5.1 Air Quality

The CPV Vaca Station (CPVVS) will be a 660-megawatt (MW), combined-cycle power generation facility consisting of either two General Electric (GE) Energy Frame 7FA or Siemens SGT6 5000F natural gas-fired combustion turbine generators (CTGs) and associated equipment. The facility will be located in Vacaville, Solano County, California, on a 24-acre parcel. The project site, currently occupied by a fallow agricultural field, is located on property owned by the City of Vacaville (City). Surrounding land uses include the City's Easterly Wastewater Treatment Plant (EWTP) to the northwest and agricultural land uses to the east, west, and south.

This section describes existing air quality conditions, maximum potential impacts from the project, and mitigation measures that will keep these impacts below thresholds of significance. The project will use the latest, most efficient generation technology to generate electricity in a manner that will minimize the amount of fuel needed, emissions of criteria pollutants, and potential effects on ambient air quality.

The project will also include the following beneficial environmental aspects that will minimize adverse air quality:

- Clean-burning natural gas as fuel
- Dry low-NO_x combustors and selective catalytic reduction (SCR) to minimize NO_x emissions
- Oxidation catalysts to reduce emissions of carbon monoxide, volatile organic compounds and hazardous air pollutants
- Appropriately sized stacks to reduce ground-level concentrations of exhaust constituents

This section presents the methodology and results of the air quality analyses performed to assess potential impacts associated with air emissions from the project. Potential public health risks posed by emissions of non-criteria pollutants are addressed in Section 5.9, Public Health.

Section 5.1.1 presents the existing site conditions, including geography, topography, climate and meteorology. Section 5.1.2 provides an overview of air quality standards and health effects. Section 5.1.3 discusses the criteria pollutants and existing air quality in the vicinity of the proposed project. Section 5.1.4 presents an analysis of the affected environment. Section 5.1.5 presents cumulative effects. Mitigation measures for projected air quality impacts are discussed in Section 5.1.6. Section 5.1.7 discusses compliance with LORS applicable to the project. Section 5.1.8 lists agency contacts for air quality issues. Section 5.1.9 provides permit information. Section 5.1.9 provides the references used to prepare the section.

5.1.1 Existing Site Conditions

5.1.1.1 Geography and Topography

The project will be located on the east side of Vacaville, immediately southeast the EWTP. The project site is currently occupied by a fallow agricultural field, and is bounded by agricultural land uses to the east, west, and south. The nearest residence is a farmhouse approximately 800 feet from the project site.

Vacaville is in the Yolo-Solano Air Quality Management District (YSAQMD). YSAQMD is located within the boundaries of the Sacramento Valley Air Basin (SVAB). The SVAB encompasses 11 counties including all of Shasta, Tehama, Glenn, Colusa, Butte, Sutter, Yuba, Sacramento, and Yolo Counties; the westernmost portion of Placer County; and the northeastern half of Solano County. The SVAB is bounded by the North Coast Ranges on the west and Northern Sierra Nevada Mountains on the east. The intervening terrain is relatively flat.

5.1.1.2 Climate and Meteorology

Hot dry summers and mild rainy winters characterize the Mediterranean climate of the SVAB. During the year, the temperature may range from 20 to 115 degrees Fahrenheit (°F), with summer highs usually in the 90s and winter lows occasionally below freezing. Average annual rainfall is about 20 inches, and the rainy season generally occurs from November through March. The prevailing winds are moderate in strength and vary from moist clean breezes from the south to dry land flows from the north.[1]

The mountains surrounding the SVAB create a barrier to airflow, which can trap air pollutants under certain meteorological conditions. The highest frequency of air stagnation occurs in the autumn and early winter when large high-pressure cells collect over the Sacramento Valley. The lack of surface wind during these periods and the reduced vertical flow caused by less surface heating reduces the influx of outside air and allows air pollutants to become concentrated in a stable volume of air. The surface concentrations of pollutants are highest when these conditions are combined with temperature inversions that trap pollutants near the ground.

The ozone season (May through October) in the Sacramento Valley is characterized by stagnant morning air or light winds with the delta sea breeze arriving in the afternoon out of the southwest. Usually the evening breeze transports the airborne pollutants to the north out of the Sacramento Valley. During about half of the days from July to September, however, a phenomenon called the "Schultz" eddy prevents this from occurring. Instead of allowing for the prevailing wind patterns to move north carrying the pollutants out, the Schultz eddy causes the wind pattern to circle back to the south. Essentially, this phenomenon causes the air pollutants to be blown south toward YSAQMD. This has the effect of exacerbating the pollution levels in the area and increases the likelihood of violating federal or state standards. The eddy normally dissipates around noon when the delta sea breeze arrives.

Air quality is determined primarily by the type and amount of pollutants emitted into the atmosphere, the topography of the air basin, and local meteorological conditions. In the project area, stable atmospheric conditions and light winds can provide conditions for

[1] YSAQMD Handbook for Assessing and Mitigating Air Quality Impacts, July 11, 2007

pollutants to accumulate in the air basin when emissions are produced. The predominant winds in California are shown in Figures 5.1-1 through 5.1-4. As indicated in the figures, winds in California generally are light and easterly in the winter, but strong and westerly in the spring, summer, and fall.

Wind patterns at the project site which show quarterly and annual wind roses for meteorological data collected at the Travis AFB in Fairfield during the period from 2003 through 2007 are provided in Appendix 5.1. Wind frequency distribution tables are also provided in Appendix 5.1.

The mixing heights of the area are affected by the eastern Pacific high pressure system and marine influences. Often, the base of the inversion is found at the top of a layer of marine air because of the cooler nature of the marine environment. Smith et al. (1984) reported that at Oakland, the nearest upper-level meteorological station (located approximately 40 miles south-southwest of the project site), 50th percentile morning mixing heights for the period 1979 to 1980 were on the order of 1,770 feet (530 to 550 meters) in summer and fall, and 3,600 to 3,900 feet (1,100 to 1,200 meters) in winter and spring. The 50th percentile afternoon mixing heights ranged from 2,150 and 3,030 feet (660 to 925 meters) in summer and fall, and over 3,900 feet (over 1,200 meters) in winter and spring. Such mixing heights provide generally favorable conditions for the dispersion of pollutants. Inland areas, where the marine influence is weaker, often experience strong ground-based inversions during cold weather periods. These inversions inhibit dispersion of low-lying sources of air pollution, such as cars, trucks and buses, and can result in high pollutant concentrations.

5.1.2 Overview of Air Quality Standards

The U.S. Environmental Protection Agency (EPA) has established national ambient air quality standards (NAAQS) for ozone, nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter with aerodynamic diameter less than or equal to 10 microns (PM_{10}), particulate matter with aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$), and airborne lead. Areas with air pollution levels above these standards are considered "nonattainment areas" subject to planning and pollution control requirements that are more stringent than standard requirements.

In addition, the California Air Resources Board (CARB) has established standards for ozone, CO, NO_2, SO_2, sulfates, PM_{10}, airborne lead, hydrogen sulfide, and vinyl chloride at levels designed to protect the most sensitive members of the population, particularly children, the elderly, and people who suffer from lung or heart diseases.

Both state and national air quality standards consist of two parts: an allowable concentration of a pollutant, and an averaging time over which the concentration is to be measured. Allowable concentrations are based on the results of studies of the effects of the pollutants on human health, crops and vegetation, and, in some cases, damage to paint and other materials. The averaging times are based on whether the damage caused by the pollutant is more likely to occur during exposures to a high concentration for a short time (1 hour, for instance), or to a relatively lower average concentration over a longer period (8 hours, 24 hours, or 1 month). For some pollutants there is more than one air quality standard, reflecting both short-term and long-term effects. Table 5.1-1 presents the NAAQS and California ambient air quality standards for selected pollutants. The California standards are generally set at concentrations much lower than the federal standards and, in some cases, have shorter averaging periods.

