4.2 AIR QUALITY

This chapter examines the degree to which the Specific Plan may result in significant adverse changes to air quality. Both short-term construction emissions occurring from activities such as site grading, as well as long-term effects related to the ongoing operation of the Specific Plan are discussed. The analysis contained herein focuses on air pollution from two perspectives: daily emissions and pollutant concentrations. "Emission" refers to the actual quantity of pollutant, measured in pounds per day. "Concentration" refers to the amount of pollutant material per volumetric unit of air. Concentrations are measured in parts per million (ppm) or micrograms per cubic meter (μg/m3). This section was prepared by Illingworth & Rodkin, Inc.

A. Regulatory Setting

This section summarizes key federal, State and City statutes, regulations and policies that would apply to the project. At the federal level, the United States Environmental Protection Agency (EPA) administers the federal Clean Air Act (CAA). The California Clean Air Act is administered by the California Air Resources Board (CARB) at the State level and by the Air Quality Management Districts at the regional and local levels. The Bay Area Air Quality Management District (BAAQMD) regulates air quality at the regional level, which includes much of the nine-county Bay Area.

1. Federal Laws and Regulations

a. United States Environmental Protection Agency

The EPA is responsible for enforcing the federal CAA. The EPA is also responsible for establishing National Ambient Air Quality Standards (NAAQS). The NAAQS are required under the 1977 CAA and subsequent amendments. The EPA regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain types of locomotives. The agency has jurisdiction over emission sources outside State waters (e.g. beyond the outer continental shelf) and establishes various emission standards, including those for vehicles sold in states other than

California. Automobiles sold in California must meet the stricter emission standards established by the CARB.

2. State Laws and Regulations

a. California Air Resources Board

The CARB, part of the California Environmental Protection Agency, is responsible for meeting the State requirements of the federal CAA, administering the California CAA, and establishing the California Ambient Air Quality Standards (CAAQS). The California CAA, as amended in 1992, requires all air districts in the State to endeavor to achieve and maintain the CAAQS. The CAAQS are more stringent than the corresponding federal standards and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride and visibility reducing particles. The CARB regulates mobile air pollution sources, such as motor vehicles. The agency is responsible for setting emission standards for vehicles sold in California and for other emission sources, such as consumer products and certain off-road equipment. The CARB established passenger vehicle fuel specifications, which became effective on March 1996. The CARB oversees the functions of local air pollution control districts and air quality management districts, which in turn administer air quality activities at the regional and county level. The CARB also monitors ambient air quality throughout the State.

b. Bay Area Air Quality Management District

In 1955, the California Legislature created the Bay Area Air Quality Management District (BAAQMD). The agency is primarily responsible for assuring that the national and State ambient air quality standards are attained and maintained in the Bay Area. The BAAQMD is also responsible for adopting and enforcing rules and regulations concerning air pollutant sources, issuing permits for stationary sources of air pollutants, inspecting stationary sources of air pollutants, responding to citizen complaints, monitoring ambient air quality and meteorological conditions, awarding grants to reduce motor vehicle emissions, conducting public education campaigns, as well as many other activities. The BAAQMD does not have authority to regulate emissions from motor vehicles.

c. Bay Area Clean Air Plan

To protect public health, the BAAQMD has adopted plans to achieve ambient air quality standards. The BAAQMD must continuously monitor its progress in implementing attainment plans and must periodically report to the California Air Resources Board and the EPA. It must also periodically revise its attainment plans to reflect new conditions and requirements.

Air quality plans addressing the California Clean Air Act are developed about every three years. The plans are meant to demonstrate progress toward meeting the more stringent 1-hour O_3 California Ambient Air Quality Standards (CAAQS). The latest plan, which was adopted in January 2006, is called the *Bay Area 2005 Ozone Strategy*. This plan includes a comprehensive strategy to reduce emissions from stationary, area, and mobile sources. The plan objective is to indicate how the region would make progress toward attaining the stricter State air quality standards, as mandated by the California Clean Air Act. The plan is designed to achieve a region-wide reduction of O_3 precursor pollutants through the expeditious implementation of all feasible measures. The plan proposes implementation of transportation control measures (TCMs) and programs such as Spare the Air. Spare the Air is a public outreach program designed to educate the public about air pollution in the Bay Area and promote individual behavior changes that improve air quality. Some of these measures or programs rely on local governments for implementation.

d. Air Pollutants and Ambient Air Quality Standards

The federal and California Clean Air Acts establish ambient air quality standards for different pollutants. The NAAQS were established by the federal Clean Air Act of 1970 (amended in 1977 and 1990) for six criteria pollutants. These criteria pollutants include carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), particulate matter with a diameter less than 10 microns (PM_{10}), sulfur dioxide (SO_2), and lead (Pb). Recently, fine particulate matter or $PM_{2.5}$ was added as a criteria pollutant. Air quality studies generally focus on five pollutants that are most commonly measured and regulated: CO, O_3, NO_2, SO_2, and suspended particulate matter, i.e. PM_{10} and $PM_{2.5}$.

California established ambient air quality standards as early as 1969 through the Mulford-Carrol Act. Pollutants regulated under the California Clean Air Act are similar to those regulated under the federal Clean Air Act. In many cases, California standards are more stringent than the national ambient air quality standards. Federal and State air quality standards are shown in Table 4.2-1. Both the national and California ambient air quality standards have been adopted by the Bay Area Air Quality Management District (BAAQMD).

i. Carbon Monoxide

CO, a colorless and odorless gas, interferes with the transfer of oxygen to the brain. It can cause dizziness and fatigue, and can impair central nervous system functions. CO is emitted almost exclusively from the incomplete combustion of fossil fuels. Automobile exhaust and residential wood burning in fireplaces and woodstoves emit most of the CO in the Bay Area. CO is a non-reactive air pollutant that dissipates relatively quickly, so ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. The highest CO concentrations measured in the Bay Area are typically recorded during the winter.

ii. Ozone

Ground-level ozone is the principal component of smog. Ozone is not directly emitted into the atmosphere, but instead forms through a photochemical reaction of reactive organic gases (ROG) and nitrogen oxides (NO_x), which are known as ozone precursors. Ozone levels are highest from late spring through autumn when precursor emissions are high and meteorological conditions are warm and stagnant. Motor vehicles create the majority of reactive organic gas and nitrogen oxide emissions in the Bay Area. Exposure to levels of ozone above current ambient air quality standards can lead to human health effects such as lung inflammation and tissue damage and impaired lung functioning. Ozone exposure is also associated with symptoms

TABLE 4.2-1 **STATE AND FEDERAL AMBIENT AIR QUALITY STANDARDS**

Pollutant	Averaging Time	State Standards	Federal Standards	
			Primary[a]	Secondary[b]
Ozone	8-hour	0.07 ppm (137μg/m^3)	0.08 ppm (157μg/m^3)	—
	1-hour	0.09 ppm (180 μg/m^3)	—[c]	Same as primary
Carbon monoxide	8-hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	—
	1-hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	—
Nitrogen dioxide	Annual	—	0.053 ppm (100 μg/m^3)	Same as primary
	1-hour	0.25 ppm (470 μg/m^3)	—	—
Sulfur dioxide	Annual	—	0.03 ppm (80 μg/m^3)	—
	24-hour	0.04 ppm (105 μg/m^3)	0.14 ppm (365 μg/m^3)	—
	3-hour	—	—	0.5 ppm (1,300 μg/m^3)
	1-hour	0.25 ppm (655 μg/m^3)	—	—
PM_{10}	Annual	20 μg/m^3 (geometric mean)	—[d]	Same as primary
	24-hour	50 μg/m^3	150 μg/m^3	Same as primary
$PM_{2.5}$	Annual	12 μg/m^3	15 μg/m^3	—
	24-hour	—	35 μg/m^3	—
Lead	Calendar quarter	—	1.5 μg/m^3	Same as primary
	30-day average	1.5 μg/m^3	—	—

