies throughout the summer, and controlling the pathway and occurrence of low pressure weather systems that bring rainfall to the area during October through April. Cool, humid marine air causes frequent fog and low clouds along the coast, generally during the night and morning hours in the late spring and early summer months. This pattern reverses at night as the land mass cools and down valley and offshore nighttime breezes are prevalent. Occasionally, stronger winds are produced by "Santa Ana" winds, which are typically hot, dry northerly winds. Wind speeds associated with Santa Ana conditions are generally 15-20 mph, but can reach over 60 mph.

Daytime summer temperatures in the area average in the 70s (Fahrenheit). Minimum nighttime summer temperatures are typically in the 50s, while the winter high temperature tends to be in the 50s. Minimum winter temperatures are in the 40s, though lows in the 30s and freezing conditions occur occasionally each winter. Average annual rainfall in the Carpinteria Valley is about 15 to 16 inches.

Two types of temperature inversions (warmer air on top of colder air) are created in the area, subsidence and radiational (surface). The subsidence inversion is a regional effect created by the Pacific high in which air is heated as it is compressed when it flows from the high pressure area to the low pressure areas inland. This type of inversion generally forms at about 1,000 to 2,000 feet and can occur throughout the year, but is most evident during the summer months. Surface inversions are formed by the more rapid cooling of air near the ground during the night, especially during winter. This type of inversion is typically lower and is generally accompanied by stable air. Both types of inversions limit the dispersal of air pollutants within the regional airshed.

b. Air Pollution Regulation. The federal and state governments have been empowered by the federal and state Clean Air Acts to regulate the emission of airborne pollutants and have established ambient air quality standards for the protection of public health. The United States Environmental Protection Agency (USEPA) is the federal agency designated to administer air quality regulation, while the Air Resources Board (ARB) is the state equivalent in the California Environmental Protection Agency. Local control in air quality management is provided by the ARB through county-level Air Pollution Control Districts (APCDs). The ARB has established state air quality standards and is responsible for control of mobile emission sources, while the local APCDs are responsible for enforcing standards and regulating stationary sources. The ARB has established 14 air basins statewide. The Carpinteria Valley is located in the South Central Coast Air Basin and is under the jurisdiction of the Santa Barbara County APCD.

Federal and state standards have been established for ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulates less than 10 microns in diameter (PM₁₀), and lead (Pb). California has also set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles. The U.S. EPA adopted stricter air quality standards for ozone and PM₁₀ in 1997. The EPA intended to replace the existing 1-hour ozone standard with a new 8-hour averaging time and lowered the concentration level from 0.12 to 0.8 ppm. However, in May 1999, the US Court of Appeals prohibited the EPA from enforcing the new standard, and the existing one-hour standard will continue to apply. The court removed the new PM₁₀ standard, and the previous standard of 150 micrograms per cubic meter for a 24-hour period will continue to apply. The court left in place the new annual PM_{2.5} standard (particulates of less than 2.5 microns in diameter), which was set at 15 micrograms per cubic meter spatially averaged across an area. The new 24-hour PM_{2.5} standard is based on the 3-year average of the 98th percentile of the 24-hour concentrations measured at a monitoring station. However, the Court has invited comments on this standard, and it may be retained, changed, or removed. Table 5.6-1 lists the current Federal and State Standards for the regulated pollutants.

Table 5.6-1 Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Primary Standards	California Standard
Ozone	1-Hour	0.12 PPM	0.09 PPM
Carbon Monoxide	8-Hour	9.0 PPM	9.0 PPM
	1-Hour	35.0 PPM	20.0 PPM
Nitrogen Dioxide	Annual	0.05 PPM	---
	1-Hour	---	0.25 PPM
Sulfur Dioxide	Annual	0.03 PPM	---
	24-Hour	0.14 PPM	0.04 PPM
	1-Hour	---	0.25 PPM
Suspended Particulates (PM ₁₀)	Annual	50 µg/m ³	30 µg/m ³
	24-Hour	150 µg/m ³	50 µg/m ³
Lead	30-Day Average	---	1.5 µg/m ³
	3-Month Average	1.5 µg/m ³	---

ppm = parts per million

µg/m³ = micrograms per cubic meter

Source: California Air Resources Board

The criteria pollutants and their potential health effects are further described in the following paragraphs.