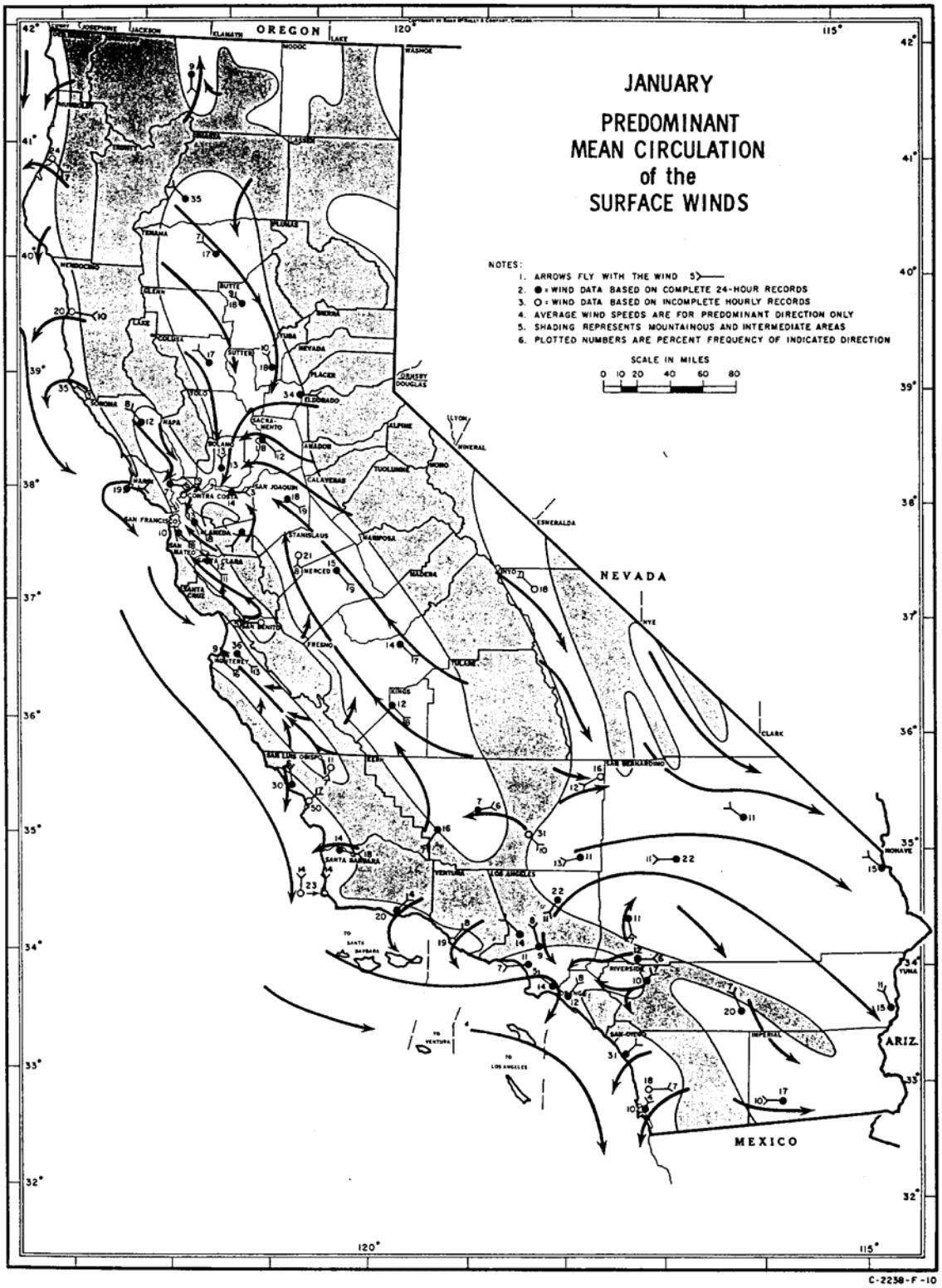

FIGURE 5.1-1
January Predominant Mean Circulation of the Surface Winds

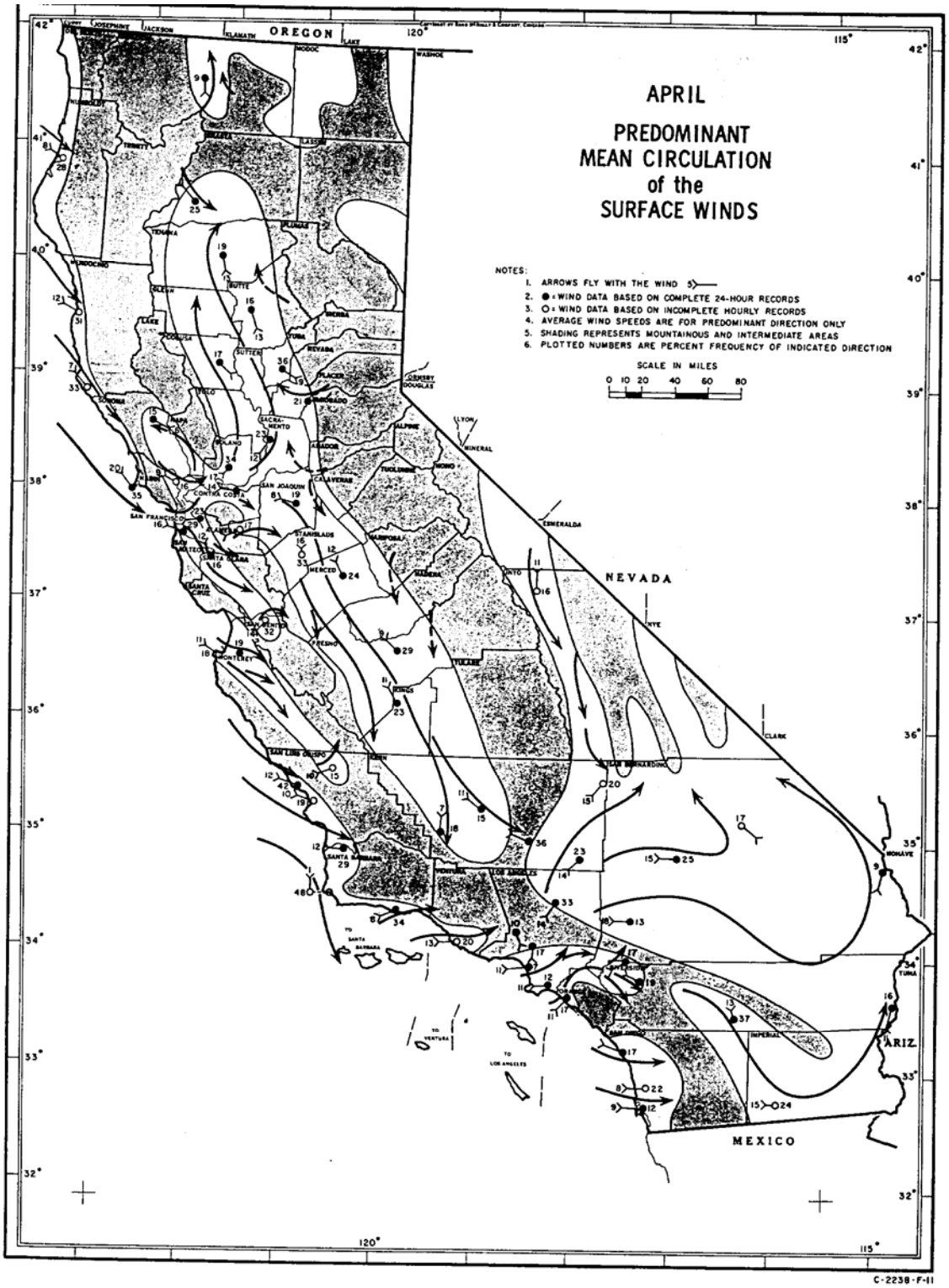

FIGURE 5.1-2
April Predominant Mean Circulation of the Surface Winds

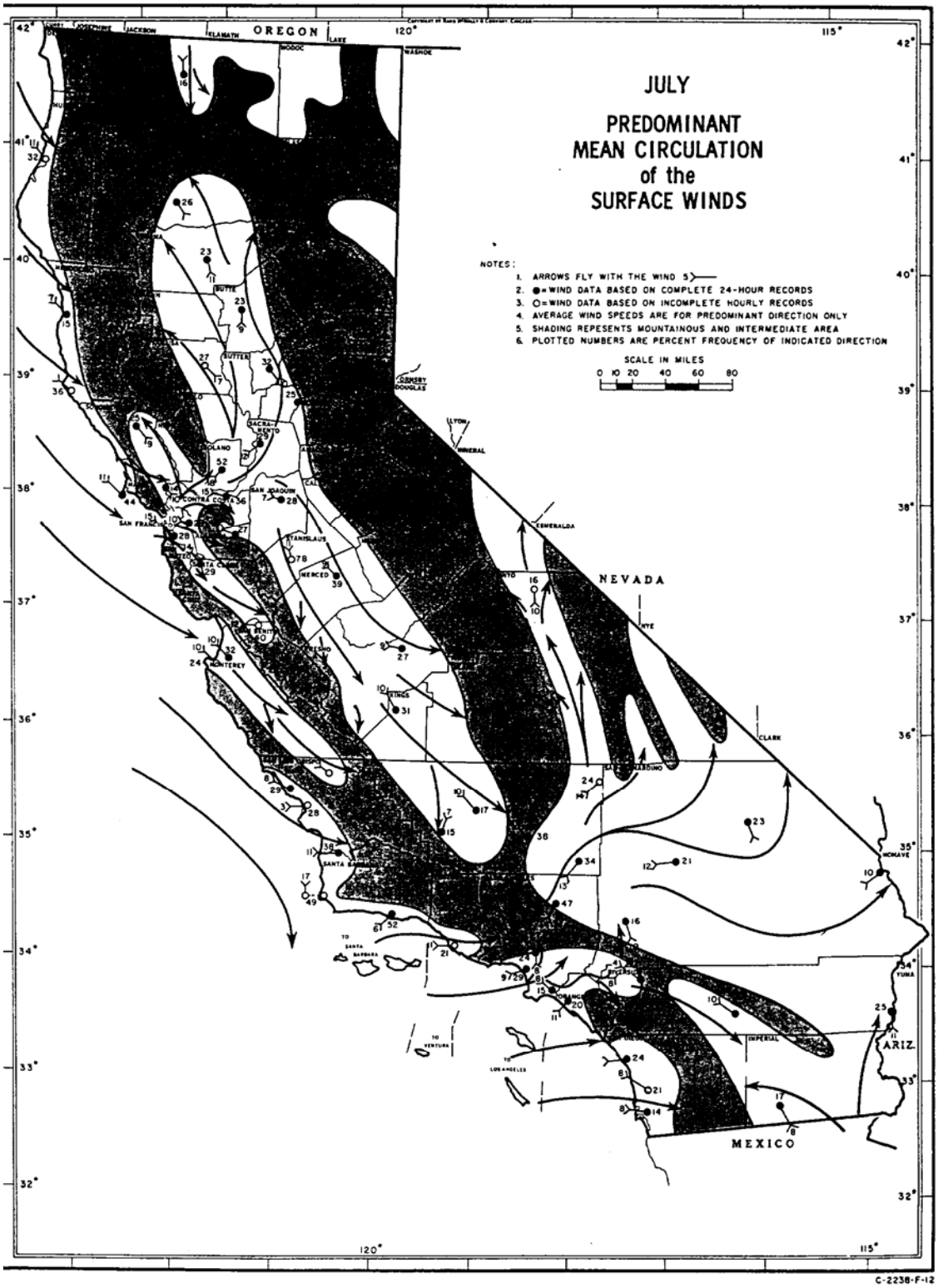

FIGURE 5.1-3
July Predominant Mean Circulation of the Surface Winds

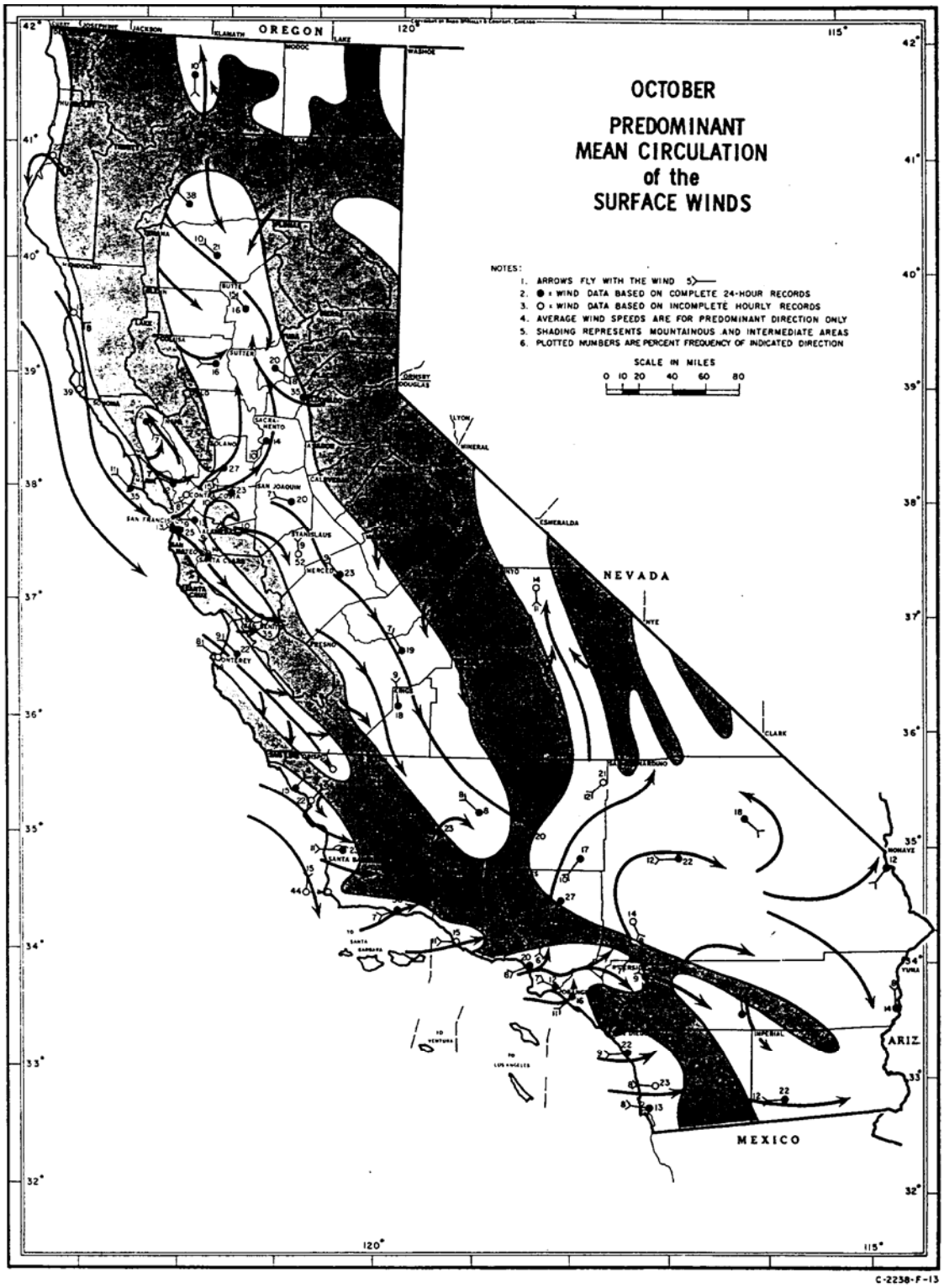

FIGURE 5.1-4
October Predominant Mean Circulation of the Surface Winds

TABLE 5.1-1
Ambient Air Quality Standards

Pollutant	Averaging Time	California	National
Ozone	1 hour	0.09 ppm (180 μg/m^3)	
	8 hours	0.070 ppm (137 μg/m^3)	0.075 ppm (147 μg/m^3) (3-year average of annual 4th-highest daily maximum)
Carbon Monoxide	8 hours	9.0 ppm (10,000 μg/m^3)	9 ppm (10,000 μg/m^3)
	1 hour	20 ppm (23,000 μg/m^3)	35 ppm (40,000 μg/m^3)
Nitrogen Dioxide	Annual Average	0.030 (57 μg/m^3)	0.053 ppm (100 μg/m^3)
	1 hour	0.18 ppm (339 μg/m^3)	–
Sulfur Dioxide	Annual Average	–	0.03 ppm (80 μg/m^3)
	24 hours	0.04 ppm (105 μg/m^3)	0.14 ppm (365 μg/m^3)
	3 hours*	–	0.5 ppm (1300 μg/m^3)
	1 hour	0.25 ppm (655 μg/m^3)	–
Suspended Particulate Matter (10 Micron)	Annual Arithmetic Mean	20 μg/m^3	–
	24 hours	50 μg/m^3	150 μg/m^3
Suspended Particulate Matter (2.5 Micron)	Annual Arithmetic Mean	12 μg/m^3	15 μg/m^3 (3-year average)
	24 hours	–	35 μg/m^3 (3-year average of 98th percentiles)
Sulfates	24 hours	25 μg/m^3	–
Lead	30 days	1.5 μg/m^3	–
	Calendar Quarter	–	1.5 μg/m^3
Hydrogen Sulfide	1-hour	0.03 ppm (42 μg/m^3)	–
Vinyl Chloride	24-hour	0.010 ppm (26 μg/m^3)	–
Visibility Reducing Particles	8-hour (10AM to 6PM PST)	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent.	–

*This is a national secondary standard, which is designed to protect public welfare.

μg/m^3 = micrograms per cubic meter
ppm = parts per million

5.1.3 Existing Air Quality

The project will be located near Vacaville, California, in a portion of Solano County that is included in the SVAB. To characterize existing air quality at the project site, ambient air quality readings were taken from nearby air monitoring stations. Ambient concentrations of ozone were taken from the Ulatis Drive monitoring station in Vacaville, approximately 3 miles west of the project site. Data for 1998 through 2002 were taken from the Vacaville Elmira Road Station, approximately 4.5 miles west of the project site, because ozone data were not available from the Ulatis Drive station during those years. Ambient concentrations of PM_{10} were taken from the Merchant Street monitoring station in Vacaville; $PM_{2.5}$, NO_2, and CO are monitored in Davis, about 15 miles northeast of the CPVVS site. The nearest SO_2 monitoring station is in Vallejo. Ambient lead data appear to be no longer available for northern California. These stations were used because of their proximity to the project site and because they record area-wide ambient conditions rather than the localized impacts of any particular facility.[2] All ambient air quality data presented in this section were taken from CARB and EPA publications and data sources.

5.1.3.1 Ozone

Ozone is generated by a complex series of chemical reactions between reactive organic compounds (ROC) and NO_x in the presence of ultraviolet radiation. Ambient ozone concentrations follow a seasonal pattern: higher in the summertime and lower in the wintertime. At certain times, the general area can provide ideal conditions for the formation of ozone due to the persistent temperature inversions, clear skies, mountain ranges that trap the air mass, and exhaust emissions from millions of vehicles and stationary sources. For purposes of state and federal air quality planning, the SVAB is a serious nonattainment area for 8-hour averaging period ozone.

Maximum ozone concentrations at the Vacaville stations usually are recorded during the summer months. Table 5.1-2 shows the annual maximum hourly ozone levels recorded at the Elmira Road and Ulatis Drive monitoring stations during the period from 1998 through 2007, as well as the number of days in which the state and federal standards were exceeded. The data show that at the end of the 1990s, the number of days in excess of state ozone air quality standard dropped from nine per year to one or two. No particular trend is evident in ozone maxima since 2000.

The long-term trends of maximum 1-hour ozone readings and violations of the state and federal standard are shown in Figure 5.1-5 for the Vacaville monitoring stations. The figures indicate that maximum hourly ozone concentrations reach a level about 20 percent above the state standard of 0.070 ppm. The downward trends of maximum and 3-year averages of the 4th highest daily concentrations of 8-hour average ozone readings and exceedances of the federal standard are shown in Figure 5.1-6. YSAQMD is not yet in attainment of the state and federal ozone air quality standards.

[2] A more extensive discussion of why the data from these stations are considered to be representative of air quality in the vicinity of the proposed project is provided in Section 5.1.5.4.1.

TABLE 5.1-2
Ozone Levels in Vacaville, Elmira Road Monitoring Station, 1998-2002 and Ulatis Drive, 2003-2007 (ppm)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Highest 1-Hour Average	0.137	0.139	0.100	0.104	0.100	0.094	0.101	0.101	0.108	0.103
Highest 8-Hour Average	0.102	0.106	0.081	0.081	0.077	0.081	0.087	0.080	0.088	0.078
3-year Arithmetic Mean of 4th Highest 8-hour average	*	*	*	*	*	*	*	*	0.073	0.060
Number of Days Exceeding:										
State Standard (0.09 ppm, 1-hour)	10	8	2	2	1	0	1	1	4	1
State Standard (0.070 ppm, 8-hour)	28	22	5	5	6	5	3	5	10	4
Federal Standard (0.075 ppm, 8-hour)	7	8	0	0	0	0	1	0	2	0

* Insufficient data

Source: California Air Quality Data, CARB website; EPA AIRData website. 1998-2002 values come from the Vacaville Elmira Road Station: 2003-2007 values come from the Vacaville Ulatis Drive Station.

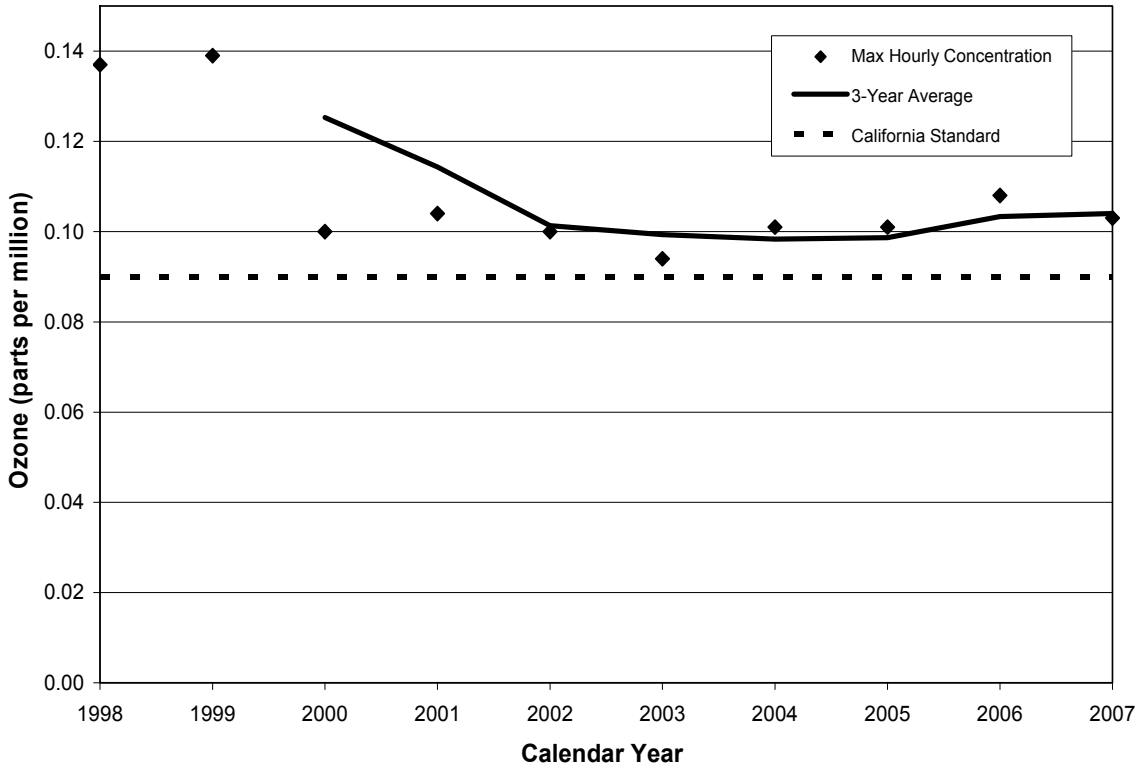

FIGURE 5.1-5
Maximum Hourly Ozone Levels
Vacaville, 1998-2007

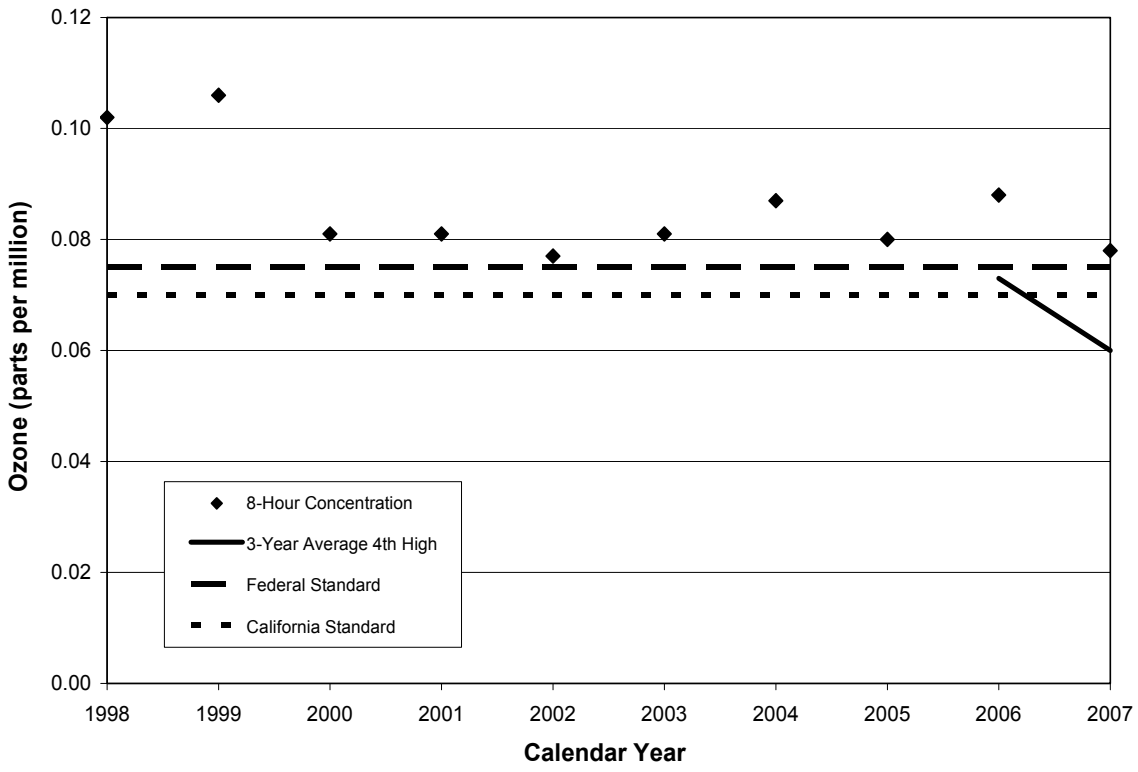

FIGURE 5.1-6
Maximum 8-Hour Average Ozone Levels
Vacaville, 1998-2007

5.1.3.2 Nitrogen Dioxide

Atmospheric NO_2 is formed primarily from reactions between nitric oxide (NO) and oxygen or ozone. NO is formed during high temperature combustion processes, when the nitrogen and oxygen in the combustion air combine. Although NO is much less harmful than NO_2, it can be converted to NO_2 in the atmosphere within a matter of hours, or even minutes, under certain conditions. For purposes of state and federal air quality planning, the SVAB is in attainment for NO_2.