Notes: Concentrations are expressed first in units in which they were promulgated. Equivalent units given in parenthesis. (a) Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health. Each state must attain the primary standards no later than 3 years after that state's implementation plan is approved by the EPA. (b) Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. (c) The national 1-hour ozone standard was revoked by the US EPA on June 15, 2005. (d) The annual PM_{10} standard was revoked by the US EPA on September 21, 2006 and a new $PM_{2.5}$ 24-hour standard was established.

such as coughing, chest tightness, shortness of breath, and the worsening of asthma symptoms. The greatest risk for harmful health effects belongs to outdoor workers, athletes, children and others who spend greater amounts of time outdoors during smoggy periods. Elevated ozone levels can reduce crop and timber yields, as well as damage native plants. Ozone can also damage materials such as rubber, fabrics and plastics. In April 2005, the California Air Resources Board approved a new eight-hour standard of 0.07 ppm and retained the one-hour ozone standard of 0.09 ppm after an extensive review of the scientific literature. Evidence from the reviewed studies indicate that significant harmful health effects could occur among both adults and children if exposed to levels above these standards.

iii. Nitrogen Dioxide

NO_2, a reddish-brown gas, irritates the lungs. It can cause breathing difficulties at high concentrations. Like O_3, NO_2 is not directly emitted, but is formed through a reaction between nitric oxide (NO) and atmospheric oxygen. NO and NO_2 are collectively referred to as nitrogen oxides (NOx) and are major contributors to O_3 formation. NO_2 also contributes to the formation of PM_{10} (see discussion of PM_{10} below). Levels of NO_2 in the Bay Area are relatively low.

iv. Sulfur Oxides

Sulfur oxides, primarily SO_2, are a product of high-sulfur fuel combustion. The main sources of SO_2 are coal and oil used in power stations, in industries, and for domestic heating. Industrial chemical manufacturing is another source of SO_2. SO_2 is an irritant gas that attacks the throat and lungs. It can cause acute respiratory symptoms and diminished ventilator function in children. Due to the lack of sources, SO_2 is found at low concentrations in the North Bay region.

v. Suspended Particulate Matter (PM)

Particulate matter (PM) is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size and chemical composition,

and can be made up of many different materials such as metals, soot, soil, and dust. Particles 10 microns or less in diameter are defined as "respirable particulate matter" or "PM_{10}". Fine particles are 2.5 microns or less in diameter ($PM_{2.5}$) and can contribute significantly to regional haze and reduction of visibility. Inhalable particulates come from smoke, dust, aerosols, and metallic oxides. Although particulates are found naturally in the air, most particulate matter found in the area are emitted either directly or indirectly by motor vehicles, industry, construction, agricultural activities, and wind erosion of disturbed areas. Most $PM_{2.5}$ is comprised of combustion products such as smoke. Extensive research reviewed by CARB indicates that exposure to outdoor PM_{10} and $PM_{2.5}$ levels exceeding current ambient air quality standards is associated with increased risk of hospitalization for lung and heart-related respiratory illness, including emergency room visits for asthma. PM exposure is also associated with increased risk of premature deaths, especially in the elderly and people with pre-existing cardiopulmonary disease. In children, studies have shown associations between PM exposure and reduced lung function and increased respiratory symptoms and illnesses. Besides reducing visibility, the acidic portion of PM (nitrates, sulfates) can harm crops, forests, aquatic and other ecosystems. In June 2002, the ARB adopted new ambient air quality standards for PM_{10} and $PM_{2.5}$, resulting from an extensive review of the health-based scientific literature. The U.S. EPA recently updated the 24-hour standard for $PM_{2.5}$ and eliminated the annual PM_{10} standard.

vi. Toxic Air Contaminants (TAC)

TACs are a broad class of compounds known to cause morbidity or mortality (usually because they cause cancer) and include, but are not limited to, the criteria air pollutants listed above. TACs are found in ambient air, especially in urban areas, and are caused by industry, agriculture, fuel combustion, and commercial operations (e.g. dry cleaners). TACs are typically found in low concentrations, even near their source (e.g. diesel particulate matter and benzene near a freeway). Because chronic exposure can result in adverse health effects, TACs are regulated at the regional, State, and federal level. Diesel exhaust is the predominant TAC in urban air and is estimated to represent about two-thirds of the cancer risk from TACs (based on the statewide aver-

age). Diesel exhaust is a complex mixture of gases, vapors and fine particles. This complexity makes the evaluation of health effects of diesel exhaust a complex scientific issue. Some of the chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by the ARB, and are listed as carcinogens either under the State's Proposition 65 or under the federal Hazardous Air Pollutants program. California has adopted a comprehensive diesel risk reduction program. The U.S. EPA has adopted low sulfur diesel fuel standards that will reduce diesel particulate matter substantially. These go into effect in June 2006.

In cooler weather, smoke from residential wood combustion can be a source of TACs. Localized high TAC concentrations can result when cold stagnant air traps smoke near the ground and, with no wind, the pollution can persist for many hours. This occurs in sheltered valleys during the winter. Wood smoke also contains a significant amount of PM_{10} and $PM_{2.5}$. Wood smoke is an irritant and is implicated in worsening asthma and other chronic lung problems.

e. Sensitive Receptors

Sensitive receptors are people who are particularly susceptible to the adverse effects of air pollution. CARB has identified the following people who are most likely to be affected by air pollution: children under 14, the elderly over 65, athletes and people with cardiovascular and chronic respiratory diseases. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, elementary schools and parks. Both State and national ambient air quality standards were developed with the intent to protect sensitive receptors from the adverse impacts of air pollution.

3. Local Programs and Regulations

a. City of Santa Rosa General Plan

The updated Santa Rosa General Plan, adopted in 2002, plans for population growth through 2020. With population growth comes more motor vehicle use, consumer products use and burning of fossil fuels, so air emissions may

increase. Much of the increase is expected to be offset by decreases in emission rates of motor vehicles. However, these increases could lead to more frequent and severe violations of air quality standards. Therefore, the EIR for the General Plan incorporates a wide range of mitigations that can reduce air quality impacts. Mitigations in the General Plan are broad in scope, and the City expects each specific project to implement measures appropriate to the site, scale of activity and other relevant factors. The following lists applicable General Plan goals and policies most pertinent to the Specific Plan.

Goal LUL-A: Foster a compact rather than a scattered development pattern.

- **Policy LUL-A-1:** As part of Plan Implementation - including development review, capital improvements programming and preparation of detailed area plans - foster close land use/transportation relationships to promote use of alternative transportation modes and discourage travel by automobile.

Goal UD-B: Preserve and strengthen downtown as a vital and attractive place.

- **Policy UD-B-2**: Encourage, promote and assist in the development of housing units within downtown for a mix of income levels and housing types, including integrating housing into existing buildings as mixed use.

Goal UD-D: Avoid strip patterns of commercial development. Improve the appearance and functioning of existing commercial strip corridors, such as Santa Rosa Avenue and Sebastopol Road.

- **Policy UD-D-1:** Restructure existing strip developments to cluster commercial uses in neighborhood nodes, with higher density housing included in the mix where possible. Residential, office, or institutional uses that generate less traffic should be located between the nodes.

Goal UD-E: Create a framework of public spaces at the neighborhood, city, and regional scale.

- **Policy UD-E-2:** Provide an open space network that is linked by pedestrian and bicycle paths, and that preserves and enhances Santa Rosa's significant visual and natural resources.

Goal UD-G: Design residential neighborhoods to be safe, human-scaled, and livable.

- **Policy UD-G-2:** Locate higher density residential uses adjacent to transit facilities, shopping and employment centers, and link these areas with bicycle and pedestrian paths.

Goal H-C: Expand the supply of housing available to lower income households.