Carbon Monoxide. Carbon monoxide is a local pollutant that is found in high concentrations only very near the source. The major local source of carbon monoxide, a colorless, odorless, poisonous gas, is automobile traffic. Elevated concentrations, therefore, are usually only found near areas of high traffic volumes. Carbon monoxide's health effects are related to its affinity for hemoglobin in the blood. At high concentrations, carbon monoxide reduces the amount of oxygen in the blood, causing heart difficulties in people with chronic diseases, reduced lung capacity and impaired mental abilities.

Ozone. Ozone is produced by a photochemical reaction (triggered by sunlight) between nitrogen oxides (NO_x) and reactive organic gases (ROG). Nitrogen oxides are formed during the combustion of fuels, while reactive organic gases are formed during combustion and evaporation of organic solvents. Because ozone requires sunlight to form, it mostly occurs in concentrations considered serious between the months of April and October. Ozone is a pungent, colorless toxic gas with direct health effects on humans including respiratory and eye irritation and possible changes in lung functions. Groups most sensitive to ozone include children, the elderly, persons with respiratory disorders, and people who exercise strenuously outdoors.

Suspended Particulates. PM₁₀ is small particulate matter measuring no more than 10 microns in diameter. PM₁₀ is mostly composed of dust particles, nitrates and sulfates. PM₁₀ is a by-product of fuel combustion and wind erosion of soil and unpaved roads, and is directly emitted into the atmosphere through these processes. PM₁₀ is also created in the atmosphere through chemical reactions. Fine particulate matter poses a serious health threat to all groups, but particularly to the elderly, children, and those with respiratory problems. More than half of the fine particulate matter that is inhaled into the lungs remains there, which can cause permanent lung damage. These materials can damage health by interfering with the body's mechanisms for clearing the respiratory tract or by acting as carriers of an absorbed toxic substance.

Nitrogen Dioxide. Nitrogen Dioxide (NO₂) is a by-product of fuel combustion, with the primary source being motor vehicles and industrial boilers and furnaces. The principal form of nitrogen oxide produced by combustion is nitric oxide (NO), but NO reacts rapidly to form NO₂, creating the mixture of NO and NO₂ commonly called NO_x. Nitrogen dioxide is an acute irritant, but at typical atmospheric concentrations, it is only potentially irritating. A relationship between NO₂ and chronic pulmonary fibrosis may exist, and an increase in bronchitis in young children at concentrations below 0.3 parts per million (ppm) may occur. Nitrogen dioxide absorbs blue light and causes a reddish brown cast to the atmosphere and reduced visibility. It can also contribute to the formation of PM₁₀ and acid rain.

c. Current Ambient Air Quality. The APCD is required to monitor air pollutant levels to assure that the air quality standards are met, and if they are not met, to also develop strategies to meet the standards. Depending on whether or not the standards are met or exceeded, the air basin is classified as being in "attainment" or as "nonattainment." Santa Barbara County is in attainment for all standards except the federal and state ozone standards, and the state standard for PM₁₀. The County's federal status for ozone was downgraded from "Moderate Non-attainment" to "Serious Non-attainment" because the County failed to meet the November 15, 1996 deadline for attainment of the federal 1-hour standard.

One air quality monitoring station is located in the Carpinteria Valley located in Gobernador Canyon. This station measures ozone and nitrogen dioxide. The nearest station measuring PM₁₀ and carbon monoxide is at the Santa Barbara – W. Carillo St. station. Table 5.6-2 summarizes the annual air quality data for 1995 - 1997 for the local airshed. As illustrated by the data below, the Carpinteria area generally has good air quality.