Table 5.1-3 shows the long-term trend of maximum 1-hour NO_2 levels recorded at the Davis-UCD Campus between 1998 and 2007, as well as the annual average level for each of those years. During this period, there has not been a single violation of either the state 1-hour standard of 0.18 ppm, the state annual average standard of 0.030 ppm, or the NAAQS of 0.053 ppm (annual average).

Figure 5.1-7 shows the slightly downward historical trend of maximum 1-hour NO_2 levels at UC Davis. The NO_2 levels are less than one-half of the state standard.

TABLE 5.1-3
Nitrogen Dioxide Levels at Davis-UCD Campus, 1998-2007, (ppm)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Highest 1-Hour Average	0.060	0.073	0.053	0.172	0.059	0.060	0.057	0.043	0.045	0.046
Annual Average (State standard = 0.030 ppm) (NAAQS = 0.053 ppm)	0.011	0.012	0.011	0.010	0.012	0.011	0.009	0.009	0.009	0.008
Number of Days Exceeding:										
State Standard (0.18 ppm, 1-hour)	0	0	0	0	0	0	0	0	0	0

Source: California Air Quality Data, CARB website; EPA AIRData website.

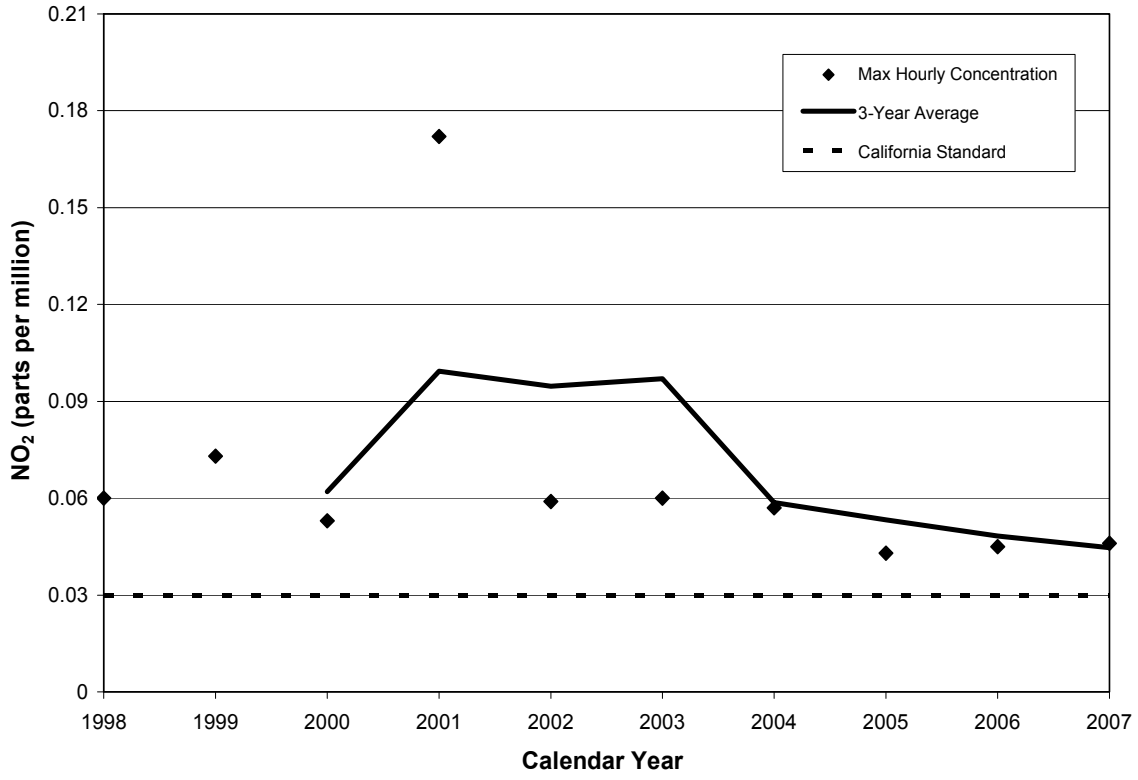

FIGURE 5.1-7
Maximum Hourly NO_2 Levels
Davis, 1998-2007

5.1.3.3 Carbon Monoxide

CO is a product of inefficient combustion, principally from automobiles and other mobile sources of pollution. In many areas of California, CO emissions from wood-burning stoves and fireplaces can also be measurable contributors to ambient CO levels. Industrial sources typically contribute less than 10 percent of ambient CO levels. Peak CO levels occur typically during winter months, due to a combination of higher emission rates and calm

weather conditions with strong, ground-based inversions. Based on ambient air quality monitoring, the SVAB is classified as being in attainment for CO.

Table 5.1-4 shows the California and federal air quality standards for CO, and the maximum 1- and 8-hour average levels recorded at the Davis-UCD Campus during the period from 1997 through 2006 (data for 2007 are not yet available).

TABLE 5.1-4
Carbon Monoxide Levels Davis-UCD Campus Monitoring Station, 1997-2006 (ppm)*

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Highest 1-hour average	2.8	2.5	2.4	2.5	15.1	1.9	3.3	1.6	0.9	0.9
Highest 8-hour average	1.77	1.14	1.37	1.25	2.50	1.44	0.83	0.98	0.69	0.56
Number of days exceeding:										
State Standard (20 ppm, 1-hr)	0	0	0	0	0	0	0	0	0	0
State Standard (9.0 ppm, 8-hr)	0	0	0	0	0	0	0	0	0	0
Federal Standard (35 ppm, 1-hr)	0	0	0	0	0	0	0	0	0	0
Federal Standard (9.3 ppm, 8-hr)	0	0	0	0	0	0	0	0	0	0

*2007 data unavailable

Source: California Air Quality Data, CARB website; EPA AIRData website.

Trends of maximum 1- and 8-hour average CO concentrations are shown in Figures 5.1-8 and 5.1-9, which show that maximum ambient CO levels at UC Davis have been well below the state standards for many years.

5.1.3.4 Sulfur Dioxide

SO_2 is produced when any sulfur-containing fuel is burned. It is also emitted by chemical plants that treat or refine sulfur or sulfur-containing chemicals. Natural gas contains negligible sulfur, while fuel oils contain larger amounts. Peak concentrations of SO_2 occur at different times of the year in different parts of California, depending on local fuel characteristics, weather, and topography. The SVAB is considered to be in attainment for SO_2 for purposes of state and federal air quality planning.

Table 5.1-5 presents the state air quality standard for SO_2 and the maximum levels recorded in Vallejo during the period from 1998 through 2007. The federal annual average standard is 0.03 ppm; during the period shown, the annual average SO_2 levels have been well under the federal standard. Figure 5.1-10 shows that for several years the maximum 24-hour SO_2 levels typically have been less than approximately one-fifth of the state standard of 0.04 ppm. The federal 24-hour average standard is 0.14 ppm.

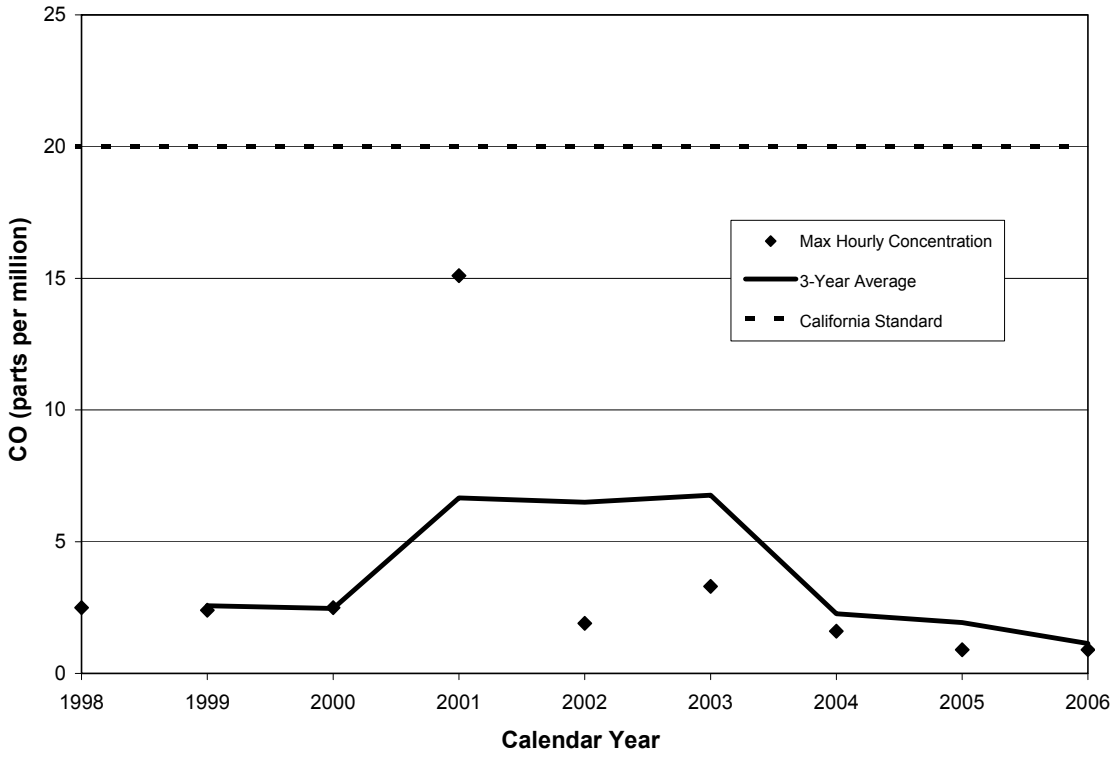

FIGURE 5.1-8
Maximum 1-Hour Average CO Levels
Davis, 1997-2006

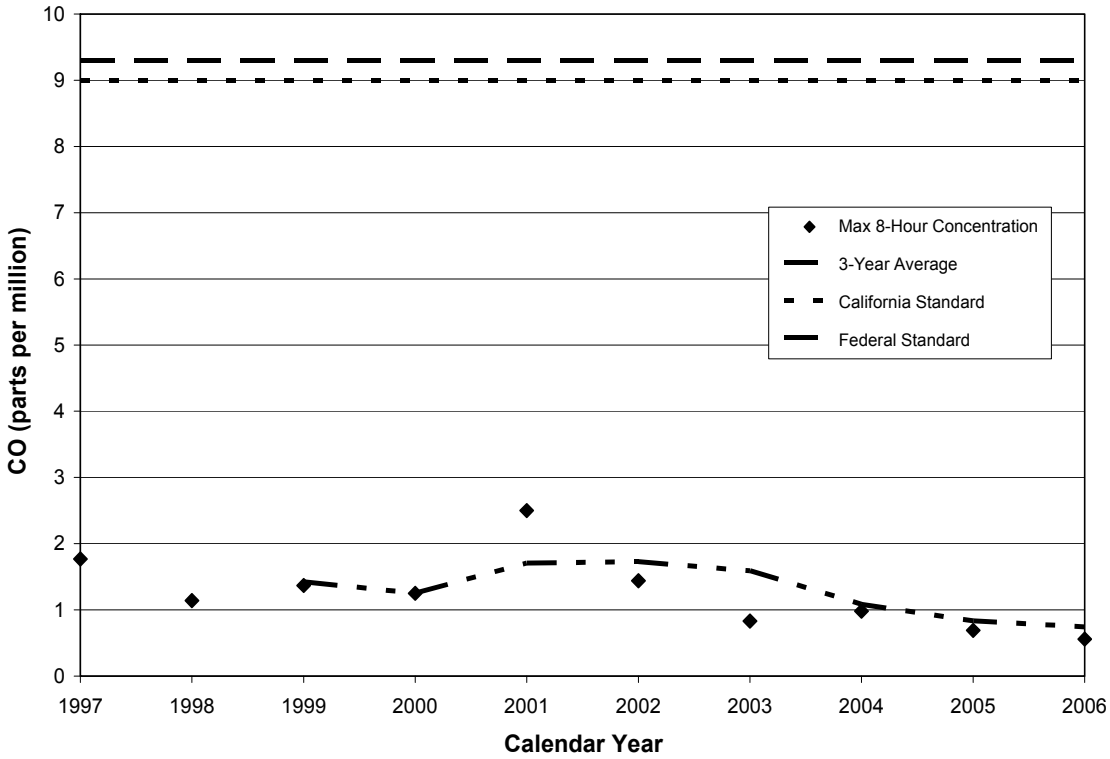

FIGURE 5.1-9
Maximum 8-Hour Average CO Levels
Davis, 1997-2006

TABLE 5.1-5
Sulfur Dioxide Levels in Vallejo, Tuolumne Street Monitoring Station, 1998-2007 (ppm)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Highest 1-hour Average	0.020	0.018	0.017	0.016	0.017	0.012	0.016	0.011	0.016	0.020
Highest 24-Hour Average	0.006	0.008	0.006	0.004	0.004	0.003	0.005	0.005	0.004	0.004
Annual Average	0.002	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Number of Days Exceeding:										
State Standard (0.25 ppm, 1-hour)	0	0	0	0	0	0	0	0	0	0
State Standard (0.04 ppm, 24-hr)	0	0	0	0	0	0	0	0	0	0
Federal Standard (0.5 ppm, 3-hour)	0	0	0	0	0	0	0	0	0	0
Federal Standard (0.14 ppm, 24-hr)	0	0	0	0	0	0	0	0	0	0

Source: California Air Quality Data, CARB website; EPA AIRData website.

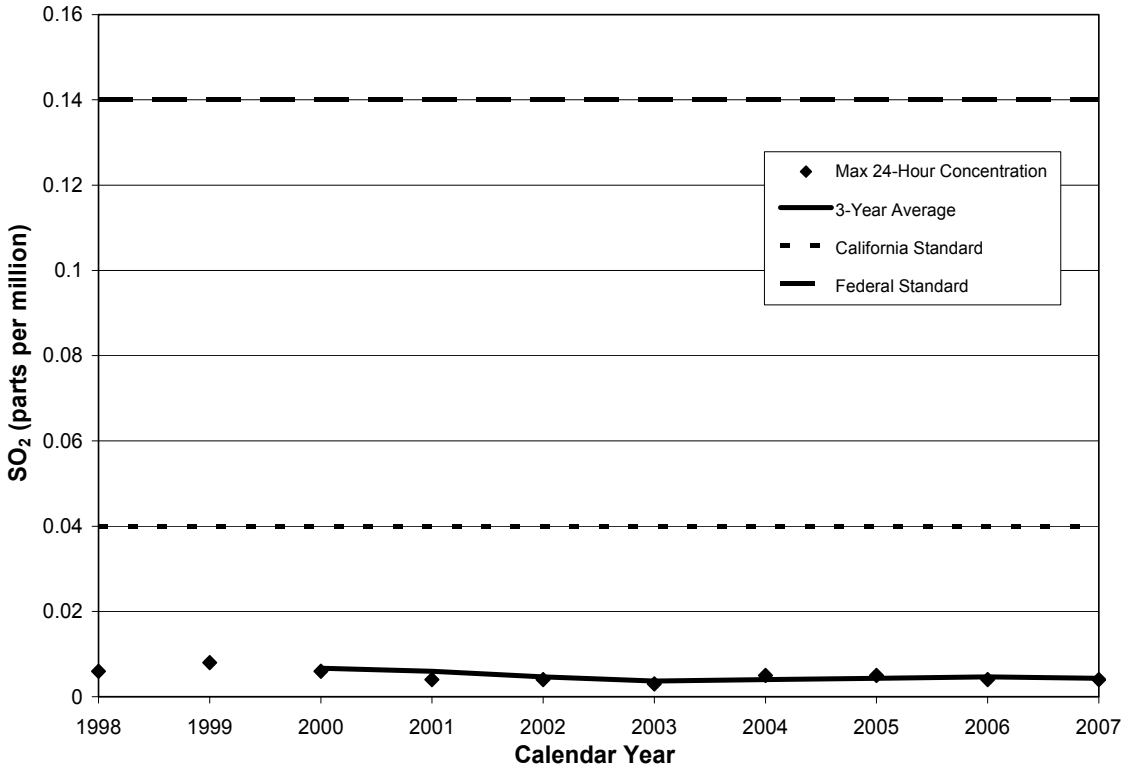

FIGURE 5.1-10
Maximum 24-Hour Average SO_2 Levels
Vallejo, 1998-2007

5.1.3.5 Particulate Sulfates

Particulate sulfates are the product of further oxidation of SO_2. The SVAB is in attainment of the state standard for sulfates. There is no federal standard for sulfates. Because no monitoring for particulate sulfates appears to be underway in northern California, no tables or figures will be presented.