- **Policy H-C-6:** Promote development of second units. Discuss this option with residential developers during initial development application meetings.

Goal T-A: Provide a safe and sustainable transportation system.

- **Policy T-A-2:** Evaluate corridor levels of service (LOS) and develop strategies to improve service levels.

Goal T-B: Provide a safe, efficient, free-flowing circulation system.

- **Policy T-B-1:** Require site design to focus through-traffic on arterial streets. Promote the following design techniques to increase driver safety and traffic efficiency:
  - Reduce the number of driveways and intersections;
  - Combine driveways to serve numerous small parcels;
  - Avoid residential access;
  - Install street lights;
  - Install and facilitate timing of traffic signals; and
  - Ensure continuous sidewalks.

Goal T-H: Expand the existing transit network to provide convenient and efficient public transportation to workplaces, shopping, and other destinations.

- **Policy T-H-2:** Implement the Long and Short Range Transit, which include CityBus proposals for transit and TSM improvements.
- **Policy T-H-4**: Coordinate transit services and transfers between the various transit operators serving Santa Rosa.

Goal T-I: Support implementation of rail service along the Northwest Pacific Railroad.

- **Policy T-I-2:** Preserve options for future rail stations along the NWPRR corridor by zoning land in proximity to the potential station sites for higher residential densities and/or mixed use development.

Goal T-J: Provide attractive and safe streets for pedestrians and bicyclists.

- **Policy T-J-1:** Pursue implementation of walking and bicycling facilities as envisioned in the City's Updated Bicycle and Pedestrian Master Plan.

Goal T-K: Develop a safe, convenient, and continuous network of pedestrian sidewalks and pathways that link neighborhoods with schools, parks, shopping areas, and employment centers.

- **Policy T-K-1:** Link the various citywide pedestrian paths, including street sidewalks, Downtown walkways, pedestrian areas in shopping centers and work complexes, park pathways and other Creekside and open space pathways.
- **Policy T-K-6:** Integrate multi-use paths into all creek corridors, railroad rights-of-way, and park designs.

Goal T-L: Develop a citywide system of designated bikeways that serves both experienced and casual bicyclists, and which maximizes bicycle use for commuting, recreation and local transportation.

- **Policy T-L-1:** Provide bicycle lanes along all arterial streets and high volume collector streets.

- **Policy T-L-2**: Provide bicycle lanes on major access routes to all schools and parks.
- **Policy T-L-7**: As part of the City's Capital Improvement Program, or street and intersection projects constructed by private developers, install and construct bicycle facilities, including Class I paths, Class II lanes, or Class III route signs, signal detectors, showers, lockers, bicycle parking and/or other facilities.

Goal PSF-A: Provide recreational facilities and parks for all sectors of the community.

- **Policy PSF-A-7:** Acquire park sites adjacent to existing and proposed schools, where possible, and develop these sites as joint use facilities.
- **Policy PSF-A-8:** Integrate the bicycle and pedestrian path networks envisioned in the City's Updated Bicycle and Pedestrian Master Plan with regional park plans, so that users can safely and comfortably access the full range of public open spaces.

Goal PSF-C: Provide superior educational opportunities for children and all members of the community.

- **Policy PSF-C-2**: Maintain good communication with area school districts on all matters pertaining to the need for and the provision of school sites and facilities. Integrate the planning efforts of the City and the school districts by locating school facilities that allow safe pedestrian and bicycle access, as well as ensuring construction of traffic calming measures in the vicinity, and designing attractive facilities that contribute to neighborhood identity and pride.

b. City of Santa Rosa City Code

The Santa Rosa City Council adopted Ordinance No. 3567, regulating the installation of wood burning appliances and operation of non-certified wood heaters in 2002 (City Code, Chapter 17-35, Sec. 17-35.010 et seq.). The ordinance specified the type of wood-burning appliances that may be installed and maintained within the City and bans the use of non-certified wood-burning

appliances after June 1, 2004. This ordinance is intended to reduce PM_{10} emissions from wood burning devices.

B. Existing Conditions

Air quality conditions and pollutant concentrations found in Santa Rosa are a result of pollutant emissions and meteorological conditions. Air pollutant emissions generated in Santa Rosa affect both residents of Santa Rosa and those downwind. Likewise, emissions generated upwind are transported into the City and can affect the city's residents. While short-term changes in air pollutant concentrations are mainly affected by changes in meteorology, long-term trends are primarily affected by rates of emissions.

The following section describes the existing air quality conditions for the City of Santa Rosa.

1. Climate and Topography

Santa Rosa's meteorological conditions are cool and dry in the summers and mild and moderately wet in the winters. Air quality in Santa Rosa is influenced by terrain effects and ocean breezes that travel through the Petaluma and Cotati Valleys. Winds from the south and southwest are most prevalent in Santa Rosa. These are the breezes that travel from the Pacific Ocean to Sonoma County through the Petaluma Gap (roughly between Bodega Bay and Petaluma) and are channeled by the Sonoma Mountains to the east. Sea breezes traveling to Santa Rosa via the Petaluma Gap and the Russian River Valley to the west-northwest provide relatively clean air to Santa Rosa. When the ocean breeze is weak, however, winds from the east can dominate and carry pollutants to Santa Rosa from the Carquinez Strait area. Air quality in Santa Rosa is superior to that of many valley cities in the Bay Area because of the city's location, the terrain and clean ocean breeze.

The climate of Santa Rosa is typical of the Bay Area's interior valleys, tempered by exposure to sea breezes. Summer monthly maximum average tem-

peratures are in the low 80's°F, and winter monthly minimum average temperatures are in the high-30's °F. Santa Rosa receives about 30 inches of annual precipitation with most of it occurring in the winter months.

2. Air Pollution Potential

The clear skies with relatively warm conditions that are typical in summer combine with localized air pollutant emissions to elevate O_3 levels. Air quality standards for O_3 traditionally are exceeded when relatively stagnant conditions occur for periods of several days during the warmer months of the year. Weak wind flow patterns combined with strong inversions substantially reduce normal atmospheric mixing. Key components of ground-level O_3 formation are sunlight and heat; therefore, significant O_3 formation only occurs during the months from late spring through early fall. Air pollution potential in the project area is not as high as other parts of the Bay Area because winds generally do not transport enough of the precursor pollutants into that area (highest concentrations occur at monitoring stations in the eastern and southern portions of the Bay Area that are usually downwind of the major urban areas). However, pollutants emitted in the North Bay area can be transported down-wind and contribute to air quality problems in those problem areas. Light winds that are common in winter combine with strong surface-based inversions caused by cold air trapped near the surface, to trap pollutants such as particulates (e.g. wood smoke) and carbon monoxide. This can lead to localized high concentrations of these pollutants.

3. Air Monitoring Data

The BAAQMD monitors air quality conditions at over 30 locations throughout the Bay Area. The Santa Rosa Monitoring Station is located on Fifth Street. Criteria pollutants monitored include O_3, CO, NO_2, hydrocarbons, PM_{10} and $PM_{2.5}$. The gaseous pollutants (i.e. O_3, CO and NO_2) are monitored continuously while particulate matter (i.e. PM_{10} and $PM_{2.5}$) are sampled for 24 hours every sixth day. A summary of the data recorded at this station is shown in Table 4.2-2 for the period 2000 through 2004 (the complete 2005 data set is not available at the time of this writing).