Table 5.6-2 Summary of Air Quality in the Carpinteria Valley

Year	Ozone			Number of Days Above State Particulate Standard	
	Days Above State 1-hr. Standard	Days Above Fed. 1-hr. Standard	Days Above Fed. 8-hr. Standard	Days Above State 24-hr. Standard	Days Above Fed. 24-hr. Standard
1995	7	0	3	2	0
1996	8	1	4	1	0
1997	4	0	1	1	0

Source: ARB, Annual Air Quality Data Summaries

State law exempts agricultural stationary sources from permit review. However, retail nursery operations are subject to APCD permits for stationary source equipment. Both retail and wholesale nurseries are still subject to APCD prohibitory rules that address nuisance issues such as dust and visible emissions.

Sources of pollution from stationary agricultural equipment are classified as *area sources*. Area sources are not large enough to be tracked individually, but when added together they can represent a large quantity of pollution. Emissions inventories for stationary agricultural equipment are calculated using a standard generation rate (determined by CARB) applied to the total acreage of designated agricultural land within Santa Barbara County.

The Santa Barbara County APCD has prepared an inventory of annual emissions as part of the 1998 CAP. Total emissions by major source category are shown in Table 5.6-3. Mobile sources, including agriculture-related vehicle trips, account for the greatest proportion of annual countywide emissions of NO_x and CO. Other than natural sources (biomass, petroleum seeps, fires), mobile sources also account for the largest share of ROG emissions. Areawide emissions, which include particulate matter (PM) associated with farming activity, are the largest source of PM emissions. Farming operations (tilling, harvesting, cattle feedlots) account for an estimated 1,941.80 tons of PM emissions annually, or about 14% of countywide emissions.

Table 5.6-3 Santa Barbara County 1996 Emissions Inventory

Emission Source	Annual Emissions (in tons)				
	ROG	NO _x	CO	Sox	PM
Stationary Sources	2,838.26	2,158.53	1,550.52	552.11	554.18
Areawide Sources	3,419.81	494.18	7,882.08	8.19	10,584.25
Mobile Sources	8,907.12	12,877.86	82,531.99	304.32	571.86
Natural Sources	29,295.23	1,058.08	11,403.93	0.00	1,842.89
Total	44,460.42	16,588.65	103,368.52	864.62	13,553.18

Source: Santa Barbara County APCD, 1998 Clean Air Plan, Appendix A.

5.6.2 Impact Analysis

a. Methodology and Significance Thresholds. The analysis of air quality impacts follows the guidance provided in the Santa Barbara County APCD *Scope and Content of Air Quality Sections in Environmental Documents* (September 1997) and the Santa Barbara County *Thresholds of Significance for Air Quality Impacts* (March 1994). Pollutant emissions were quantified using stationary source factors from the USEPA AP-42 *Compilation of Air Pollutant Emissions Factors* (1985) and URBEMIS7G. Construction calculations followed the methodologies recommended in the South Coast Air Quality Management District *CEQA Air Quality Handbook* (November 1993).

A significant adverse air quality impact may occur when a project individually or cumulatively:

- *Interferes with progress towards the attainment of the ozone standard by releasing emissions which equal or exceed the established long term quantitative thresholds for pollutants; or*
- *Causes an exceedance of a state or federal ambient air quality standard for any criteria pollutant (as determined by modeling); or*
- *Is inconsistent with the adopted federal and state air quality plans of Santa Barbara County.*

The Santa Barbara County APCD has established operational significance thresholds of 25 pounds per day of ROC and NO_x for individual development projects. However, because the proposed project is a change in the zoning ordinance that could affect the ultimate land use on numerous individual projects, these thresholds are not applicable to the forecast buildout projections. Instead, based on the first criteria listed above, impacts are considered significant if emissions associated with greenhouse buildout as controlled through the proposed project would constitute a substantial increase in emissions (1% or more) as compared to regional emission inventories be inconsistent with the Clean Air Plan, or if any individual greenhouse project that could be accommodated in the Carpinteria Valley would generate emissions over the 25 pounds-per-day thresholds.