5.1.3.6 Particulate Matter (PM_{10})

Particulates in the air are caused by a combination of wind-blown fugitive dust; particles emitted from combustion sources and manufacturing processes; and organic, sulfate, and nitrate aerosols formed in the air from emitted hydrocarbons, sulfur oxides, and nitrogen oxides. The SVAB is considered to be in nonattainment of both federal and state PM_{10} standards. Table 5.1-6 shows the federal and state air quality standards for PM_{10}, maximum levels recorded at the Merchant Street monitoring station in Vacaville during 1998–2007, and geometric and arithmetic annual averages for the same period. Maximum 24-hour PM_{10} levels continue to exceed the state standard many times per year. Annual average PM_{10} levels remain generally at, or somewhat above, the state standard. The trend of maximum 24-hour average PM_{10} levels is plotted in Figure 5.1-11, and the trend of violations of the state 24-hour standard of 50 µg/m^3 is plotted in Figure 5.1-12. The trend of maximum annual average PM_{10} readings and the California and federal standards are shown in Figure 5.1-13. Maximum 24-hour PM_{10} levels have declined such that the state standard has been exceeded only once in the last 5 years.

The area is classified as non-attainment of state PM_{10} standards, and unclassified with regard to federal standards.

TABLE 5.1-6
PM_{10} Levels in Vacaville, Merchant Street Monitoring Station, 1998-2007 (µg/m^3)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Highest 24-Hour Average	62	68	50	82	66	42	44	35	60	39
Annual Arithmetic Mean (State Standard = 20 µg/m^3)*	17.7	20.5	19.0	20.8	19.9	16.0	18.7	16.4	18.2	14.0
Number of Days Exceeding:										
State Standard (50 µg/m^3, 24-hour)	1	3	0	2	1	0	0	0	1	0
Federal Standard (150 µg/m^3, 24-hour)	0	0	0	0	0	0	0	0	0	0

*State annual standard was recently changed from 30 µg/m^3 to 20 µg/m^3.
Source: California Air Quality Data, CARB website; EPA AIRData website.

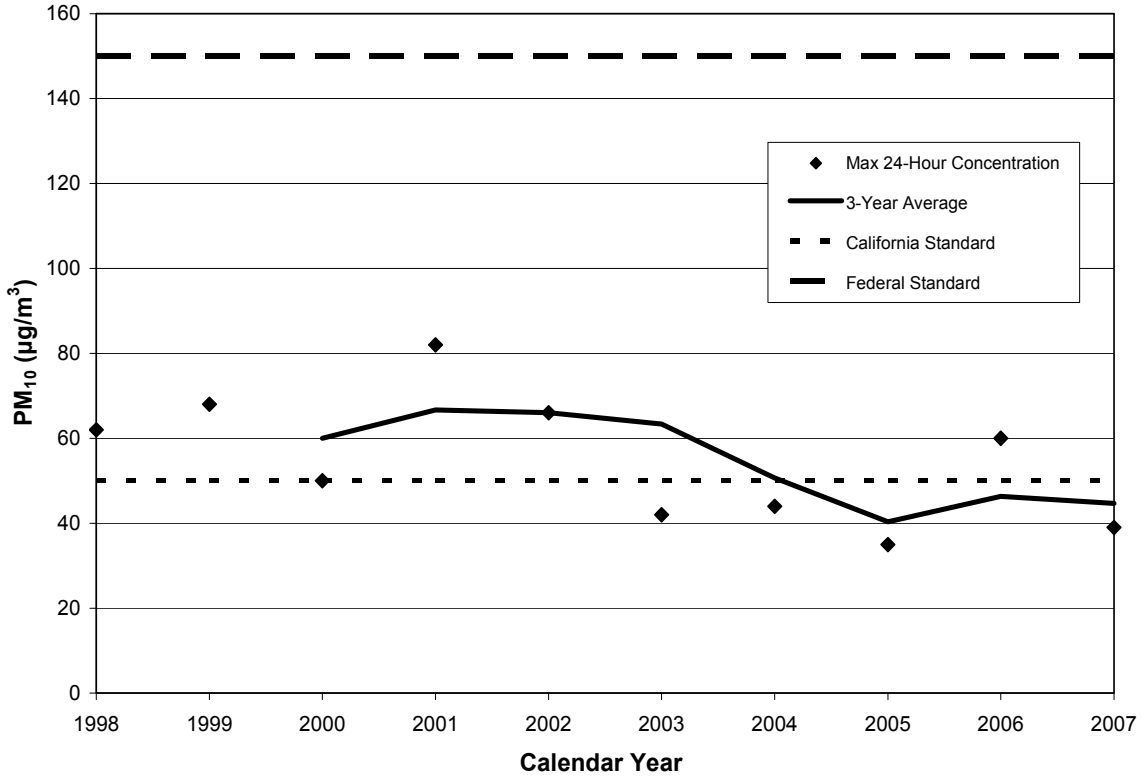

FIGURE 5.1-11
Maximum 24-Hour Average PM_{10} Levels
Vacaville. 1998-2007

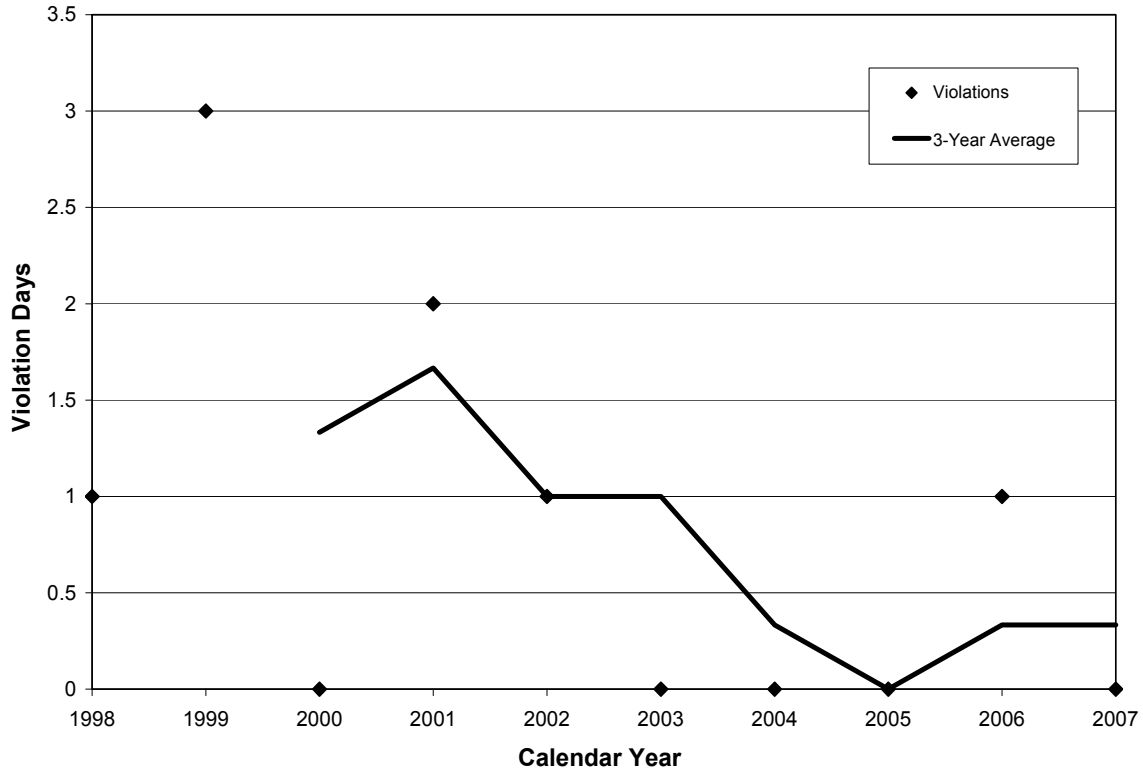

FIGURE 5.1-12
Violations of the California 24-Hour
PM_{10} Standards (50 ug/m^3) – Vacaville, 1998-2007

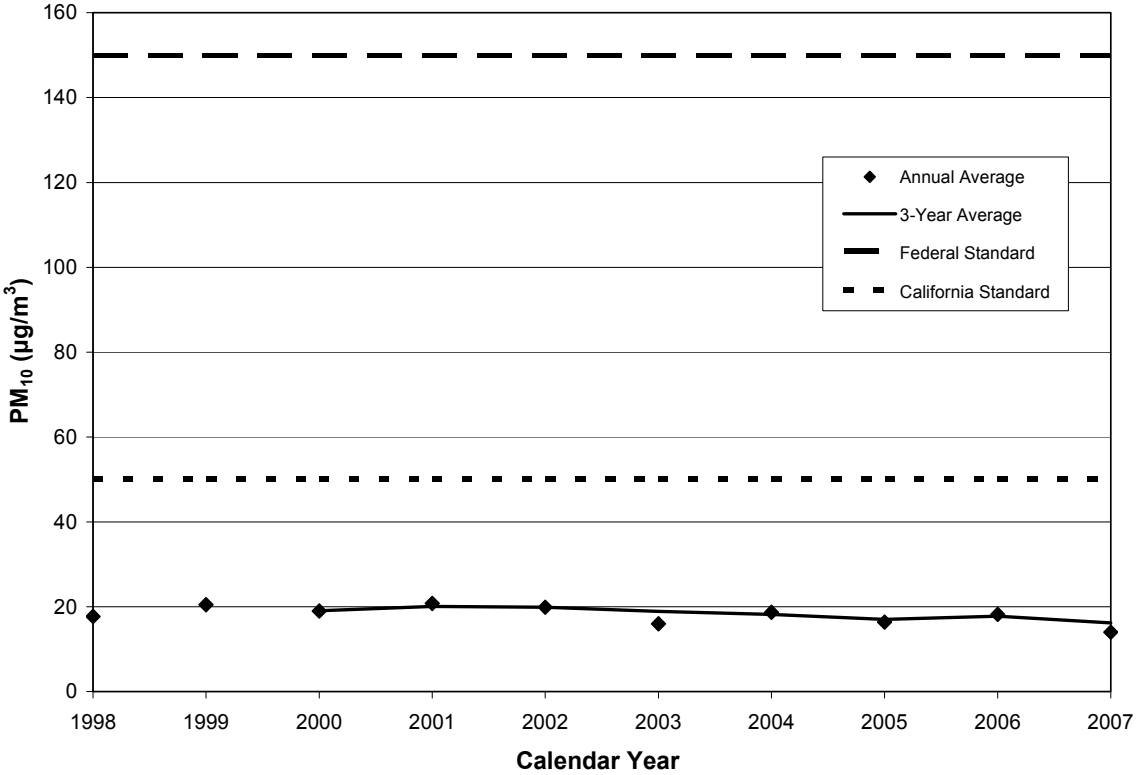

FIGURE 5.1-13
Annual Average PM_{10} Levels
Vacaville, 1998-2007

5.1.3.7 Fine Particulate Matter ($PM_{2.5}$)

Table 5.1-7 shows the state and federal air quality standards for $PM_{2.5}$, maximum levels recorded at the Davis-UCD Campus monitoring station during 1998-2007, and 3-year averages for the same period. The 24-hour average concentrations have exceeded the standard occasionally throughout the monitoring period; however, there are not enough data available to draw any conclusions regarding trends in the 3-year average of 98th percentile values. For air quality planning purposes, the SVAB is considered to be attainment or unclassified for federal and state $PM_{2.5}$ standards. The trend of maximum 24-hour average $PM_{2.5}$ levels is plotted in Figure 5.1-14. The trend of annual $PM_{2.5}$ levels is plotted in Figure 5.1-15.

TABLE 5.1-7
$PM_{2.5}$ Levels at Davis-UCD Campus Monitoring Station, 1997-2006 (µg/m³)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Highest 24-Hour Average	–	–	–	–	–	41.7	49.5	59.5	78.6	62.1
98th Percentile	–	–	–	–	–	–	–	27.3	29.7	30.6
3-yr Average, 98th Percentile	–	–	–	–	–	–	–	–	–	–
Annual Arithmetic Mean (Federal Standard = 15 µg/m³) (State Standard = 12 µg/m³)	–	–	–	–	–	–	9.4	–	8.0	8.8
Number of Days Exceeding:										
Federal Standard (35 µg/m³, 24-hour)	–	–	–	–	–	3	4	3	2	–

Source: California Air Quality Data, CARB website.

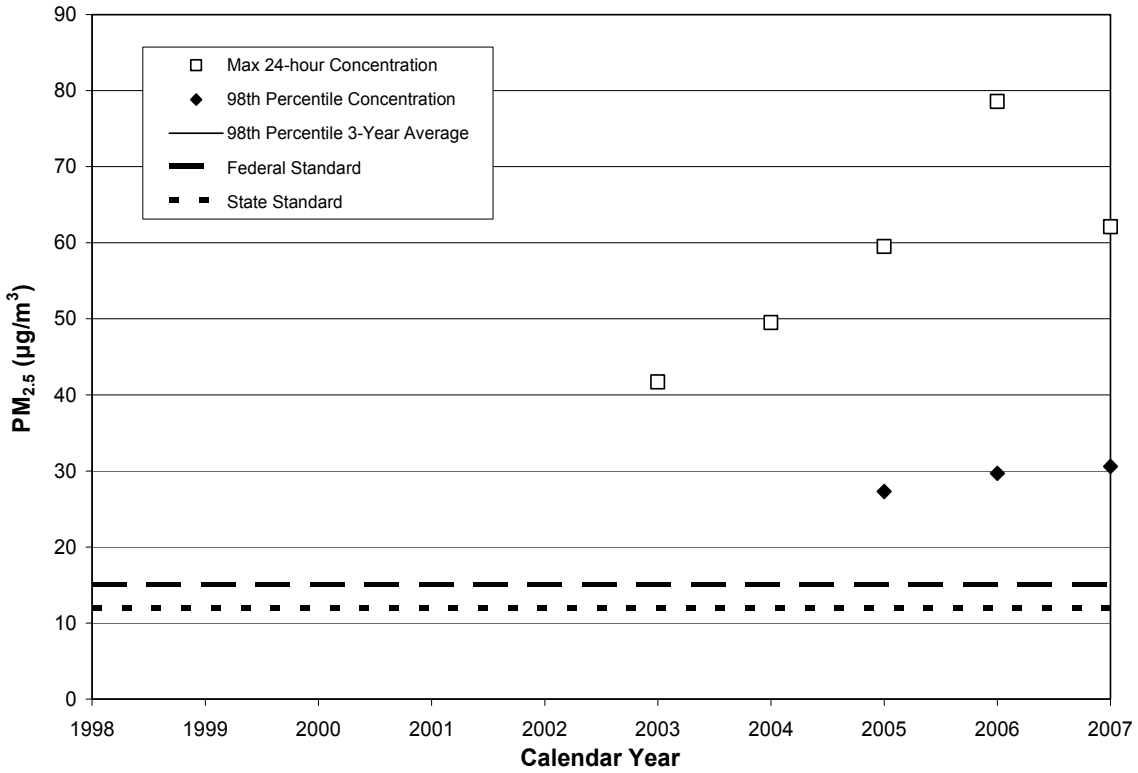

FIGURE 5.1-14
Maximum and 98th Percentile 24-Hour $PM_{2.5}$ Levels
Davis, 1998-2007