TABLE 4.2-2 **HIGHEST MEASURED AIR POLLUTANT CONCENTRATIONS**

Pollutant	Average Time	Measured Air Pollutant Levels 2001	2002	2003	2004	2005
Santa Rosa						
O_3	1-Hour	**0.09 ppm**	0.08 ppm	**0.10 ppm**	0.08 ppm	0.07 ppm
	8-Hour	0.06 ppm	0.06 ppm	**0.08 ppm**	0.06 ppm	0.05 ppm
CO	8-Hour	2.4 ppm	2.1 ppm	1.8 ppm	1.6 ppm	2.0 ppm
NO_2	1-Hour	0.06 ppm	0.05 ppm	0.06 ppm	0.05 ppm	0.05 ppm
	Annual	0.013 ppm	0.013 ppm	0.012 ppm	0.011 ppm	0.011 ppm
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	**76 µg/m3**	**51 µg/m3**	**39 µg/m3**	27 µg/m3	34 µg/m3
	Annual	11 µg/m3	11 µg/m3	9 µg/m3	8 µg/m3	8 µg/m3
Respirable Particulate Matter (PM_{10})	24-Hour	**74 µg/m3**	**60 µg/m3**	36 µg/m3	48 µg/m3	39 µg/m3
	Annual	21 µg/m3	18 µg/m3	17 µg/m3	18 µg/m3	16 µg/m3
Bay Area (Basin Summary)						
O_3	1-Hour	**0.13 ppm**	**0.16 ppm**	**0.13 ppm**	**0.11 ppm**	**0.12 ppm**
	8-Hour	**0.10 ppm**	**0.11 ppm**	**0.10 ppm**	**0.08 ppm**	**0.09 ppm**
CO	8-Hour	5.1 ppm	4.5 ppm	4.0 ppm	3.4 ppm	3.1 ppm
NO_2	1-Hour	0.11 ppm	0.08 ppm	0.09 ppm	0.07 ppm	0.07 ppm
	Annual	0.024 ppm	0.019 ppm	0.021 ppm	0.019 ppm	0.019 ppm
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	NA	**77 ug/m3**	**56 ug/m3**	**74 ug/m3**	**55 ug/m3**
	Annual	NA	**14 ug/m3**	11.7 ug/m3	11.6 ug/m3	11.8 ug/m3
Respirable Particulate Matter (PM_{10})	24-Hour	**109 µg/m3**	**80 µg/m3**	**60 µg/m3**	**65 µg/m3**	**81 µg/m3**
	Annual	**29 ug/m3**	**25 ug/m3**	**25 ug/m3**	**26 ug/m3**	**24 ug/m3**

Notes: ppm = parts per million NA = data not available.
Values reported in **bold** for Santa Rosa exceed ambient air quality standard.
Values reported in bold for Bay Area Basin Summary exceed ambient air quality standard.
Source: California Air Resources Board 2006.

Table 4.2-3 shows the number of days per year that air pollutant levels exceeded national or State standards in Santa Rosa and the entire Bay Area monitoring network. No exceedances of the NAAQS for O_3 (1- or 8-hour concentrations) were recorded at this station. Measured concentrations of CO and NO_2 did not exceed the NAAQS or CAAQS. However, measured concentrations of O_3 and PM_{10} exceeded the State standards during the 5-year period. The State standard for O_3 was exceeded on one day in 2003. The State standard for PM_{10} was exceeded on zero to four sampling days annually during the period.

Data from all stations throughout the Bay Area indicate that the national ambient air quality standard for O_3 concentrations (recently revoked) was exceeded on 0 to 2 days annually. The 8-hour national ambient air quality standard for O_3 was exceeded 0 to 7 days annually. The more stringent State O_3 standard was exceeded on 7 to 19 days annually. The State PM_{10} standard was exceeded on 6 to 10 sampling days annually and the $PM_{2.5}$ national standard was exceeded on 0 to 5 days annually.

Air pollutant levels in Santa Rosa are generally lower than those measured throughout the Bay Area. For instance, ozone levels tend to be about 20 percent to 50 percent lower than the highest levels measured in the Air Basin. Only the well ventilated areas in the Central Bay Area (e.g. San Francisco and Oakland) have lower levels. PM_{10} levels in Santa Rosa tend to be similar to those in the rest of the Bay Area with the exception of San Jose, where more exceedances of the State standard are experienced.

4. Current Attainment Status

Areas that do not violate ambient air quality standards are considered to have attained the standard. Violations of ambient air quality standards are based on air pollutant monitoring data and are judged for each air pollutant. The Bay Area as a whole does not meet State or federal ambient air quality standards for ground level O_3 or State standards for fine particulate matter. For O_3, the entire Bay Area is designated non-attainment at both the federal and State levels.

TABLE 4.2-3 **SUMMARY OF MEASURED AIR QUALITY EXCEEDANCES**

Pollutant	Standard	Monitoring Station	Days Exceeding Standard 2001	2002	2003	2004	2005
O_3	NAAQS 1-hr	Santa Rosa	0	0	0	0	--
		BAY AREA	1	2	1	0	--
	NAAQS 8-hr	Santa Rosa	0	0	0	0	0
		BAY AREA	7	7	7	0	1
	CAAQS 1-hr	Santa Rosa	0	0	1	0	0
		BAY AREA	15	16	19	7	9
	CAAQS 8-hr	Santa Rosa	--	--	--	--	0
		BAY AREA	--	--	--	--	9
PM_{10}	NAAQS 24-hr	Santa Rosa	0	0	0	0	0
		BAY AREA	0	0	0	0	0
	CAAQS 24-hr	Santa Rosa	2	2	0	0	0
		BAY AREA	10	6	6	7	6
$PM_{2.5}$	NAAQS 24-hr	Santa Rosa	--	0	0	0	0
		BAY AREA	--	5	0	1	0
All Other (CO, NO_2, Lead, SO_2)	All Other	Santa Rosa	0	0	0	0	0
		BAY AREA	0	0	0	0	0

The BAAQMD along with the other regional agencies (i.e. Association of Bay Area Governments and the Metropolitan Transportation Commission) has prepared an Ozone Attainment Plan to address the NAAQS for O_3. The 2001 Ozone Plan includes a strategy to attain the national ambient air quality standard for O_3. In 2004, EPA made a finding that the Bay Area has attained the national 1-hour ozone standard. However, in 2005, EPA revoked the 1-hour ozone standard, leaving the 8-hour standard as the prevailing national ozone standard. The EPA classified the region as Marginally Non-attainment for the 8-hour O_3 standard. EPA requires the region to adopt a plan that will bring it into attainment with that standard by 2007.

The Bay Area has met the CO standards for over a decade and is classified as at Attainment by the EPA. The EPA grades the region unclassified for all other air pollutants, which include PM_{10} and $PM_{2.5}$. This means that the area likely meets the standard.

At the State level, the Bay Area as a whole is considered Serious Non-attainment for ground level O_3 and Non-attainment for PM_{10} and $PM_{2.5}$. California ambient air quality standards are more stringent than the national ambient air quality standards. The region is required to adopt plans on a triennial basis that show progress towards meeting the State O_3 standard and local air districts (e.g. BAAQMD) are required to make efforts to reduce public exposure to PM_{10} and $PM_{2.5}$. The area is considered Attainment or Unclassified for all other pollutants.

Air quality plans addressing the California Clean Air Act are developed about every three years. The plans are meant to demonstrate progress toward meeting the more stringent 1-hour O_3 CAAQS. The latest plan, which was adopted in January 2006, is called the *Bay Area 2005 Ozone Strategy*. This plan includes a comprehensive strategy to reduce emissions from stationary, area, and mobile sources. The plan objective is to indicate how the region would make progress toward attaining the stricter State air quality standards, as mandated by the California Clean Air Act. The plan is designed to achieve a region-wide reduction of O_3 precursor pollutants through the expeditious implementation of all feasible measures. The plan proposes implementation of transportation control measures (TCMs) and programs such as Spare the Air. Spare the Air is a public outreach program designed to educate the public about air pollution in the Bay Area and promote individual behavior changes that improve air quality. Some of these measures or programs rely on local governments for implementation.