Impacts relating to carbon monoxide concentrations are considered significant if greenhouse buildout would create a CO “hot spot” where the California one-hour standard of 20 parts per million (ppm) or the 8-hour standard of 9 ppm is exceeded.

The Santa Barbara County APCD has not established quantitative thresholds of significance for short-term emissions. However, because the County is in nonattainment for PM₁₀, construction mitigation measures are required for all projects involving earthmoving activities regardless of size or duration. According to the APCD, implementation of these required measures would reduce fugitive dust emissions to a level considered less than significant.

b. Project Impacts. The AG-I-OF zone district retains the provisions of the existing AG-I zone district except for greenhouse development of 20,000 sf or more. The conversion of land to open field and orchard agriculture and the construction of less than 20,000 sf of greenhouse development per legal lot are permitted under the existing zone district, as well as the proposed AG-I-OF. As stated in Section 3.0, most land that is suitable for greenhouse cultivation has already been converted to agriculture. Eliminating the opportunity to construct greenhouses on slopes greater than 5% will not create an incentive to bring more natural lands into cultivation.

as greenhouse development would not have occurred on these slopes anyway. Furthermore, conversion of natural lands to open field and orchard cultivation could occur irrespective of the proposed project. As discussed in Section 3.0, Environmental Setting, these zone district provisions and the impacts associated with their continuation are a part of the environmental baseline and will continue whether or not the project is approved. Therefore, there are no reasonably foreseeable significant air quality impacts associated with the proposed AG-I-OF zone district.

The project impacts identified below would result from potential buildout of 3.0 million sf of greenhouse development in the proposed AG-I-CARP zone district.

Impact AQ-1 Greenhouse construction would result in temporary emissions of air pollutants, including PM₁₀.

Construction activity associated with the development of greenhouses would temporarily increase emissions of ozone precursors and fugitive dust. Such emissions would occur as individual greenhouses are built. Although construction schedules are not known, construction activity would be expected to occur from time to time over a number of years. Individual construction projects would be expected to last from several weeks to several months. The grading phase of construction would generally generate the greatest amount of emissions because it typically involves the use of multiple pieces of construction equipment and involves substantial earth movement.

Construction emissions from any individual project cannot be predicted with any accuracy at this time. In addition, it is not known whether separate construction projects might occur simultaneously at some point in the future. Nevertheless, because the region is in nonattainment for PM₁₀, construction-related impacts are considered potentially significant and mitigation measures for construction emissions are required by the APCD.

Impact AQ-2 Greenhouse buildout would incrementally reduce particulate emissions, but would increase ozone precursor emissions.

Buildout of all potential greenhouse development would reduce existing particulate emissions associated with current open field agriculture. As discussed in the Setting, about 14% of countywide PM emissions are attributable to agricultural activity. Greenhouse development would therefore have a beneficial effect on PM levels in the Carpinteria Valley.

Emissions of ozone precursors (ROG and NO_x) would increase due to the increased intensity of operations on greenhouse parcels. Operational mobile source emissions associated with full buildout of potential greenhouse development are shown in Table 5.6-4. These emissions are the result of increased motor vehicle traffic associated with greenhouse development, including commute trips, visitor trips, and truck shipments.

Emissions of both ROG and NO_x associated with project-related motor vehicle activity would constitute only a minute fraction (less than 0.1%) of regional emissions of these pollutants. In addition, the maximum buildout on any individual property (312,049 square feet on parcel 004-003-004) constitutes only about 10% of the total greenhouse buildout potential in the Carpinteria Valley. Assuming a pro rata share of the overall emissions associated with greenhouse

buildout, the largest potential project would generate roughly 5.6 pounds per day of ROG and 3.5 pounds per day of NO_x. Because these totals are below the APCD's 25 pounds-per-day thresholds for both pollutants, significant mobile source impacts from individual greenhouses are not anticipated.