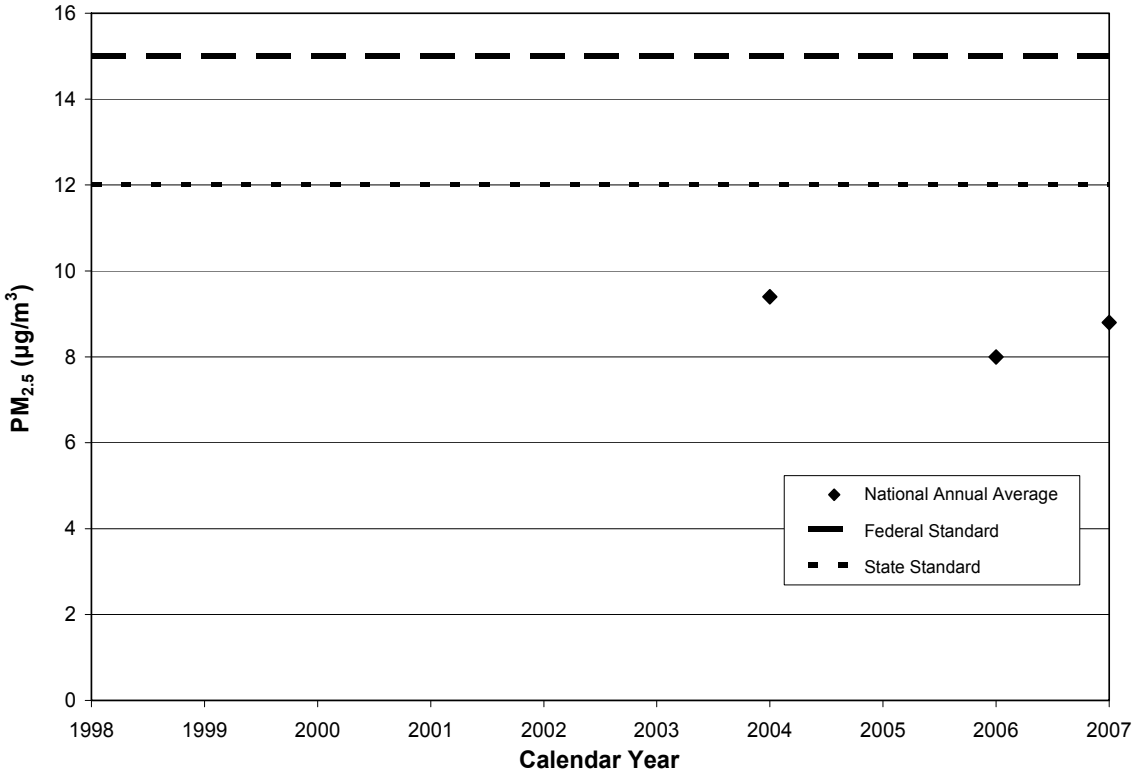

FIGURE 5.1-15
Maximum Annual $PM_{2.5}$ Levels
Davis, 1998-2007

5.1.3.8 Airborne Lead

The majority of lead in the air results from the combustion of fuels that contain lead. Twenty-five years ago, motor gasolines contained relatively large amounts of lead compounds used as octane-rating improvers, and ambient lead levels were relatively high. Beginning with the 1975 model year, new automobiles began to be equipped with exhaust catalysts, which were poisoned by the exhaust products of leaded gasoline. Thus, unleaded gasoline became the required fuel for an increasing fraction of new vehicles, and the phaseout of leaded gasoline began. As a result, ambient lead levels decreased dramatically. and for a number of years, all California air basins, including the SVAB, have been in attainment of state and federal airborne lead standards for air quality planning purposes.

The CARB website does not have any lead data more recent than 2003. Because there are no recent data, no tables or figures will be presented.

5.1.3.9 Summary

Table 5.1-8 summarizes the attainment status for all state and federal ambient air quality standards.

TABLE 5.1-8
Ambient Air Quality Standards Attainment Status

Pollutant	Averaging Time	California	National
Ozone	1 hour	**Nonattainment**	--
	8 hours	**Nonattainment**	**Nonattainment**
Carbon Monoxide	8 hours	Attainment	Attainment
	1 hour	Attainment	Attainment
Nitrogen Dioxide	Annual Average	Attainment	Attainment
	1 hour	Attainment	–
Sulfur Dioxide	Annual Average	–	Attainment
	24 hours	Attainment	Attainment
	3 hours*	–	Attainment
	1 hour	Attainment	–
Suspended Particulate Matter (10 Micron)	Annual Arithmetic Mean	**Nonattainment**	--
	24 hours		Attainment
Suspended Particulate Matter (2.5 Micron)	Annual Arithmetic Mean	Attainment	Attainment
	24 hours	–	Attainment
Sulfates	24 hours	Attainment	–
Lead	30 days	Attainment	–
	Calendar Quarter	–	Attainment
Hydrogen Sulfide	1-hour	Attainment	–
Vinyl Chloride	24-hour	Attainment	–
Visibility Reducing Particles	8-hour (10AM to 6PM PST)	Attainment	–

*This is a national secondary standard, which is designed to protect public welfare.

$\mu g/m^3$ = micrograms per cubic meter
ppm = parts per million

5.1.4 Environmental Analysis

5.1.4.1 Overview of the Analytical Approach to Estimating Facility Impacts

The new emissions sources at the facility include two combustion gas turbines, each with a heat recovery steam generator equipped with a 512 MMBtu/hr duct burner[3]; an auxiliary boiler used to assist in plant startups; a cooling tower; a diesel-fuel-fired emergency generator; and an emergency diesel fire pump engine. The combustion turbines will be equipped with inlet air evaporative coolers to chill turbine inlet air, which increases power output under certain hot ambient conditions. Each turbine will be equipped with dry low-NO_x combustors and an SCR system for NO_x control, and an oxidation catalyst for control of CO. Emissions control systems will be fully operational during all operations except startups and shutdowns. Maximum annual emissions are based on full-time operation of the equipment at maximum firing rates for up to 8,760 hours per year, with up to 365 hours per year of startup/shutdown operation, and 3,500 hours per year of duct firing.

Ambient air quality impact analyses for the facility have been conducted to satisfy the California Energy Commission (CEC) requirements for impacts from criteria pollutants (NO_2, CO, PM_{10}, and SO_2) and noncriteria pollutants during project construction and operation. The analyses also satisfy federal PSD requirements and District requirements. The following sections describe the emission sources that have been evaluated, the results of the ambient impact analyses, and the evaluation of facility compliance with the applicable air quality regulations.

5.1.4.1.1 New Equipment

The proposed combustion turbines are either General Electric Frame 7FA or Siemens SGT6 5000F combustion turbines driving nominal 170 MW turbine generators. The combustion turbines will be fueled exclusively with natural gas. The combustion turbines will be equipped with dry low-NOx burners to control NO_x emissions and inlet air evaporative coolers to maintain turbine output across the full range of ambient temperatures. Post-combustion air pollution controls will include SCR for NO_x control and oxidation catalysts for CO control. Either or both of the combustion turbines may be operated up to 24 hours per day, 7 days per week, 365 days per year. Specifications for the new combustion turbines are summarized in Table 5.1-9. A typical fuel analysis is summarized in Table 5.1-10.

A 37 MMBtu/hour auxiliary boiler will be used to generate steam for bringing equipment up to operating temperature more quickly, shortening the startup time and reducing overall emissions by reducing the amount of time before emission controls begin to operate. Specifications for the auxiliary boiler are shown in Table 5.1-11. A mechanical draft evaporative cooling tower will be constructed adjacent to the turbines. Specifications for the cooling tower are shown in Table 5.1-12. A diesel fuel-fired emergency generator capable of generating 1,000 kilowatts of emergency power will ensure that critical systems can be operated in the event of a power failure. A diesel fuel-fired, 300 horsepower fire pump will supply water in the event of a fire.

[3] The HRSG associated with the Siemens design will have a heat input rating of 500 MMBtu/hr (HHV).

TABLE 5.1-9
New Combustion Turbine Design Specifications

Manufacturer	**General Electric**	**Siemens**
Model	7FA	SGT6 5000F
Fuel	Natural Gas	Natural Gas
Design Ambient Temperature*	26 °F	26 °F
Nominal Heat Input Rate	1,902 MMBtu/hr at HHV	2,183 MMBtu/hr at HHV
Nominal Power Generation Rate	500 MW	500 MW
Nominal Exhaust Temperature	195 °F	184 °F
Exhaust Flow Rate	1,093,336 wacfm	1,052,625 wacfm
Exhaust O_2 Concentration, dry volume	13.80%	12.46%
Exhaust CO_2 Concentration, dry volume	4.11%	4.9%
Exhaust Moisture Content, wet volume	7.6%	8.8%
Emission Controls	SCR (2.0 ppmv NO_x at 15% O_2)	SCR (2.0 ppmv NO_x at 15% O_2)
	Oxidation Catalyst (3.0 ppmv CO at 15% O_2)	Oxidation Catalyst (3.0 ppmv CO at 15% O_2)

*Low-temperature scenario
ppmv = parts per millions by volume

TABLE 5.1-10
Nominal Fuel Properties—Natural Gas

Component Analysis		**Chemical Analysis**	
Component	**Average Concentration, Volume**	**Constituent**	**Percent by Weight**
CH_4	93.1%	C	72.35 %
C_2H_6	3.4%	H	23.32 %
C_3H_8	0.7%	N	2.02 %
C_4H_{10}	0.1%	O	2.30 %
C_5H_{12}	0.1%	S	<0.25 gr/100 scf
N_2	1.25%	Higher Heating Value	1033 Btu/scf 22,480 Btu/lb
CO_2	1.25%		
S	<0.00%		

TABLE 5.1-11
Auxiliary Boiler Specifications

Manufacturer	To Be Determined
Model	To Be Determined
Fuel	Natural Gas
Design Ambient Temperature	26°F
Nominal Heat Input Rate	37 MMBtu/hr at HHV
Nominal Steam Generation Rate	30,000 lb/hr 300 psig saturated
Nominal Exhaust Temperature	375
Exhaust Flow Rate	12,063 wacfm
Exhaust O_2 Concentration, dry volume	3%
Emission Controls	Low-NO_x burners (9 ppm at 3% O_2)

TABLE 5.1-12
Cooling Tower Specifications

Parameter	Value
Water Flow Rate, 10E6 lb/hr	92.46
Water Flow Rate, gal/min	185,000
Drift Rate, %	0.0005
Exhaust Flow Rate, ft^3/min (per cell, 12 cells)	126,000

5.1.4.1.2 Facility Operations

Combustion Turbines and Duct Burners

General Electric and Siemens each provided combustion turbine performance specifications for three temperature scenarios—high temperature, mid-range temperature, and low temperature. The mid-range temperature (76°F) scenario for Siemens turbines with inlet air cooling and duct burners was used to characterize maximum emissions because it has the highest hourly heat input and emission rates. Maximum daily operations are based on full-load operation of two CTGs for 24 hours. Maximum annual emissions are based on full-load operation of both turbines for up to 8,760 hours per year, including up to 365 hours of startup operation for each turbine and 3,500 hours of full-load duct firing for each turbine. Heat input limits, as summarized in Table 5.1-13, were established to provide the basis for the calculation of project and facility emissions.

TABLE 5.1-13
Combustion Turbine Operations

Interval	Heat Input, MMBtu (HHV)*		
	Each CTG	Each Duct Burner	Total, Two CTGs Plus Two Duct Burners
Hourly	2,183	512	5,157
Daily	52,392	12,288	123,767
Annual	19,123,080	1,792,000	39,593,456

*The heat input limits shown reflect the higher of the limits for either the GE or the Siemens turbine/HRSG project configuration. Additionally, values reported are the maximum for each combination of units and time interval. For example, the maximum CTG firing rate does not occur during duct firing; as a result, the maximum hourly heat input does not equal the sum of the maximum CTG and duct burner inputs.

Auxiliary Boiler

The auxiliary boiler will be operated for up to 10 hours for each plant startup, and for up to 200 hours per year additionally for testing and maintenance. As a worst case, it is assumed that 10 hours of auxiliary boiler operation will occur on a day when both turbines are started and operated. CPVVS proposes to limit operation through daily and annual fuel use limits, rather than through limits on hours of operation. The proposed limits are 370 MMBtu per day and 142,450 per year.

Cooling Tower

The cooling tower is assumed to operate 24 hours per day, 8,760 hours per year.

5.1.4.2 Emissions Assessment: Criteria Pollutants

Criteria pollutants emitted from the combustion turbines include NO_x, sulfur oxides (SO_x), CO, ROCs, and fine particulate matter (PM_{10}).[4] The cooling tower will emit only small quantities of PM_{10} and $PM_{2.5}$.[5] This section of the application presents calculated emissions from the new equipment.

The combustion turbines, auxiliary boiler and cooling tower also will emit trace levels of toxic air contaminants (TACs), including ammonia. This section also presents the maximum TAC emissions from the proposed combustion turbines. Tables containing the detailed TAC emission calculations are included in Public Health Appendix 5.9A.

5.1.4.2.1 Criteria Pollutant Emissions: Combustion Turbines

Proposed maximum emissions from the combustion turbines were estimated on an hourly, daily, and annual basis based on expected peaking operation and proposed annual operating limitations.

Emissions during Normal Operations

Emissions of NO_x, CO, and ROC were calculated from emission limits (in ppmv at 15% O_2) and the exhaust flow rates. The NO_x emission limit reflects the application of SCR. The ROC emission limit reflects the use of good combustion practices. The CO emission limit reflects

[4] All of the particulate matter emitted from the CTGs is assumed to be less than 2.5 microns in diameter. All references to PM_{10} include $PM_{2.5}$ as well.

[5] Calculation of the PM_{10} and $PM_{2.5}$ portions of the cooling tower PM is discussed in detail in Appendix 5.1A.

the expected performance of the oxidation catalyst. Although the oxidation catalyst is also expected to reduce ROC emissions, the amount of the reduction is difficult to predict, and therefore this analysis does not take credit for ROC reduction by the oxidation catalyst. Maximum emissions were based on the exhaust rate associated with the heat input rates shown in Table 5.1-13.

SO_x emissions were calculated from the heat input (in MMBtu) and an SO_x emission factor (in lb/MMBtu). The annual average SO_x emission factor of 0.00069 lb/MMBtu was derived from the expected annual average fuel sulfur content of 0.25 grains per 100 standard cubic feet. Maximum SO_x emissions were calculated using the heat input rates in Table 5.1-13, and a short-term maximum fuel sulfur content of 1.00 grains per 100 standard cubic feet.

Maximum hourly PM_{10} emissions were obtained from results of recent source tests of similar turbines. $PM_{2.5}$ emissions were determined based on the assumption that all particulate matter emissions are less than 2.5 microns in size.

Maximum emission rates for the combustion turbines are summarized in Table 5.1-14. The Best Available Control Technology (BACT) analysis upon which the emission factors are based is presented in Appendix 5.1E and summarized in Section 5.1.6.3.

TABLE 5.1-14
Maximum Emission Rates—Each CTG

		lb/MMBtu		lb/hr	
Pollutant	**ppmv at 15% O_2**	**w/ Duct Burner**	**w/o Duct Burner**	**w/ Duct Burner**	**w/o Duct Burner**
NO_x	2.0[a]	0.0073	0.0073	18.72	15.85
SO_2[b]	0.55	0.0028	0.0028	7.14	6.04
CO	3.0[a]	0.0066	0.0066	17.10	14.47
ROC	2.0[a]	0.0025	0.0025	6.53	5.53
PM_{10}	n/a	0.0052	0.0072	9.0	7.5

[a]NO_x, CO, and ROC emission rates exclude startups and shutdowns (see Table 5.1-15).
[b]Based on maximum short-term natural gas sulfur content of 1.0 gr/100 scf.

Emissions During Startup and Shutdown

Maximum emission rates expected to occur during a startup or shutdown are shown in Table 5.1-15. PM_{10} and SO_2 emissions are not included in this table because emissions of these pollutants will be lower during startup and shutdown than during baseload facility operation.

TABLE 5.1-15
CTG Startup and Shutdown Emission Rates

	NO_x		CO		ROC	
	Max	Annual Average	Max	Annual Average	Max	Annual Average
Startup and Shutdown, lb/hr	140[6]	100	500	250	16	16

The auxiliary boiler will also operate during turbine startup. The boiler may be fired for up to 10 hours before and during a cold startup; boiler operation will be somewhat less for a warm startup. Emissions in Table 5.1-16 are based on 10 hours of boiler operation per startup, plus 200 hours per year of operation for testing and maintenance.

TABLE 5.1-16
Maximum Emission Rates—Auxiliary Boiler

Pollutant	ppmv at 3% O_2	lb/MMBtu	lb/hr
NO_x	9.0	0.011	0.40
SO_2*	1.65	0.0028	0.10
CO	100	0.037	1.36
ROC	3.0	0.0042	0.16
PM_{10}/ $PM_{2.5}$	n/a	0.0075	0.28

*Based on maximum short-term natural gas sulfur content of 1.0 gr/100 scf.