In 2003, the California Legislature enacted Senate Bill 656, to reduce public exposure to PM_{10} and $PM_{2.5}$. SB 656 legislation required BAAQMD to review a list of PM control measures compiled by CARB and identify measures that are most appropriate to the region. BAAQMD reviewed this list and adopted

a PM implementation schedule on November 16, 2005. The BAAQMD staff report along with comments on the report focused mainly on wood smoke issues. Of the 103 measures compiled by CARB, BAAQMD proposed implementing four of the measures. Many of the measures were either similar to measures already adopted by BAAQMD or the benefit of the measure would not be significant. Ten measures that target wood burning were identified for further study. These include rulemaking that could prohibit installation of open fireplaces or wood burning stoves that do not meet current EPA standards. One measure could prohibit wood burning on certain nights. BAAQMD identified additional PM reduction efforts that are being implemented immediately. These include characterizing and controlling wood smoke. BAAQMD plans to enhance monitoring at the neighborhood level and focus more on controlling wood smoke. One measure would include lowering the forecasted air quality index threshold used to make Spare the Air Tonight alerts and step up enforcement when complaints regarding wood smoke are received. SB 656 requires CARB to prepare a report by 2009 that describes actions taken to fulfill the requirements of the legislation as well as recommendations for further actions to assist in achieving the State PM standards.

5. Clean Air Plan Consistency

A key element in air quality planning is to make reasonably accurate projections of future human activities that are related to air pollutant emissions. Most important is vehicle activity. The BAAQMD uses population projections made by the Association of Bay Area Governments and vehicle use trends made by the Metropolitan Transportation Commission to formulate future air pollutant emission inventories. The basis for these projections comes from cities and counties. In order to provide the best plan to reduce air pollution in the Bay Area, accurate projections from local governments are necessary. When General Plans are not consistent with these projections, they cumulatively reduce the effectiveness of air quality planning in the region. The City's General Plan projects a future (post 2020) population that is lower than the projections used for the current clean air plan. Therefore, the City's General Plan is considered consistent with the 2005 Bay Area Ozone

Strategy, which is the most recent clean air plan. Specific plans that increase the amount of vehicle use can conflict with these projections.

6. Transportation Control Measures

The clean air plans have included transportation control measures aimed at reducing air pollution from vehicle use. The effectiveness of these measures are taken into account when projecting future air quality conditions. The Bay Area Clean Air Plan included 20 transportation control measures, which seven require participation at the local level.

7. Buffers

There are no major stationary sources of air toxic contaminants or odor emissions identified in the Specific Plan Area. The largest source of air toxic contaminants would be U.S. 101 traffic. The BAAQMD and CARB recommend that cities include buffers between sensitive receptors and sources of air toxic contaminant emissions and odors. In April 2005, CARB released the final version of the Air Quality and Land Use Handbook, which is intended to encourage local land use agencies to consider the risks from air pollution prior to making decisions that approve the siting of new sensitive receptors near sources of air pollution. Unlike industrial or stationary sources of air pollution, siting of new sensitive receptors does not require air quality permits, but could create air quality problems. The primary purpose of the CARB document is to highlight the potential health impacts associated with proximity to common air pollution sources, so that those issues are considered in the planning process. CARB makes recommendations regarding the siting of new sensitive land uses near freeways, truck distribution centers, dry cleaners, gasoline dispensing stations and other air pollution sources. These "advisory" recommendations are based primarily on modeling information for studies conducted throughout the State and may not be entirely reflective of conditions in Santa Rosa and Sonoma County. Siting of new sensitive land uses within these recommended distances may be appropriate due to site-specific conditions (e.g. source strength or meteorology), but should only be done after site-specific studies are conducted to identify the actual health risks. CARB acknowledges that land use agencies have to balance other siting con-

siderations such as housing and transportation needs, economic development priorities and other quality of life issues. Buffers should be considered with existing and proposed industrial sources to avoid health, odor and nuisance impacts.

C. Standards of Significance

1. BAAQMD's Significance Criteria

To further clarify how the thresholds below are assessed, the significance criteria established by the applicable air quality management district or air pollution control district is relied upon. The following are the significance criteria that the BAAQMD has established to determine project impacts and which are used in this EIR:

a. Consistency with Clean Air Planning Efforts

The *BAAQMD CEQA Guidelines: Assessing the Air Quality Impacts of Projects and Plans (1999)* recommends using an analysis that determines the consistency between the Specific Plan's projected population growth and vehicle miles traveled (VMT) to the projections in the latest Clean Air Plan (CAP). Consistency is also demonstrated by assessing whether the Specific Plan implements all of the applicable CAP transportation control measures, and assess whether the plan provides buffer zones around potential sources of odors, toxics and accidental releases.

A key element in air quality planning is to make reasonably accurate projections of future human activities, particularly vehicle activities that are related to air pollutant emissions. The BAAQMD uses population projections made by ABAG and vehicle use trends made by MTC to formulate future air pollutant emission inventories. These projections are based on land uses information provided by cities and counties. In order to provide the best plan to reduce air pollution in the Bay Area, accurate projections from local governments are necessary. When projects and General Plans are not consistent with these projections, they cumulatively reduce the effectiveness of air qual-

ity planning in the region. The *Bay Area 2005 Ozone Strategy*, which addresses the more stringent State ozone standards, was recently adopted by the BAAQMD. The Specific Plan uses the most recent projections.

b. Construction

The BAAQMD's approach to the CEQA analysis of construction impacts is to emphasize the implementation of effective and comprehensive control measures rather than detailed quantification of emissions. PM_{10} is the pollutant of greatest concern from construction activities. The BAAQMD CEQA Guidelines provide feasible control measures for construction emissions of PM_{10}. If the appropriate construction controls are implemented, air pollutant emissions for construction activities would be considered less than significant.

c. Operations

Specific Plan build-out would cause a significant air quality impact if it were to result in:

- Ozone precursor emissions (ROG and NOx) and PM_{10} emissions from direct and indirect sources (non-typical construction) that exceed the thresholds recommended by the BAAQMD. The BAAQMD recommends a threshold of 80 pounds per day or 15 tons per year for direct and indirect sources of ROG, NOx and PM_{10}.
- Emissions of CO that cause a projected exceedance of the ambient CO State standard of 9.0 ppm for 8-hour averaging period. Additionally, for CO, an increase of 550 pounds per day would be considered significant if it leads to a possible local violation of the CO standards (i.e. if it creates a "hot spot").
- An increase in ROG, NOx, or PM_{10} emissions, of more than 80 pounds per day or 15 tons per year, would also be considered to contribute substantially to the significant cumulative effect.

d. Exposure of New Residences to Toxic Air Contaminants

CARB has identified diesel particulate matter (DPM) as a TAC. Under the BAAQMD CEQA Guidelines, an incremental risk of greater than ten cases

per million at the Maximally Exposed Individual (in the case of the project allowing residences near Highway 101) would result in a significant impact.

e. Odors

Odors are assessed based on the potential of the Specific Plan to result in odor complaints.

2. Project's Standards of Significance

The project would have a significant effect on the environment with respect to air quality if it would:

a. Violate any air quality standard or contribute substantially to an existing or projected air quality violation.

b. Result in a cumulatively considerable net increase of any nonattainment pollutant.

c. Expose sensitive receptors to substantial pollutant concentrations.

d. Create objectionable odors affecting a substantial number of people.

e. Conflict with or obstruct implementation of the applicable air quality plan.

D. Impact Discussion

The following provides an analysis of the effects of the proposed Specific Plan on local and regional air quality.