Table 5.6-4 Project Mobile Source ROG and NO_x Emissions

Scenario	Emissions (lbs/day)	
	ROG	NO _x
Summer Day	52.7	30.7
Winter Day	56.4	34.9
1996 Emission Forecast*	243,618.7	90,896.7

See Appendix G for calculations. Emission estimates are based upon traffic data provided in Section 4.5.

* Annual forecast divided by 365.

~~Project buildout would also be expected to generate increased NO_x emissions from industrial boilers, steam generators and process heaters. These are used for various applications to provide steam, heat and hot water. In Santa Barbara County there are currently an estimated 212 units, which cumulatively emit about 160 tons of oxides of nitrogen per year (Santa Barbara County APCD, 1998). This constitutes about 0.1% of total countywide NO_x emissions in 1996. The size of boilers that might be used at individual greenhouse operations is not known. However, based upon the above data, the average boiler in the County generates about 0.75 tons of NO_x per year, or about 4.1 pounds per day (assuming 365 operating days per year). When added to the 3.5 pounds per day estimate for mobile emissions (see above), this would bring total emissions from individual greenhouses to an estimated 7.6 pounds per day. This remains below the County's 25 pounds per day threshold; therefore, impacts are not considered significant.~~

County of Santa Barbara Negative Declaration 96-ND-08 (1996) calculated the NO_x emissions for a boiler and four water heaters that were proposed to supply heat to a 364,076 square foot plant shelter. The analysis for this environmental document indicated that the boiler and water heaters would all operate at 1.9 million Btu, with the boiler operating for 6 hours/day and the heaters operating for 14 hours/day for a winter day. Emissions were based on test data for a specific brand of heater and total emissions were estimated at 20.29 pounds/day. Since the largest greenhouse that would be built under the proposed project scenario would be approximately 312,000 square feet, this analysis indicates that no individual project would exceed the daily NO_x threshold. In addition, a new revision to AP-42 Section 1.4 *Natural Gas Combustion* (July 1998) provides revised emission factors for boilers. The new emission rate for uncontrolled small boilers (less than 100 MMBtu) is 100 pounds/10⁶ scf of natural gas or about 0.098 lbs/MMBtu/hour. Based on the scenarios analyzed for the four water heaters and boiler under 96-ND-08, estimated maximum stationary NO_x production is proportionately estimated at about 3.7 pounds per day, or slightly less than the estimate of 4.1 pounds per day provided in the Draft EIR.

The square footage of greenhouses that use boilers and hot water heaters is unknown since many of the older structures do not use heating units. It is assumed that about 50% of the greenhouses are so equipped. As discussed above, the 25 lbs/day threshold is not appropriate

for an analysis of cumulative effects. Assuming that about 50% of the existing greenhouses use hot water for greenhouse heating and that emissions are uncontrolled, then existing emissions would total approximately 135 lbs/day of NOx during the winter. All new greenhouses would be expected to employ this technology, therefore the additional cumulative NOx emissions associated with the project buildout scenario would be 95.6 lbs/day.

Based on the methodology discussed above, agriculture-related combustion emissions are specifically accounted for in the Clean Air Plan because the natural gas fuel use provided by SoCal Gas contains agricultural fuel use. Since the emissions are accounted for in the Clean Air Plan, and in the absence of established thresholds to assess cumulative NOx emissions from greenhouse operations, and since the project would not serve to alter land uses, only to limit the manner and location in which greenhouses could be constructed, the proposed project would be consistent with the Clean Air Plan.