5.1.4.2.2 Criteria Pollutants: Cooling Tower

Maximum emissions from the cooling tower are calculated from the average water flow rate, maximum drift rate, and maximum total dissolved solids of the makeup water. This calculation is shown in Appendix 5.1A, Table 5.1A-4. Emissions are calculated on a 24-hour per day, 8,760 hour per year basis. The cooling tower will emit a maximum of 43.9 pounds per day and 8.02 tons per year (tpy) of PM_{10}.

5.1.4.2.3 Criteria Pollutant Emissions Summary

Maximum facility emissions are shown in Table 5.1-17. Maximum hourly, daily, and annual emissions were calculated for each turbine manufacturer for four basic operating cases:

- CASE 1: Daily Cycling (one hot start per turbine per day, one shutdown per turbine per day, 4 hours turbine downtime per day; 3,500 hours per year duct firing per turbine).
- CASE 2: Weekly Cycling (Turbine 1: one cold start per week, 72 hours shutdown prior to cold start; turbine 2 on daily cycle; 3,500 hours per year duct firing per turbine)
- CASE 3: Base Load (Turbine 1: one cold start per month, 72 hours shutdown prior to cold start; Turbine 2: one hot start per month; 4 hours shutdown prior to hot start; 3,500 hours per year duct firing per turbine)

[6] Limited by District Rule 2.16; see Section 5.1.7.3.

- CASE 4: Full Annual (8,760 hours per year of baseload operation per turbine; 3,500 hours per year duct firing per turbine).

Details of the calculations are shown in Tables 5.1A-9A and 9B, Appendix 5.1A. The worst case emissions for each time period (hourly, daily, and annual) from any of these four scenarios, for either turbine model, are presented below.

TABLE 5.1-17
Emissions from New Equipment

Emissions/Equipment	NO_x, lbs	SO_2, lbs	CO, lbs	ROC, lbs	PM_{10}, lbs
Maximum Hourly Emissions					
CTGs + Duct Burners	280	14.3	1,000	32	18
Cooling Tower	–	–	–	–	1.8
Auxiliary Boiler	0.4	0.1	1.4	0.2	0.3
Emergency Standby Engine (testing)	15.9	0	0.6	0	0.1
Fire pump Engine (testing)	2.9	0	0.2	0.2	0.1
Total, pounds per hour	**299.2**	**14.5**	**1,002.2**	**32.4**	**20.3**
Maximum Daily Emissions					
CTGs	1,383.7	342.7	2,752.3	351.3	432.0
Cooling Tower	–	–	–	–	43.9
Auxiliary Boiler	4.0	0.10	13.6	1.6	2.8
Emergency Standby Engine (testing)	15.9	0	0.6	0	0.1
Fire pump Engine (testing)	2.9	0	0.2	0.2	0.1
Total, pounds per day	**1,406.6**	**343.7**	**2,766.7**	**353**	**478.9**
Maximum Annual Emissions, tons per year					
CTGs + duct burners	156,5	14.2	200.8	51.9	71.0
Cooling Tower	–	–	–	–	8.0
Auxiliary Boiler	0.8	0.0	2.6	0.3	0.5
Emergency Standby Engine (testing)	0.1	0	0	0	0
Fire pump Engine (testing)	0.4	0	0	0	0
Total, tons per year	**157.7**	**14.2**	**203.4**	**51.9**	**79.0**

5.1.4.3 Emissions Assessment: Toxic Air Contaminants

Noncriteria pollutant (toxic air contaminant [TAC]) emissions were estimated for the proposed new project equipment. These emissions are summarized in Tables 5.1-18, 5.1-19, and 5.1-20. The detailed noncriteria pollutant emissions calculations and the associated screening level health risk assessment are included in the Public Health section (see Section 5.9).

TABLE 5.1-18
Noncriteria Pollutant Emissions for the CTGs/HRSGs and Auxiliary Boiler

	Maximum Proposed Emissions (tpy)	
Compound	**CTGs/HRSGs**	**Aux. Boiler**
Ammonia	103.3	n/a
Propylene	14.4	0.001
Hazardous Air Pollutants (HAPs)		
Acetaldehyde	0.76	<0.001
Acrolein	0.07	<0.001
Benzene	0.06	<0.001
1,3-Butadiene	0.008	n/a
Ethylbenzene	0.61	<0.001
Formaldehyde	6.8	0.005
Hexane	4.8	<0.001
Naphthalene	0.03	<0.001
PAHs (other)	2.44×10^{-3}	<0.001
Propylene Oxide	0.56	n/a
Toluene	2.5	<0.001
Xylene	1.2	0.001
TOTAL HAPs	**17.4**	**0.008**

TABLE 5.1-19
Noncriteria Pollutant Emissions from the Emergency Diesel Engines

	Maximum Proposed Emissions, tpy	
Compound	**Emergency Generator**	**Diesel Fire Pump Engine**
Diesel Particulate Matter	1.90E-03	1.98E-03

TABLE 5.1-20
Noncriteria Pollutant Emissions from the Cooling Tower

Compound	Maximum Proposed Emissions, lb/yr
Copper	0.56
Zinc	2.8
HAPs	
Antimony	0.02
Arsenic	0.06
Beryllium	0.19
Cadmium	0.005
Chromium (VI)	0.01
Cyanide	0.07
Lead	0.04
Manganese	0.45
Mercury	<0.001
Nickel	0.20
Selenium	0.06
Total HAPs	**1.12 lb/yr**

5.1.4.4 Air Quality Impact Analysis

The CEC requires various ambient air quality impact analyses for California Environmental Quality Act review; those analyses are presented in the following subsections. These analyses also demonstrate compliance with air quality impact requirements under federal PSD and District permitting regulations.

5.1.4.4.1 Air Quality Modeling Methodology

An assessment of impacts from the combustion turbines on ambient air quality has been conducted using EPA-approved air quality dispersion models. These models are based on various mathematical descriptions of atmospheric diffusion and dispersion processes in which a pollutant source impact can be calculated over a given area.

The impact analysis was used to determine the worst-case ground-level impacts of the new turbines. The results were compared with established state and federal ambient air quality standards and Prevention of Significant Deterioration (PSD) significance levels. If the standards are not exceeded, it is assumed that, in the operation of the facility, no exceedances are expected under any conditions. In accordance with the air quality impact analysis guidelines developed by EPA (40 Code of Federal Regulations [CFR] Part 51, Appendix W: Guideline on Air Quality Models), the ground-level impact analysis includes the following assessments:

- Impacts in simple, intermediate, and complex terrain
- Aerodynamic effects (downwash) due to nearby building(s) and structures
- Impacts from inversion breakup (fumigation)

Simple, intermediate, and complex terrain impacts were assessed for all meteorological conditions that would limit the amount of final plume rise. Plume impaction on elevated terrain, such as on the slope of a nearby hill, can cause high ground-level concentrations, especially under stable atmospheric conditions. Another dispersion condition that can cause high ground-level pollutant concentrations is caused by building downwash. Building downwash can occur when wind speeds are high and a building or structure is in close proximity to the emission stack. This can result in building wake effects where the plume is drawn down toward the ground by the lower pressure region that exists in the lee side (downwind) of the building or structure.

Fumigation conditions occur when the plume is emitted into a low-lying layer of stable air (inversion) that then becomes unstable, resulting in a rapid mixing of pollutants towards the ground. The low mixing height that results from this condition allows little diffusion of the stack plume before it is carried downwind to the ground. Although fumigation conditions rarely last as long as an hour, relatively high ground-level concentrations may be reached during that period. Fumigation tends to occur under clear skies and light winds, and is more prevalent in the summer.

The basic model equation used in this analysis assumes that the concentrations of emissions within a plume can be characterized by a Gaussian distribution about the centerline of the plume. Concentrations at any location downwind of a point source such as a stack can be determined from the following equation:

$$C(x,y,z,H) = \left(\frac{Q}{2\pi\sigma_y\sigma_z u}\right) * \left(e^{-1/2(y/\sigma_y)^2}\right) * \left[\left\{e^{-1/2(z-H/\sigma_z)^2}\right\} + \left\{e^{-1/2(z+H/\sigma_z)^2}\right\}\right]$$

Where:

C	=	the concentration in the air of the substance or pollutant in question
Q	=	the pollutant emission rate
σyσz	=	the horizontal and vertical dispersion coefficients, respectively, at downwind distance x
u	=	the wind speed at the height of the plume center
x,y,z	=	the variables that define the 3-dimensional Cartesian coordinate system used; the downwind, crosswind, and vertical distances from the base of the stack
H	=	the height of the plume above the stack base (the sum of the height of the stack and the vertical distance that the plume rises due to the momentum and/or buoyancy of the plume)

Gaussian dispersion models are approved by EPA for regulatory use and are based on conservative assumptions (i.e., the models tend to overpredict actual impacts by assuming steady-state conditions, no pollutant loss through conservation of mass, no chemical reactions, etc.). The EPA models were used to determine if ambient air quality standards would be exceeded, and whether a more accurate and sophisticated modeling procedure would be warranted to make the impact determination. The following sections describe:

- Screening modeling procedures
- Refined air quality impact analysis

- Existing ambient pollutant concentrations and preconstruction monitoring
- Results of the ambient air quality modeling analyses
- PSD increment consumption

The screening and refined air quality impact analyses were performed using AERMOD Version 07026. The air quality modeling analysis followed the January 2008 EPA *AERMOD Implementation Guide* and EPA's *Guideline on Air Quality Models* (EPA, 2005). EPA default options were used.

AERMOD is a Gaussian dispersion model capable of assessing impacts from a variety of source types in areas of simple, intermediate, and complex terrain. The model can account for settling and dry deposition of particulates; area, line, and volume source types; downwash effects; and gradual plume rise as a function of downwind distance. The model is capable of estimating concentrations for a wide range of averaging times (from one hour to one year).

The following inputs are required by the AERMOD model:

- Model options
- Meteorological data
- Source data
- Receptor data

Model options refer to user selections that account for conditions specific to the area being modeled or to the emissions source that needs to be examined. Examples of model options include use of site-specific vertical profiles of wind speed and temperature; consideration of stack and building wake effects; and time-dependent exponential decay of pollutants. The model supplies recommended default options for the user. Except where explicitly stated (such as for building downwash, as described in more detail below), default values were used. A number of these default values are required for EPA and local district approval of model results and are listed below.

- Urban dispersion coefficients (see discussion below)
- Gradual plume rise
- Stack tip downwash
- Buoyancy induced dispersion
- Calm processing
- Default urban wind profile exponents
- Default vertical temperature gradients = 0.02, 0.035
- 10 meter anemometer height

AERMOD uses hourly meteorological data to characterize plume dispersion. The representativeness of the data is dependent on the proximity of the meteorological monitoring site to the area under consideration, the complexity of the terrain, the exposure of the meteorological monitoring site, and the period during which the data are collected. The meteorological data used in this analysis were collected at the Travis Air Force Base located 5.3 miles southwest of the site. This data set was selected to be representative of meteorological conditions at the CPVVS site and to meet the requirements of the EPA *On-Site Meteorological Program Guidance for Regulatory Model Applications* (EPA-450/4-87-013, August 1995). The analysis used meteorological data collected during 2003-2007.

The required emission source data inputs to AERMOD include source locations, source elevations, stack heights, stack diameters, stack exit temperatures and velocities, and emission rates. The source locations are specified for a Cartesian (x,y) coordinate system where x and y are distances east and north in meters, respectively. The Cartesian coordinate system used is the Universal Transverse Mercator Projection (UTM). The stack height that can be used in the model is limited by federal Good Engineering Practice (GEP) stack height restrictions, discussed in more detail below. In addition, AERMOD requires nearby building dimension data to calculate the impacts of building downwash.

For the purposes of modeling, a stack height beyond what is required by GEPs is not allowed. However, this requirement does not place a limit on the actual constructed height of a stack. GEP as used in modeling analyses is the height necessary to ensure that emissions from the stack do not result in excessive concentrations of any air pollutant in the immediate vicinity of the source as a result of atmospheric downwash, eddies, or wakes that may be created by the source itself, nearby structures, or nearby terrain obstacles. In addition, the GEP modeling restriction assures that any required regulatory control measure is not compromised by the effect of that portion of the stack that exceeds the GEP. The EPA guidance (*Guideline for Determination of Good Engineering Practice Stack Height*, Revised June 1985) for determining GEP stack height indicates that GEP is the lesser of 65 meters or H_g, where H_g is calculated as follows:

$$H_g = H + 1.5L$$

Where:

H_g = GEP stack height, measured from the ground-level elevation at the base of the stack

H = height of nearby structure(s) measured from the ground-level elevation at the base of the stack

L = lesser dimension, height or maximum projected width, of nearby structure(s)

In using this equation, the guidance document indicates that both the height and width of the structure are determined from the frontal area of the structure, projected onto a plane perpendicular to the direction of the wind.

For the two turbine stacks, the nearby (influencing) structures are their respective HRSGs, which are 94.7 feet (28.9 m) high and 100.9 feet (76.2 m) in length. Thus H = L = 94.7 feet, and H_g = 2.5 * 94.7 = 236.8 ft, so the proposed stack height of 150 feet does not exceed GEP stack height.

For regulatory applications, a building is considered sufficiently close to a stack to cause wake effects when the downwind distance between the stack and the nearest part of the building is less than or equal to five times the lesser of the height or the projected width of the building. Building dimensions for the buildings analyzed as downwash structures were obtained from plot plans. The building dimensions were analyzed using the Building Profile Input Program to calculate 36 wind-direction-specific building heights and projected building widths for use in building wake calculations. The building dimensions used in the GEP analysis are shown in Appendix 5.1B, Table 5.1B-1.

Screening Procedures and Unit Impact Modeling

To ensure the impacts analyzed were for maximum emission levels and worst-case dispersion conditions, a screening procedure was used to determine the inputs to the impact modeling. The screening procedure analyzed the turbine operating conditions that would result in the maximum impacts on a pollutant-specific basis. The operating conditions examined in this screening analysis, along with their exhaust and emission characteristics, are shown in Appendix 5.1B, Tables 5.1B-2A and 2B. These operating conditions represent turbine operation at maximum, typical, and minimum ambient operating temperatures (95°F, 76°F, and 26°F for the Siemens design; and 105°F, 59°F, and 26°F for the GE design), and at full and minimum (50 percent) loads. Operation at full load was evaluated both with and without duct burners.

Ambient impacts for each of the operating cases were modeled using EPA's AERMOD model, as described above. The results of the unit impact analysis are presented in Appendix 5.1B, Table 5.1B-3. The analysis showed that for most pollutants and averaging periods, modeled impacts were highest under full load operating conditions for the Siemens CTGs, while PM_{10} impacts were highest under minimum load conditions for the GE CTGs.

Refined Air Quality Impact Analysis

The stack parameters and emission rates used to model impacts from the combustion turbines, auxiliary boiler, cooling tower and emergency engines are shown in Appendix 5.1B, Table 5.1B-4. Based on the results of the screening analysis described above, the average-temperature low-load Siemens stack parameters and emission rates were used in the refined modeling analysis to evaluate total project impacts for gaseous pollutants, and the high-temperature, low-load GE stack parameters were used for evaluating total project PM_{10} and $PM_{2.5}$ impacts. The model receptor grids were derived from 30-meter DEM data. Cartesian coordinate receptor grids were used to provide adequate spatial coverage surrounding the project area for assessing ground-level pollution concentrations, to identify the extent of significant impacts, and to identify maximum impact locations. A 250-meter resolution coarse receptor grid was developed, which extend outwards at least 10 km from the location of the new turbine stack.

In addition, more refined nested grids were developed to efficiently identify the maximum impact areas. These nested grids had the following resolutions:

- 25-meter resolution along the facility fence line in a single tier of receptors composed of four segments extending out to 100 meters from the fence line;
- 100-meter resolution from 100 meters to 1,000 meters from the fence line; and
- 250-meter resolution from 1 km out to at least 10 km from the site.

When maximum impacts occurred in the 100- or 250-meter spaced areas, additional refined receptor grids with 25-meter resolution were placed around each maximum coarse grid impact and extended out to a distance of two coarse grid spacings from the coarse grid maxima in all directions from that point of impact. A map showing the layout of each receptor grid around the site plan is presented in Figure 5.1B-1, Appendix 5.1B.

The unit impact/screening and refined analyses included simple, intermediate, and complex terrain. Terrain features were taken from USGS DEM data and 7.5-minute

quadrangle maps of the area including Allendale, Elmira, Dixon, Denverton, Bird's Landing, Fairfield North, Fairfield South, Mount Vaca, and Dozier.