1. Project Impacts

The following provides a discussion of the Specific Plan Area related impacts that could occur as a result of the Specific Plan.

a. Violate any air quality standard or contribute substantially to an existing or projected air quality violation.

b. Result in a cumulatively considerable net increase of any nonattainment pollutant.

i. Construction Impacts

Buildout of the Specific Plan Area would involve construction activities over 20 years. The numerous small- and medium-sized construction projects that would result from implementation of the Specific Plan could result in different air quality impacts based on their size, duration and proximity to sensitive receptors. The following construction activities would generate pollutant emissions: excavation, grading, construction worker travel to and from project sites, delivery and hauling of construction supplies and debris to and from the project site, and fuel combustion by on-site construction equipment. These construction activities would temporarily create emissions of dusts, fumes, equipment exhaust and other air contaminants. Because the Specific Plan Area includes or is adjacent to a number of sensitive receptors, including residential areas and senior housing, air quality impacts from construction would be significant if not mitigated.

PM_{10} is typically the most significant source of air pollution from construction, particularly during site preparation and grading. PM_{10} emissions from construction can vary daily, depending on the level and type of activity taking place, the equipment being operated, weather conditions and soil conditions. Typically, the BAAQMD does not require quantitative PM_{10} analysis for construction. Instead, the BAAQMD has identified a set of feasible PM_{10} control measures for construction activities. According to the BAAQMD's CEQA Guidelines, if all of these control measures are implemented, a *less-than-significant* impact is expected for PM_{10} emissions.

Another source of construction impacts would be exhaust emissions from construction vehicles. The BAAQMD calculates region-wide construction exhaust emissions of ozone precursor pollutants (NOx and ROG) in air quality planning efforts to attain and maintain ambient air quality standards. Therefore, quantitative analyses of these construction emissions are not recommended by the BAAQMD unless the lead agency believes there would be unusually large or intensive activities. However, the construction of several

Downtown Station Specific Plan projects simultaneously could generate an unusually large amount of construction emissions. Dust generated by construction activities could be considered a *significant* impact.

In addition to ozone precursors, much of the heavy construction equipment utilized to construct these projects would be diesel fueled and therefore generate diesel particulate matter, which is identified by CARB as a Toxic Air Contaminant. Diesel particulate matter is estimated to contribute significantly to the overall potential inhalation cancer risk. Excavation and grading of sites, especially those with underground components, are expected to result in the highest emissions of diesel particulate matter during the construction period. During these periods, diesel exhaust emissions could constitute a potential impact. Because construction activities are temporary, these impacts are not likely to be significant. However, mitigation measures should be required to minimize exposure to sensitive receptors. Dust-related and exhaust emissions during construction periods could result in a *significant* impact.

ii. Operational Emissions

The build-out of the Specific Plan Area would intensify land uses above those already anticipated under the General Plan. This would create new automobile trips, generating emissions of criteria air pollutants, which could affect both regional and local air quality. The traffic study, as discussed in the traffic section of this EIR, predicts an addition of almost 27,000 new daily weekday automobile trips beyond those already included in the General Plan. These additional vehicular trips would exceed BAAQMD thresholds. Although development within the Specific Plan would comply with all the General Plan Policies listed above, which would help reduce this impact, this impact would remain *significant*.

Future changes to air quality resulting from these automobile trips were predicted using computer models. Specific Plan-related emissions were calculated using the URBEMIS2002 model, while predicted CO concentrations were modeled using screening methodologies based on the CALINE4 model. The

methodologies used for these analyses along with modeling output are contained in the Appendix B.

a) Regional Air Quality Impacts

The Specific Plan Area would include a mix of land uses: construction of multi- and single-family residences, hotels, live/work units, offices, a performing arts center, a library, and multi-story mixed use buildings. From an air quality and land use planning perspective, these features may have beneficial impacts to air quality. They would provide housing located near employment centers and Sonoma County transit systems. However, under the BAAQMD's CEQA Guidelines, potential new emissions are compared against established significance thresholds. Emissions of ozone precursor pollutants (ROG and NO_x) and small particulate matter (PM_{10}) can affect air quality throughout the Bay Area.

To evaluate the project effects on regional air quality, emissions of ozone precursor pollutants and PM_{10} were predicted. The URBEMIS2002 Model Version 8.7, obtained from the CARB, was used to predict air pollutant emissions associated with project-related automobile use. This model combines assumptions for automobile activity (e.g. number of trips, vehicle mix, vehicle miles traveled) with vehicle emission factors.

The model was set up to use default inputs for the San Francisco Bay Area along with project type and size, specific trip generation data, and build out year. Model defaults include parameters such as the typical daytime temperature, trip types and lengths, and vehicle mix. Project trip generation data were obtained from W-Trans (see the trip generation portion of the Traffic section). The average daily trip generation includes the reduction for land uses that would be replaced by plan uses or uses that are accounted for in the General Plan. In developing trip generation data, W-Trans included plan features that would reduce vehicle trip generation rates. The features were accounted in the unmitigated URBEMIS2002 modeling as follows:

- Mixture of uses (e.g. retail and residential).
- Proximity to local and regional transit.

- Pedestrian linkages (including attractive sidewalk or pathways) in the Specific Plan Area that connect specific sites to adjacent land uses.
- Bicycle linkages throughout the site (including bike lanes on adjacent roadways).

Emissions from new buildings constructed under the Specific Plan would be associated with "area sources" such as combustion of natural gas used for space and water heating and use of consumer products and landscape equipment. Wood smoke emissions were not considered since the City has a wood smoke ordinance (City Code, Chapter 17-35, Sec. 17-35.010 et seq.) that would reduce emissions to a negligible level.

The plan was modeled to built-out as anticipated market conditions in 2025. Results of the URBEMIS2002 modeling that report changes to emissions of ozone precursor pollutants and PM_{10} are shown in Table 4.2-4. Emissions are shown for both the plan build out and existing or planned uses that would be replaced by the Specific Plan uses.

Net new emissions from development under the Specific Plan area as anticipated market conditions in 2025, is expected to result in direct and indirect emissions of ROG and PM_{10} that would exceed the thresholds established by the BAAQMD. A large portion of the ROG emissions would be the result of projected use of consumer products associated with residential uses. Mobile sources associated with these uses would make up a majority of the new NOx and PM_{10} emissions. Emissions of ROG that exceed the significance thresholds could impact the regions' effort to attain and maintain the ozone ambient air quality standards, since ROG is a precursor pollutant to ozone formation. The project's emissions of PM_{10}, which also would exceed the thresholds for future build-out, may cumulatively contribute to exceedances of the State standard and potential exceedances of the federal and State $PM_{2.5}$ standards. Although development within the Specific Plan Area would comply with all the General Plan Policies mentioned above, which would help reduce this impact, it would still remain a *significant* impact because the increase in

TABLE 4.2-4 **DAILY REGIONAL AIR POLLUTANT EMISSIONS (POUNDS PER DAY) – DRAFT DOWNTOWN SPECIFIC PLAN IN 2025**

Description		Reactive Organic Gases		Nitrogen Oxides		Particulate Matter (PM_{10})
New Sources	Area Sources	222.1	Area Sources	29.0	Area Sources	<0.0
	Mobile Sources	94.5	Mobile Sources	83.2	Mobile Sources	358.2
	Total Sources	316.6	Total Sources	112.2	Total Sources	358.2
Removed Sources	Area Sources	-10.2	Area Sources	-1.6	Area Sources	<0.0
	Mobile Sources	–35.8	Mobile Sources	–31.8	Mobile Sources	-142.7
	Total Sources	-46.0	Total Sources	-35.4	Total Sources	-142.7
Net New Emissions in 2026		**+ 270.6**		+ 76.8		**+ 215.5**
BAAQMD Project Significance Thresholds		80 lbs		80 lbs		80 lbs

* Note: **Bold** indicates emissions exceed significance threshold.

emissions are predicted to be above the significance thresholds established by the BAAQMD.

b) Stationary Sources

Not included on Table 4.2-4 are emissions from any potential permittable on-site stationary source, such as boilers or emergency generators. The exact nature of possible on-site stationary sources cannot be determined at this time; thus, specific air emissions from future occupants of project structures cannot be estimated. However, these types of sources may require construction and operational permits from the BAAQMD, which would include new source review and possible application of Best Available Control Technology (BACT) emission control measures. Since they would need to comply with all applicable BAAQMD regulations, regulated stationary on-site sources are generally not considered to have a significant air quality impact. Stationary sources that are exempt from BAAQMD permit requirements because they fall below emission thresholds for permitting would not be considered to

have a significant air quality impact. For this reason, this impact is considered *less than significant.*

c) Local Air Quality Impacts

Carbon monoxide (CO) emissions from traffic generated by the project would be the pollutant of greatest concern at the local level. Congested intersections with a large volume of traffic have the greatest potential to cause high-localized concentrations of CO. The intersections at College Avenue and Cleveland Avenue, as well as 3rd Street and B Street would experience the combination of highest traffic volumes and worst congestion. CO concentrations were predicted for the six highest volume intersections, and the results are shown in Table 4.2-5. Although there are 1- and 8-hour standards for CO, the 8-hour standard is the most stringent and is always exceeded if the 1-hour standard is exceeded. Therefore, this analysis evaluated impacts against the 8-hour standard.