5.6.3 Mitigation Measures

a. Existing Policies\Ordinances. Included in Section 4.0 of this EIR, *Consistency with Locally Adopted Plans and Policies*, is a discussion of existing County Comprehensive Plan policies that address air quality issues. Existing policies within the Land Use and Circulation Element of the Santa Barbara County Comprehensive Plan and the Local Coastal Plan do not address development within rural areas.

b. Proposed Development Standards. No specific development standards are proposed in the AG-I CARP or AG-I-OF zoning ordinances to address air quality.

c. Additional Proposed Mitigation Measures. The following measures are required by the APCD to reduce construction-related air quality impacts:

Mitigation AQ-1: The following measures are required for all projects involving earthmoving activities regardless of the project size or duration. Proper implementation of these measures would adequately mitigate fugitive dust emissions. (*Addresses Impact AQ-1*)

- During construction, use water trucks or sprinkler systems to keep all areas of vehicle movement damp enough to prevent dust from leaving the site. At a minimum, this should include wetting down such areas in the late morning and after work is completed for the day. Increased watering frequency should be required whenever the wind speed exceeds 15 mph. Reclaimed water should be used whenever feasible.
- Minimize amount of disturbed area and reduce on-site vehicle speeds to 15 mph or less.
- Where appropriate, gravel pads must be installed at all access points to prevent tracking of mud onto public road.
- If importation, exportation, and stockpiling of fill material is involved, soil stockpiled for more than two days shall be covered, kept moist, or

treated with soil binders to prevent dust generation. Trucks transporting fill material to and from the site shall be tarped from the point of origin.

- After clearing, grading, earth moving or excavation is completed, treat the disturbed area by watering, or revegetating, or by spreading soil binders until the area is paved or otherwise developed so that dust generation will not occur.
- The contractor or builder shall designate a person or persons to monitor the dust control program and to order increased watering, as necessary, to prevent transport of dust off-site. Their duties shall include holiday and weekend periods when work may not be in progress. The name and phone number of such persons shall be provided to the APCD prior to the issuance of any Coastal Development Permit (CDP) for site grading.
- All dust control requirements shall be shown on the applicable grading and/or building plans.

Mitigation AQ-2: Prior to approval of building permits, the applicant shall agree to comply with APCD dust control mitigation measures. All dust control requirements shall be shown on the applicable grading and/or building plans. (*Addresses Impact AQ-1*)

The following measures are also recommended to further reduce ozone precursor emission.

Mitigation AQ-3: Construction equipment used on the site should meet the following conditions to reduce NO_x emissions (*Addresses Impact AQ-2*).

- The engine size should be the minimum practical size;
- The number of pieces of equipment operating simultaneously should be minimized through efficient management practices;
- Construction equipment should be maintained in tune per manufacturer's specifications;
- Equipment should be equipped with 2 to 4-degree engine timing retard or pre-combustion chamber engines;
- Catalytic converters should be installed, if feasible; and
- Diesel-powered equipment such as booster pumps or generators should be replaced by electric equipment, if feasible.

Mitigation AQ-4: Incorporate energy-saving design solutions to reduce energy consumption by at least 20 percent below current Federal guidelines as specified in Title 24 of the Code of Federal Regulations. Recommended design solutions include, but are not limited to, the following:

- a. Use of light colored water-based paint and roofing materials;
- b. Installation of solar panels for water heating systems and other facilities and/or the use of water heaters that heat water only on demand;
- c. Use of passive solar cooling/heating;

- d. Use of natural lighting;
- e. Use of concrete or other non-pollutant materials in parking lots (if necessary);
- f. Installation of energy efficient lighting;
- g. Use of landscaping to shade buildings and parking lots;

Mitigation AQ-5: All boilers, steam generators, and process heaters proposed at new or expanded greenhouse operations shall utilize low-NOx burners.
(Addresses Impact AQ-2)

5.6.4 Residual Impacts After Mitigation

Impact AQ-1. Fugitive dust generation from short-term construction activities would be mitigated to ***less than significant (Class II)***.

Impact AQ-2. The incremental generation of vehicular PM₁₀ emissions and ozone precursor emissions would be ***adverse, but not significant (Class III)***. The recommended measures would further reduce air pollutant emissions.

5.6.5 Cumulative Impacts

Since the project and nearly all of the cumulative developments are individually insignificant and consistent with adopted land use plans and zoning, cumulative emissions are considered to be accounted for in the modeling and forecasting which factored in the Clean Air Plan. Therefore, cumulative air quality impacts would be considered ***adverse but not significant (Class III)***.