Specialized Modeling Analyses

Fumigation Modeling. Fumigation occurs when a stable layer of air lies a short distance above the release point of a plume and unstable air lies below. Under these conditions, an exhaust plume may be drawn to the ground, causing high ground-level pollutant concentrations. Although fumigation conditions rarely last as long as one hour, relatively high ground-level concentrations may be reached during that time. For this analysis, fumigation was assumed to occur for up to 90 minutes, per EPA guidance.

The SCREEN3 model was used to evaluate maximum ground-level concentrations for short-term averaging periods (24 hours or less). Although this modeling analysis is not required by district regulation, guidance from the EPA[7] was followed in evaluating fumigation impacts. Since SCREEN3 is a single-source model, a single turbine was modeled and the results multiplied by two. The maximum fumigation impact from the turbines occurred approximately 18.5 km from the facility. This analysis, which is shown in more detail in Appendix 5.1B, Table 5.1B-5, showed that impacts under fumigation conditions are expected to be lower than the maximum concentrations calculated by ISC under downwash conditions.

Turbine Startup. Facility impacts were also evaluated during the startup of two turbines simultaneously to evaluate short-term impacts under worst-case startup emissions. Emission rates used for this scenario were based on an engineering analysis of available data. Turbine exhaust parameters for 50% load operation were used to characterize turbine exhaust during startup and the CO and NO_x emission rates from Table 5.1-15 were used. NO_2 impacts were evaluated using the PVMRM methodology discussed below.

Stack parameters and emission rates for modeling startup impacts are shown in Table 5.1B-6, Appendix 5.1B.

Ozone Limiting. Annual NO_2 concentrations were calculated using the Ambient Ratio Method, adopted in Supplement C to the *Guideline on Air Quality Models* (EPA, 1995). The Guideline allows a nationwide default of 75 percent for the conversion of NO to NO_2 on an annual basis and the calculation of NO_2/NO_x ratios.

The Plume Volume Molar Ratio Method (PVMRM) adaptation of the Ozone Limiting Method (Cole and Summerhays, 1979) was used to determine the extent to which the NO emitted from the exhaust stacks is converted to NO_2 when it reaches the ground. AERMOD

PVMRM calculates the NO_2 concentration using hourly ozone data. Hourly ozone data collected at the Vacaville-Urbati Drive monitoring station during the years 2003-2007 was used in conjunction with PVMRM to calculate hourly NO_2 concentrations from hourly NO_x concentrations. Missing hourly ozone data was substituted prior to use with day-appropriate values (e.g., from the previous day, or the next day, for the same hour).

The PVMRM involves an initial comparison of the estimated maximum NO_x concentration and the ambient ozone concentration left in the plume after reaction of NO with ozone to determine which is the limiting factor to NO_2 formation. If the remaining ozone

7 EPA-454/R-92-019, "Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised."

concentration is greater than the maximum NO_x concentration, total conversion is assumed. If the NO_x concentration is greater than the remaining ozone concentration, the formation of NO_2 is limited by the remaining ambient ozone concentration. In this case, the NO_2 concentration is set equal to the ozone concentration plus a correction factor that accounts for in-stack and near-stack thermal conversion.

Turbine Commissioning. There are several high emissions scenarios possible during commissioning. The first is the period prior to SCR system and oxidation catalyst installation, when the combustor is being tuned. Under this scenario, NO_x emissions would be high because the NO_x emissions control system would not be functioning and because the combustor would not be tuned for optimum performance. CO emissions would also be high because combustor performance would not be optimized and the CO emissions control system would not be functioning. The second high emissions scenario may occur when the combustor has been tuned but the SCR and oxidation catalyst installation is not complete, and other parts of the turbine operating system are being checked out. Since the combustor would be tuned but the control system installation would not be complete, NO_x and CO levels would again be high. Commissioning activities and expected emissions are discussed in more detail below.

Preconstruction Monitoring

To ensure that the impacts from the combustion turbines will not cause or contribute to a violation of an ambient air quality standard or an exceedance of a PSD increment, an analysis of the existing air quality in the project area is necessary.

In accordance with Section 2.4 of the EPA PSD guideline, the last three years of ambient monitoring data may be used if they are representative of the area's air quality where the maximum impacts occur due to the proposed source.

The background data need not be collected on site, as long as the data are representative of the air quality in the subject area (40 CFR 51, Appendix W, Section 9.2). Three criteria are applied in determining whether the background data are representative: (1) location, (2) data quality, and (3) data currentness.[8] These criteria are defined as follows:

- **Location:** The measured data must be representative of the areas where the maximum concentration occurs for the proposed stationary source, existing sources, and a combination of the proposed and existing sources.
- **Data quality:** Data must be collected and equipment must be operated in accordance with the requirements of 40 CFR Part 58, Appendices A and B, and PSD monitoring guidance.
- **Currentness:** The data are current if they have been collected within the preceding three years and they are representative of existing conditions.

All of the data used in this analysis meet the requirements of Appendices A and B of 40 CFR Part 58, and thus all meet the criterion for data quality. All of the data have been collected within the preceding three years, and thus all meet the criterion for currentness.

[8] Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD), EPA, 1987.

Ambient NO_2, CO, and $PM_{2.5}$ data are collected at the Davis-UCD monitoring station, located 15 miles northeast of the project site. Ambient PM_{10} data are collected in Vacaville, about 5 miles west of the project site. The ambient pollution levels monitored at the UCD and Vacaville monitoring stations represent area-wide ambient conditions rather than the localized impacts of any particular facility. CO levels are affected mainly by vehicle traffic; the Davis station and the project site are located a similar distance from Highway 80, and a similar distance from the urban areas of Fairfield and Vacaville, respectively. Therefore CO concentrations monitored in the location are expected to represent CO levels in the project area.

Ambient SO_2 data are collected in Vallejo, 24 miles to the southwest. There are no local sources of SO_2 in either location that would be expected to affect monitored concentrations. Therefore, the Vallejo station provides representative background data for assessing the SO_2 impacts of the project, and thus meets the location criterion.

Results of the Ambient Air Quality Modeling Analyses

The maximum facility impacts calculated from the AERMOD and fumigation modeling analyses described above are summarized in Table 5.1-21. The highest modeled impacts are expected to occur under startup conditions.

The maximum modeled 24-hour average impact for PM_{10} exceeds PSD preconstruction monitoring level, as shown in Table 5.1-22. However, preconstruction monitoring is not required because the PM_{10} monitor at Vacaville meets the criteria for location, quality and currentness as discussed above.

TABLE 5.1-21
Summary of Project Impacts

		Modeled Concentration (µg/m^3)		
Pollutant	**Averaging Time**	**Normal Operation**	**Startup**	**Inversion Breakup Fumigation**
NO_2	1-hour	170.1	125.6	6.6
	Annual	2.3	Note a	Note c
SO_2	1-hour	12.9	Note b	2.5
	3-hour	7.1	Note b	2.1
	24-hour	3.6	Note a	0.9
	Annual	0.2	Note a	Note c
CO	1-hour	45.0	858	6.0
	8-hour	23.6	221	3.8
PM_{10} (including cooling tower)[d]	24-hour	14.7	Note a	1.1
	Annual	3.6	Note a	Note c
$PM_{2.5}$ (including cooling tower)[d]	24-hour	7.5	Note a	1.1
	Annual	2.2	Note a	Note c

[a]Not applicable, because startup emissions are included in the 8-hour and longer-term ("Normal Operation") modeling.

[b]Not applicable, because emissions are not elevated above normal levels during startup.

[c]Not applicable, because inversion breakup is a short-term phenomenon and as such is evaluated only for short-term averaging periods.

[d]Cooling tower not included in fumigation modeling.

TABLE 5.1-22
Evaluation of Preconstruction Monitoring Requirements

Pollutant	Averaging Time	Exemption Concentration ($\mu g/m^3$)	Maximum Modeled Concentration ($\mu g/m^3$)	Exceed Monitoring Threshold?
NO_x	annual	14	2.3	no
SO_2	24-hr	13	3.6	no
CO	8-hr	575	221	no
PM_{10}	24-hr	10	14.7	yes

Impacts During Turbine Commissioning

As discussed previously, NO_2 and CO impacts could be higher during commissioning than under other operating conditions already evaluated. The commissioning period for the project is comprised of several equipment tests. These tests and the associated NO_x and CO emissions are briefly summarized below. The emissions calculations are shown in more detail in Table 5.1B-7, Appendix 5.1B.

The maximum modeled NO_2 and CO impact during commissioning will occur under the turbine operating conditions that are least favorable for dispersion. As shown in the unit impacts analysis, these conditions are expected to occur under part-load, high-temperature conditions.

Maximum 1-hour NO_2 impacts were determined using the PVMRM methodology discussed earlier. NO_2 impacts from two turbines, each emitting 140 lb/hr under part-load, high-temperature conditions have a maximum impact of 126 $\mu g/m^3$. Using the background NO_2 concentration of 84 $\mu g/m^3$, the total impact will not exceed 210 $\mu g/m^3$, which is below the state 1-hour NO_2 standard of 339 $\mu g/m^3$.

Based on a maximum combined emission rate of 7,625 lb/hr (960 g/sec), the CO impacts are not expected to exceed 6,544 $\mu g/m^3$. Combined with the background concentration of 2,780 $\mu g/m^3$, the total impact will not exceed 9,324 $\mu g/m^3$, which is well below the state 1-hour CO standard of 23,000 $\mu g/m^3$.

Ambient Air Quality Impacts

To determine a project's air quality impacts, the modeled concentrations are added to the background ambient air concentrations and then compared to the applicable ambient air quality standards (except for $PM_{2.5}$; see below). As a screening analysis, the maximum modeled concentration is added to the maximum background ambient concentration. If compliance can be demonstrated by adding the highest measured background level to the highest modeled impact, then compliance is assured for all other combinations of backgrounds and projects.

The modeled concentrations are presented in previous tables. The maximum background ambient concentrations are listed in the following text and tables. A detailed discussion of why the data collected at these stations are representative of ambient concentrations in the vicinity of the project was provided above.

The method for determining air quality impacts just described is a screening method. However, if compliance cannot be demonstrated this way, a more detailed analysis is required to demonstrate compliance. Because the conditions that lead to the highest background concentrations are not likely to be the same conditions that result in maximum project impacts, the combined impact of project and background can be better predicted by matching measured concentrations with the modeling results from that period's meteorology.

For $PM_{2.5}$, contemporaneous (with the meteorological data) 24-hour average concentrations during the period 2004 through 2007 were used to represent project background concentrations. $PM_{2.5}$ measurements are taken daily at UC Davis. Missing data were filled in by interpolation using data from the day immediately preceding and following the missing data point. These day-specific project background data were combined with contemporaneous modeled project impacts to evaluate compliance with the $PM_{2.5}$ AAQS for non-PSD purposes. The 98th percentile 24-hour concentration was calculated for each calendar year. The highest three-year average of 98th percentile concentrations was used to evaluate compliance with the 24-hour average $PM_{2.5}$ AAQS.

Table 5.1-23 presents the maximum concentrations of NO_x, CO, SO_2, PM_{10} and $PM_{2.5}$ recorded at nearby monitoring stations.

TABLE 5.1-23
Maximum Background Concentrations, 2005-2007 (μg/m^3)

Pollutant	Averaging Time	2005	2006	2007
NO_2 (Davis-UCD)	1-Hour	78	82	84
	annual	16	16	15
SO_2 (Vallejo)	1-Hour	28	40	51
	24-hour	13	10	10
	Annual	3	3	3
CO (Davis-UCD)	1-Hour	2,780	1,564	1,564
	8-Hour	1,703	1,199	973
PM_{10} (Vacaville)	24-Hour	35	60	39
	Annual	16.4	18.2	14.0
$PM_{2.5}$ (Davis-UCD)	24-Hour*	27.3	29.7	30.6
	Annual	—	8.0	8.8

*In accordance with the form of the standard, 24-hour $PM_{2.5}$ values are 98th percentile for the year.

Maximum ground-level impacts due to operation of the project are shown together with the ambient air quality standards in Table 5.1-24. Using the conservative assumptions described earlier, the results indicate that the project will not cause or contribute to violations of any state or federal air quality standards, with the exception of the state PM_{10}. State PM_{10} standards are already exceeded in the region. The project will mitigate its PM_{10} impacts by providing emission offsets to fully cover its PM_{10} emissions.

TABLE 5.1-24
Modeled Maximum Impacts from Facility

Pollutant	Averaging Time	Maximum Facility Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	State Standard ($\mu g/m^3$)	Federal Standard ($\mu g/m^3$)
NO_2	1-hour [a]	170.1	84	326	339	—
	Annual	2.3	16	18	57	100
SO_2	1-hour	12.9	51	64	655	—
	24-hour	3.6	13	17	105	365
	Annual	0.2	3	3	—	80
CO	1-hour	45.0	2,780	2,824	23,000	40,000
	8-hour	23.6	1,703	1,728	10,000	10,000
PM_{10}	24-hour	14.7	60	75	50	150
	Annual	3.6	18.2	22	20	—
$PM_{2.5}$	24-Hour	7.5	30.6	30.7[b]	—	35
	Annual	2.2	8.8	11	12	15

[a]Maximum 1-hour NO_2 impact shown occurs only during simultaneous startup of two turbines. Maximum impact during routine turbine operation will be approximately ? $\mu g/m^3$.

[b]See Table 5.1B-10, Appendix 5.1B, for calculation of 3-year average 98th percentile value.

PSD Increment Consumption

The PSD program was established to allow emission increases (increments of consumption) that do not result in significant deterioration of ambient air quality in areas where criteria pollutants have not exceeded the NAAQS. For the purposes of determining applicability of the PSD program requirements, the following regulatory procedure is used:

- Project facility-wide emissions are compared with regulatory significance thresholds to determine whether the facility is major and thus may be subject to PSD. If the facility emissions exceed these thresholds, it is a major facility. The comparison in Table 5.1-25 indicates that the CPVVS will be a major facility (for NO_x and CO) and, thus, is subject to PSD.
- If an ambient impact analysis is required, the analysis is first used to determine if the impact levels are significant. The determination of significance is based on whether the impacts exceed established significance levels shown in Table 5.1-26. If the significance levels are not exceeded, no further analysis is required.
- If the significance levels are exceeded, an analysis is required to demonstrate that the allowable increments will not be exceeded, on a pollutant-specific basis. Increments are the maximum increases in concentration that are allowed to occur above the baseline concentration. These PSD increments are also shown in Table 5.1-26.

Table 5.1-25 shows that the proposed project will be a major stationary source and will be subject to PSD review because facility emissions of NO_x and CO area above the 100-tpy major facility and the PSD significance thresholds.

TABLE 5.1-25
PSD Major Facility Levels

Pollutant	Facility Emissions (tpy)	PSD Threshold (tpy)	Major?
NO_x	157.7	100	Yes
SO_2	14.2	100	No
ROC	51.9	100	No
CO	203.4	100	Yes
PM_{10}*	79.0	100	No
$PM_{2.5}$*	73.7	100	No

*PM_{10} and $PM_{2.5}$ emissions shown include cooling tower.

TABLE 5.1-26
PSD Significant Impact levels and Consumption Increments

Pollutant	Averaging Time	Significant Impact Levels	Maximum Allowable Increments
NO_2	Annual	1 µg/m3	25 µg/m3
SO_2	3-hour	25 µg/m3	512 µg/m3
	24-Hour	5 µg/m3	91 µg/m3
	Annual	1 µg/m3	20 µg/m3
CO	1-Hour	2,000 µg/m3	N/A
	8-Hour	500 µg/m3	N/A
PM_{10}	24-Hour	5 µg/m3	30 µg/m3
	Annual	1 µg/m3	17 µg/m3

The maximum modeled impacts from the project are compared with the significance levels in Table 5.1-27. These comparisons show that NO2 and PM_{10} impacts from the proposed project will exceed the PSD significance thresholds.

TABLE 5.1-27
Comparison of Maximum Modeled Impacts and PSD Significance Thresholds

Pollutant	Averaging Time	Maximum Modeled Impacts ($\mu g/m^3$)	Significance Threshold ($\mu g/m^3$)	Significant?
NO_2	Annual	2.3	1	yes
SO_2	3-Hour	7.1	25	no
	24-Hour	3.6	5	no
	Annual	0.2	1	no
CO	1-Hour	1,019	2,000	no
	8-Hour	221	500	no
PM_{10}	24-Hour	14.7	5	yes
	Annual	3.6	1	yes
$PM_{2.5}$	24-Hour	7.5	N/A*	no
	Annual	2.2	N/A	no

*PSD significant impact level for PM2.5 has not been finalized by EPA.

Because the project impact exceeds PSD significance thresholds, this air quality impact analysis has been required to demonstrate that the project will not cause or contribute to a

violation of the federal ambient air quality standards for NO2 and PM10. Furthermore, as each of these pollutants will be fully offset by the applicant, there will be no consumption of PSD increment by the project.