As shown in Table 4.2-5, modeling that predicted 8-hour CO concentrations with the project are anticipated to be below CCAAQS. Although traffic will increase under cumulative conditions, CO concentrations are anticipated to decrease because vehicles will be cleaner and pollute less. Therefore, the impact of the Specific Plan generated traffic on local air quality is considered to be *less than significant*.

c. Expose sensitive receptors to substantial pollutant concentrations.

The Specific Plan could include new residences, which are considered sensitive receptors adjacent to Highway 101. Unlike industrial or stationary sources of air pollution, siting of new sensitive receptors does not require air quality permits, but could create air quality problems. CARB's *Air Quality and Land Use Handbook* (2005) provides guidance, which is intended to encourage local land use agencies to consider the risks from air pollution prior to making decisions that approve the siting of new sensitive receptors (e.g. homes or daycare centers) near sources of air pollution.

TABLE 4.2-5 **PREDICTED 8-HOUR WORST CASE CARBON MONOXIDE LEVELS (IN PPM)**

Description	2026 Without Plan	2026 With Plan
College Avenue and Dutton Avenue	2.9	3.0
College Avenue and Cleveland Avenue	3.1	3.2
College Avenue and Mendocino Avenue	3.0	3.1
3rd Street and Dutton Avenue	3.0	3.1
3rd Street and B Street	3.1	3.4
Dutton Avenue and Sebastopol Road	2.9	3.0
Significance Thresholds (CAAQS)	9.0 ppm for 8-hour exposure	

* Carbon monoxide emission factors decrease in future years due to improvements in vehicle emission control technology.

i. Background Risk

Since identifying Diesel Particulate Matter (DPM) as a toxic air contaminant, CARB has conducted studies to identify existing health effects from exposure to DPM. The CARB has identified the average year 2000 statewide potential cancer risks due to DPM at 540 excess cases per million people.[1] The potential risk near high volume freeways was found to be much higher. The risk is predicted to decrease in the future due to efforts to reduce DPM emissions from a variety of sources. The 2000 CARB report predicts an average statewide risk at 360 excess cancer cases per million people in 2020. Modeling information compiled by CARB indicates that the cancer health risk from air toxic contaminants in downtown Santa Rosa is between 250 and 500 chances in one million, while the risk in the most urbanized areas of the Bay Area exceeds 1,000 chances per million.

[1] California Air Resources Board 2000.

ii. Analysis of DPM Cancer Risk

This analysis involved the development of future DPM emissions for traffic on Highway 101 using the latest version of the CARB EMFAC2002 emission factor model with defaults for Sonoma County. DPM emissions are anticipated to decrease in the future, while traffic increases. Since this analysis assesses the risk of Specific Plan Area residences to future exposures, the lower future emissions were taken into account. The EMFAC2002 results were then adjusted to the traffic mix on Highway 101 reported by Caltrans (2005). Emission factors were developed for 2010 and 2030, using the calculated mix of diesel-fueled vehicles. Future traffic projections on Highway 101 were included, which indicates that average daily traffic on Highway 101 would increase by about 30 percent over the study period. Emission factors and traffic volumes are not available for years beyond 2030.

Dispersion modeling was conducted using the Cal3qhcr model, which is acceptable to the BAAQMD for this type of analysis. Screening meteorological conditions were used in the modeling. These are conditions that are expected to result in conservative or credible "worst-case" modeled concentrations. Other inputs to the model included geometry (based on aerial photographs), and the DPM emission factors obtained from the EMFAC2002 model. The model predicts one-hour concentrations, which are converted to annual concentrations using a persistence factor of 0.1. Modeled results for 2010, 2020 and 2030 are averaged to develop a 70-year average exposure levels for someone residing at a specific distance near the freeway beginning in 2010. Model inputs and detailed results are provided in the Appendix B.

Modeled concentrations of DPM were used to compute the residential cancer risks, which were computed using the methods recommended by BAAQMD and the California Office of Environmental Health Hazard Assessment (OEHHA). Predicted health risks from exposure to DPM emitted from U.S. 101 traffic are summarized in Table 4.2-6.

Over the course of a 70-year lifetime exposure, the incremental risk of exposure to Specific Plan Area residents was calculated at 10 excess cancer cases per

TABLE 4.2-6 **PREDICTED HEALTH RISK FROM DIESEL PARTICULATE MATTER EMITTED BY U.S. 101 TRAFFIC – SCREENING CALCULATIONS FOR DOWNTOWN SANTA ROSA**

	Distance From Roadway			
Description	**50 Feet**	**100 Feet**	**200 Feet**	**500 Feet**
Health Risk in 2010	**31.6**	**23.9**	**16.9**	**10.0**
Health Risk in 2020	**17.4**	**13.2**	9.3	5.5
Health Risk in 2030	**13.0**	9.8	6.9	4.1
Health Risk Based on 70-Year Average Exposure	**16.3**	**12.3**	8.7	5.1

* Note: **Bold** indicates health risk exceeds BAAQMD significance threshold.

million people or greater for people residing within about 170 feet from the freeway. The DPM concentrations decrease at positions further from the freeway. Specific Plan Area residences sited within 170 feet of the near Highway 101 lanes may be exposed to substantial air pollution levels, due to the predicted health risk. The actual distance would probably be less since the analysis employed screening meteorological conditions that usually result in higher concentrations. U.S. EPA and the CARB have required cleaner engine technologies and diesel fuel reformulation that are reducing the DPM emissions from these vehicles. The effect of these lower emissions rates reduces the area near freeways where significant DPM exposures would occur. For sensitive receptors, such as residential uses, a significant impact is considered a ten in one million chance of contracting cancer where the receptor is exposed to the source almost 24 hours per day for 70 years. The Specific Plan does allow some residential development within 170 feet of the near lanes of Highway 101.

Siting of new residences or sensitive receptors along U.S. 101 within 170 feet of travel lanes could result in a *significant* impact. These findings are based on screening modeling procedures. Specific projects with residences panned

within 170 feet of the highway should undergo further detailed analysis to identify whether the impact is actually significant (i.e. health risk is 10 in one million or greater).

The Specific Plan could include residences near Highway 12; however, this highway has much lower truck volumes than U.S. 101 and would result in lower health risk. Heavy-duty truck traffic is the source of most DPM emitted from roadways. Truck volumes on Highway 12 are about 25 percent of those on U.S. 101. The health risk from Highway 12 would be about 25 percent of the risk from U.S. 101. Therefore, the health risk along Highway 12 would be less than 50 feet from the highway travel lanes, where residential or siting of sensitive receptors would not occur.

d. Create objectionable odors affecting a substantial number of people.

The implementation of the Downtown Station Area Specific Plan would result in the development of a mix of residential, retail, restaurant and office uses similar in type to the existing development in downtown Santa Rosa and in typical urban downtowns. The Downtown Station Area Specific Plan does not include any specific uses that would create objectionable odors, so no impacts are expected to occur beyond those that would be occur under the General Plan. Thus, the Specific Plan would result in a *less-than-significant* impact.

e. Conflict with or obstruct implementation of the applicable air quality plan.

A key element in air quality planning is to make reasonably accurate projections of future human activities, particularly vehicle activities that are related to air pollutant emissions. The BAAQMD uses population projections made by the Association of Bay Area Governments and vehicle use trends made by the Metropolitan Transportation Commission to formulate future air pollutant emission inventories. These projections are based on estimates from cities and counties. In order to provide the best plan to reduce air pollution in the Bay Area, accurate projections from local governments are necessary. When

General Plans are not consistent with these projections, they cumulatively reduce the effectiveness of air quality planning in the region.

The Downtown Station Area Specific Plan would result in an amount and intensity of growth in the Specific Plan Area that is more intense than foreseen in the current Santa Rosa General Plan for that area. The plan would produce approximately 27,000 more trips than would occur under the General Plan. The impacts from growth associated with development within the Specific Plan Area are identified under the discussion of *Regional Air Quality Impacts*. However, this growth is not expected to conflict with regional air quality planning efforts since growth within Santa Rosa would remain below ABAG projections.

All development within Santa Rosa, including development within the Specific Plan Area would be subject to the City's Growth Management Plan (General Plan Policy GM-B-1 sets a limits for the number of new housing units that could be constructed in Santa Rosa). With the limits and growth plan in place, Santa Rosa's population is projected to be less than ABAG projections in 2020. VMT associated with this project is anticipated to grow at a lower rate than growth associated with traditional development within Santa Rosa since the Specific Plan development would include a complimentary mix of uses and be oriented towards transit uses. The Specific Plan would increase residential development in an area served by transit and a mix of different land uses that serve each other. This type of development supports smart growth, which in turn results in lower rate of vehicle miles traveled. Smart growth is a term used by ABAG and MTC to describe development that reflects higher densities, mixed use and a higher proportion of housing and employment growth in urban areas, particularly near transit stations and along transit corridors, as well as in town centers. The higher emissions of ozone precursor pollutants would be consistent with predictions contained in the adopted Clean Air Plan (i.e. *2005 Bay Area Ozone Strategy*), and would result in a *less-than-significant* impact.

2. Cumulative Impacts

Cumulative air quality impacts were evaluated based on both a quantification of the plan-related air quality impacts and the consistency of the Specific Plan Area with projections used for local and regional air quality plans (i.e. the Santa Rosa General Plan and the Bay Area 2005 Ozone Strategy). Cumulative air quality impacts are considered as a part of the plan-level analysis discussed above since future traffic projections used for the air quality analysis were generated by a cumulative traffic model. As shown in Table 4.2-4, ozone precursor (i.e. ROG) and PM_{10} emissions resulting from build out of the plan are predicted to be above the significance thresholds established by the BAAQMD, and may impact the regions' effort to attain and maintain the ozone ambient air quality standards. Development within the Specific Plan would comply with all of the General Plan Policies mentioned above, which would help reduce the impact. The impact could still contribute to a *cumulatively significant* (see Impact AQ-2) net increase of criteria pollutants for which the region is non-attainment under an applicable federal or State ambient air quality standard.

E. Impacts and Mitigation Measures

Impact AQ-1: Construction activity during development within the Specific Plan area would generate air pollutant emissions that could expose sensitive receptors to substantial pollutant concentrations. This is a *significant* impact.

Mitigation Measure AQ-1: Implement control measures for construction and demolition-related air emissions to ensure that each project sponsor and contractor reduces particulate, ROG, and NO_x emissions by complying with the BAAQMD policies and guidelines. Each project sponsor and contractor shall implement the following control measures:

- Provide transit information kiosks.
- Cover all trucks hauling construction and demolition debris from the site.

- Water on a continuous as-needed basis all earth surfaces during clearing, grading, earthmoving, and other site preparation activities.
- Use watering to control dust generation during demolition of structures or break-up of pavement.
- Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved parking areas and staging areas.
- Sweep daily (with water sweepers) all paved areas and staging areas.
- Provide daily clean up of mud and dirt carried onto paved streets from the site.
- Renovation, demolition activities, removal or disturbances of any material that contain asbestos, lead paint or other hazardous pollutants will be conducted in accordance with BAAQMD rules and regulations.
- Properly maintain all construction equipment.
- Reduce equipment idling time.

For construction near sensitive receptors:

- Install wheel washers for all exiting trucks, or wash off the tires or tracks of trucks and equipment leaving the site.
- Suspend dust-producing activities during periods when instantaneous gusts exceed 25 mph when dust control measures are unable to avoid visible plumes.
- Limit the area subject to excavation, grading and other construction or demolition activity at any one time.

For sites greater than 4 acres:

- Apply soil stabilizers to previously graded portions of the site inactive for more than ten days, or cover or seed these areas.
- Water or cover stockpiles of debris, soil, sand, or other materials that can be blown by the wind.
- Limit traffic speeds on unpaved roads to 15 mph.

- Replant vegetation in disturbed areas as quickly as possible.

Significance After Mitigation: Less than significant.

Impact AQ-2: The Downtown Station Area Specific Plan would contribute to increased vehicular and residential area emissions that would exceed BAAQMD thresholds. This is a *significant* impact.

Mitigation Measure AQ-2: Developers shall implement emissions control measures, where applicable, to development activities within the Specific Plan Area in order to reduce overall emissions from traffic and area sources. The emissions control measures could include the following:

- Where practical, future development proposals shall include physical improvements, such as sidewalk improvements, landscaping and the installation of bus shelters and bicycle parking, that would act as incentives for pedestrian, bicycle and transit modes of travel.
- New or modified roadways should include bicycle lanes where reasonable and feasible.
- Provide transit information kiosks.
- Where practical, employment-intensive development proposals (i.e. office and retail) shall include measures to encourage use of public transit, ridesharing, van pooling, use of bicycles, and walking, as well as to minimize single passenger motor vehicle use.
- Offices or retail uses that have 50 or more employees and provide parking should implement a parking cash-out program (where non-driving employees receive transportation allowance equivalent to the value of subsidized parking).
- Develop parking enforcement and fee strategies that encourage alternative modes of transportation.
- Parking lots or facilities should provide preferential parking for electric or alternatively fueled vehicles.

- Require energy efficient building designs that exceed State Title 24 building code requirements.
- Discourage use of gasoline-powered landscape equipment.
- Implement and enforce truck idling restrictions of three minutes.
- Only allow low-emitting fireplaces for residential uses, such as those that only burn natural gas.

Significance After Mitigation: Significant and Unavoidable.

Impact AQ-3: The development of new residences within the Specific Plan area could expose sensitive receptors to unhealthy levels of TACs emitted by traffic on Highway 101. This would be a *significant* impact.

Mitigation Measure AQ-3**:** Buffers for emission sources and sensitive land uses shall be required for residential uses proposed within 170 feet of the freeway and shall undergo detailed analysis to identify site specific health risks associated with DPM emitted from Highway 101. These buffers shall provide appropriate buffers between potential air pollution and odor impacts from land uses that may emit pollution and/or odors when locating (a) air pollution sources, and (b) residential and other pollution-sensitive land users in the vicinity of air pollution sources which may include freeways, gasoline fueling stations and dry cleaning operations that use solvents.

Significance After Mitigation: Less than significant.

Impact AQ-4: Siting of new residences or sensitive receptors along Highway 101 within 170 feet of travel lanes could result in a *significant* impact.

Mitigation Measure AQ-4: Implementation of buffers for emission sources and sensitive land uses shall be required for the Specific Plan.

Significance After Mitigation: Less than significant.