5.1.4.5 Screening Health Risk Assessment

The screening health risk assessment (SHRA) was conducted to determine expected impacts on public health of the noncriteria pollutant emissions from the facility. The SHRA was conducted in accordance with the CAPCOA Air Toxics "Hot Spots" Program Risk Assessment Guidelines (October 1993). The SHRA estimated the offsite cancer risk to the maximally exposed individual (MEI), as well as indicated any adverse effects of noncarcinogenic compound emissions. The CARB/OEHHA Health Risk Assessment computer program was used to evaluate multipathway exposure to toxic substances. Because of the conservatism (overprediction) built into the established risk analysis methodology, the actual risks will be lower than those estimated.

A health risk assessment requires the following information:

- Unit risk factors (or carcinogenic potency values) for any carcinogenic substances that may be emitted
- Noncancer reference exposure levels (RELs) for determining noncarcinogenic health impacts
- 1-hour and annual average emission rates for each substance of concern
- The modeled maximum offsite concentration of each of the pollutants emitted

Pollutant-specific unit risk factors are the estimated probability of a person contracting cancer as a result of constant exposure to an ambient concentration of 1 $\mu g/m^3$ over a 70-year lifetime. The SHRA uses unit risk factors specified by the California Office of Environmental Health Hazard Assessment (OEHHA). The cancer risk for each pollutant emitted is the product of the unit risk factor and the modeled concentration. All of the pollutant cancer risks are assumed to be additive.

An evaluation of the potential noncancer health effects from long-term (chronic) and short-term (acute) exposures has also been included in the SHRA. Many of the carcinogenic compounds are also associated with noncancer health effects and are therefore included in the determination of both cancer and noncancer effects. RELs are used as indicators of potential adverse health effects. RELs are generally based on the most sensitive adverse health effect reported and are designed to protect the most sensitive individuals. However, exceeding the REL does not automatically indicate a health impact. The OEHHA reference exposure levels were used to determine any adverse health effects from noncarcinogenic compounds. A hazard index for each noncancer pollutant is then determined by the ratio of the pollutant annual average concentration to its respective REL for a chronic evaluation. The individual indices are summed to determine the overall hazard index for the project. Because noncancer compounds do not target the same system or organ, this sum is considered conservative. The same procedure is used for the acute evaluation.

The project SHRA results are compared with the established risk management procedures for the determination of acceptability. The established risk management criteria include those listed below:

- If the potential increased cancer risk is less than one in a million, the facility risk is considered not significant.
- If the potential increased cancer risk is greater than one in a million but less than ten in a million and Toxics-Best Available Control Technology (TBACT) has been applied to reduce risks, the facility risk is considered acceptable.
- If the potential increased cancer risk is greater than ten in a million and there are mitigating circumstances that, in the judgment of a regulatory agency, outweigh the risk, the risk is considered acceptable.
- For noncancer effects, total hazard indices of one or less are considered not significant.
- For a hazard index greater than one, OEHHA and the reviewing agency conduct a more refined review of the analysis and determine whether the impact is acceptable.

The SHRA includes the noncriteria pollutants listed above in Tables 5.1-18, 19, and 20. The receptor grid described earlier for criteria pollutant modeling was used for the SHRA. The SHRA results for the project are presented in Table 5.1-28, and the detailed calculations are provided in Public Health Section 5.9 of the AFC.

TABLE 5.1-28
Screening Health Risk Assessment Results

Cancer Risk to Maximally Exposed Individual:	3.0 in one million
Cancer Risk at Nearest Workplace:	0.7 in one million
Acute Inhalation Hazard Index:	0.11
Chronic Inhalation Hazard Index:	0.05

The screening HRA results indicate that the acute and chronic hazard indices are well below 1.0, so are not significant. The cancer risk to a maximally exposed individual is 3.0 in one million, and falls to below 1 in one million 700 meters from the facility. There are no existing residences with impacts greater than 1 in one million. Under the District's risk management program, the project will be required to utilize TBACT (in this case, use of natural gas as a fuel, the use of an oxidation catalyst on the turbines, and good combustion practices constitutes TBACT). The screening HRA results indicate that, overall, the CPVVS project will not pose an unacceptable health risk at any location.

5.1.4.6 Construction Impacts Analysis

Emissions during the construction phase of the project have been estimated, including an assessment of emissions from vehicle and equipment exhaust and the fugitive dust generated from material handling. A dispersion modeling analysis was conducted based on these emissions. A detailed analysis of the emissions and ambient impacts is included in Appendix 5.1D. The results of the analysis indicate that the maximum construction impacts will be below the state and federal standards for all the criteria pollutants emitted. The best

available emission control techniques will be used. The project construction impacts are not unusual in comparison to most construction sites; construction sites that use good dust suppression techniques and low-emitting vehicles typically do not cause violations of air quality standards.

5.1.5 Cumulative Effects

An analysis of potential cumulative air quality impacts that may result from the proposed combustion turbines and other reasonably foreseeable projects is generally required only when project impacts are significant.

To ensure that potential cumulative impacts of the project and other nearby projects are adequately considered, a cumulative impacts analysis will be conducted in accordance with the protocol included as Appendix 5.1G.

5.1.6 Mitigation Measures

Mitigation will be provided for all emissions increases from the project in the form of offsets and the installation of BACT, as required under YSAQMD regulations.

5.1.7 Laws, Ordinances, Regulations, and Standards

This section provides a detailed discussion of the LORS applicable to air quality.

5.1.7.1 Applicable LORS

5.1.7.1.1 Federal LORS

EPA has responsibility for enforcing, on a national basis, the requirements of many of the country's environmental and hazardous waste laws. California is under the jurisdiction of EPA Region IX, which has its offices in San Francisco. Region IX is responsible for the local administration of EPA programs for California, Arizona, Nevada, Hawaii, and certain Pacific trust territories. EPA's activities relative to the California air pollution control program focus principally on reviewing California's submittals for the State Implementation Plan (SIP). The SIP is required by the federal Clean Air Act to demonstrate how all areas of the state will meet the national ambient air quality standards within the federally specified deadlines (42 USC §7409, 7411).

Prevention of Significant Deterioration Program

Authority: Clean Air Act §160-169A, 42 USC §7470-7491; 40 CFR Parts 51 and 52

Requirements: Requires PSD review and facility permitting for construction of new or modified major stationary sources of air pollution. PSD review applies with respect to attainment pollutants for which ambient concentrations are lower than the corresponding NAAQS. The following federal requirements apply on a pollutant-by-pollutant basis, depending on facility emission rates.

- Emissions must be controlled using BACT.
- Air quality impacts in combination with other increment-consuming sources must not exceed maximum allowable incremental increases for SO_2, PM_{10}, and NO_x.

- Air quality impacts of all sources in the area plus ambient pollutant background levels cannot exceed NAAQS.
- Pre- and/or post-construction air quality monitoring may be required.
- The air quality impacts on soils, vegetation, and nearby PSD Class I areas (specific national parks and wilderness areas) must be evaluated. (Note: The CPVVS is located in a Class II area.)

PSD permits for YSAQMD major sources are issued by EPA Region IX. Since the proposed project is subject to PSD review, the applicant will need to seek a separate permit from EPA.

Administering Agency: EPA Region IX.

New Source Review
Authority: Clean Air Act §171-193, 42 USC §7501 et seq.; 40 CFR Parts 51 and 52

Requirement: Requires new source review (NSR) facility permitting for construction or modification of specified stationary sources. New source review applies with respect to nonattainment pollutants for which ambient concentration levels are higher than the corresponding NAAQS. The following federal requirements apply on a pollutant-by-pollutant basis, depending on facility emission rates.

- Emissions must be controlled to the lowest achievable emission rate (LAER).
- Sufficient offsetting emissions reductions must be obtained following the requirements in the regulations to continue reasonable further progress toward attainment of applicable NAAQS.
- The owner or operator of the new facility has demonstrated that major stationary sources owned or operated by the same entity in California are in compliance or on schedule for compliance with applicable emissions limitations in this rule.
- The administrator must find that the implementation plan has been adequately implemented.
- An analysis of alternatives must show that the benefits of the proposed source significantly outweigh any environmental and social costs.

New source review jurisdiction has been delegated to the YSAQMD for all pollutants and is discussed further under local LORS and conformance below.

Administering Agency: YSAQMD, with EPA Region IX oversight.

Acid Rain Program
Authority: Clean Air Act §401 (Title IV), 42 USC §7651

Requirement: Requires the reduction of the adverse effects of acid deposition through reductions in emissions of sulfur dioxide and nitrogen oxides. YSAQMD has received delegation authority to implement Title IV.

Administering Agency: YSAQMD, with EPA Region IX oversight.

Title V Operating Permits Program
Authority: Clean Air Act §501 (Title V), 42 USC §7661

Requirements: Establishes comprehensive operating permit program for major stationary sources. YSAQMD has received delegation authority for this program.

Administering Agency: YSAQMD, with EPA Region IX oversight.

National Standards of Performance for New Stationary Sources
Authority: Clean Air Act §111, 42 USC §7411; 40 CFR Part 60

Requirements: Establishes national standards of performance for new stationary sources. These standards are enforced at the local level with EPA oversight. Relevant new stationary source performance standards are discussed under local LORS below.

Administering Agency: YSAQMD, with EPA Region IX oversight.

National Emission Standards for Hazardous Air Pollutants
Authority: Clean Air Act §112, 42 USC §7412

Requirements: Establishes national emission standards for hazardous air pollutants. These standards are enforced at the local level with EPA oversight and are further discussed under local LORS and conformance below.

Administering Agency: YSAQMD, with EPA Region IX oversight.

5.1.7.1.2 State LORS

CARB was created in 1968 by the Mulford-Carrell Air Resources Act, through the merger of two other state agencies. CARB's primary responsibilities are to develop, adopt, implement, and enforce the state's motor vehicle pollution control program; to administer and coordinate the state's air pollution research program; to adopt and update as necessary the state's ambient air quality standards; to review the operations of the local air pollution control districts; and to review and coordinate preparation of the SIP for achievement of the federal ambient air quality standards (California Health & Safety Code [H&SC] §39500 et seq.).

- State Implementation Plan
- California Clean Air Act
- Toxic Air Contaminant Program
- Airborne Toxic Control Measure for Stationary Compression-Ignition Engines
- Nuisance Regulation
- Air Toxics "Hot Spots" Act
- CEC and ARB Memorandum of Understanding
- California Climate Change Regulatory Program

State Implementation Plan

Authority: Health & Safety Code (H&SC) §39500 et seq.

Purpose: Required by the federal Clean Air Act, the SIP must demonstrate the means by which all areas of the state will attain and maintain NAAQS within the federally mandated deadlines. The ARB reviews and coordinates preparation of the SIP. Local districts must adopt new rules (and/or revise existing rules) and demonstrate that the resulting emission reductions, in conjunction with reductions in mobile source emissions, will result in the attainment of NAAQS. The relevant YSAQMD Rules and Regulations that have also been incorporated into the SIP are discussed with the local LORS.

Administering Agency: YSAQMD, with ARB and USEPA Region 9 oversight.

California Clean Air Act

Authority: H&SC §40910 - 40930

Purpose: Established in 1989, the California Clean Air Act requires local districts to attain and maintain both national and state ambient air quality standards at the "earliest practicable date." Local districts must prepare air quality plans demonstrating the means by which the ambient air quality standards will be attained and maintained. The YSAQMD Air Quality Plan is discussed with the local LORS.

Administering Agency: YSAQMD, with ARB oversight.

Toxic Air Contaminant Program

Authority: H&SC §39650 - 39675

Purpose: Established in 1983, the Toxic Air Contaminant Identification and Control Act created a two-step process to identify toxic air contaminants and control their emissions. The ARB identifies and prioritizes the pollutants to be considered for identification as toxic air contaminants. The ARB also assesses the potential for human exposure to a substance, while the Office of Environmental Health Hazard Assessment (OEHHA) evaluates the corresponding health effects. Both agencies collaborate in the preparation of a risk assessment report, which concludes whether a substance poses a significant health risk and should be identified as a toxic air contaminant. In 1993, the Legislature amended the program to identify the 187 federal hazardous air pollutants[9] as toxic air contaminants. The ARB reviews the emission sources of an identified toxic air contaminant and, if necessary, develops air toxics control measures to reduce the emissions.

Airborne Toxic Control Measure for Stationary Compression-Ignition Engines

Authority: Title 17, California Code of Regulations, §93115

Requirements: Limits diesel particulate matter (DPM) and criteria pollutant eissions from stationary diesel-fueled compression ignition engines. The ATCM applies to stationary compression ignition engines with a rating greater than 50 brake horsepower. The ATCM requires use of CARB-certified diesel fuel or equivalent and limits emissions from, and operations of, compression ignition engines.

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[9] The USEPA increased the original list of 188 HAPs to 189, and then removed Caprolactam (61FR30816, June 18, 1996) and methyl ethyl ketone on December 19, 2005, reducing the list back to 187.

Administering Agency: YSAQMD and CARB

Nuisance Regulation
Authority: CA Health & Safety Code §41700

Requirements: Provides that "no person shall discharge from any source whatsoever such quantities of air contaminants or other material which causes injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property."

Administering Agency: YSAQMD and CARB

Toxic "Hot Spots" Act
Authority: H& SC §44300-44384; 17 CCR §93300-93347

Requirements: Requires preparation and biennial updating of inventory of facility emissions of hazardous substances listed by CARB, in accordance with CARB's regulatory guidelines. Risk assessments are to be prepared by facilities required to submit emissions inventories according to local priorities.

Administering Agency: YSAQMD and CARB

CEC and CARB Memorandum of Understanding
Authority: CA Pub. Res. Code §25523(a); 20 CCR §1752, 1752.5, 2300-2309 and Div. 2, Chap. 5, Art. 1, Appendix B, Part (k)

Requirements: Provides for the inclusion of requirements in the CEC's decision on an application for certification to assure protection of environmental quality; application is required to include information concerning air quality protection.

Administering Agency: California Energy Commission

California Climate Change Regulatory Program
Authority: Stats. 2006, Ch. 488 and CA Health & Safety Code § 38500-38599

Administering Agency: CARB.

5.1.7.1.3 Local LORS

When the state's air pollution statutes were reorganized in the mid-1960s, local air pollution control districts (APCDs) were required to be established in each county of the state (H&SC §4000 et seq.). There are three different types of districts: county, regional, and unified. In addition, special air quality management districts (AQMDs), with more comprehensive authority over non-vehicular sources as well as transportation and other regional planning responsibilities, have been established by the Legislature for several regions in California, (H&SC §40200 et seq.).

Air pollution control districts and air quality management districts in California have principal responsibility for:

- Developing plans for meeting the state and federal ambient air quality standard;

- Developing control measures for non-vehicular sources of air pollution necessary to achieve and maintain both state and federal air quality standards;
- Implementing permit programs established for the construction, modification, and operation of sources of air pollution; and
- Enforcing air pollution statutes and regulations governing non-vehicular sources; and for developing employer-based trip reduction programs.

Each level of government has adopted specific regulations that limit emissions from stationary combustion sources, several of which are applicable to this project. An application for a Determination of Compliance will be filed with YSAQMD at approximately the same time as the Application for Certification (AFC) is filed with the Commission.

District Regulations and Policies

Authority: CA Health & Safety Code §40001

Requirements: Prohibit emissions and other discharges (such as smoke and odors) from specific sources of air pollution in excess of specified levels.

Administering Agency: YSAQMD, with CARB oversight.

5.1.7.2 Conformance of Facility

As addressed in this section, CPVVS is designed, and will be constructed and operated, in accordance with all relevant federal, state, and local requirements and policies concerning protection of air quality.

5.1.7.2.1 Federal Prevention of Significant Deterioration Program

EPA has promulgated PSD regulations for areas that are in compliance with national ambient air quality standards (40 CFR 52.21). The PSD program allows new sources of air pollution to be constructed, or existing sources to be modified, while preserving the existing ambient air quality levels, protecting public health and welfare, and protecting Class I areas (e.g., specific national parks and wilderness areas). Although EPA had delegated the authority to implement the PSD program to various California air pollution control districts, including the YSAQMD where CPVVS is located (40 CFR 52.21[u]), that delegation was rescinded on March 3, 2003, and PSD permits within YSAQMD are now issued by EPA Region IX.

The five principal areas of the federal PSD program are as follows:

- Applicability
- BACT
- Pre-construction monitoring
- Increments analysis
- Air quality impact analysis

The PSD requirements apply on a pollutant-specific basis to any project that is a new major stationary source or a major modification to an existing stationary source. (These terms are defined in federal regulations 40 CFR 52.21.) The determination of applicability is based on evaluating the emissions changes associated with the proposed project in addition to all

other emissions changes at the same location since the applicable PSD baseline dates (40 CFR 52.21).

The PSD program applies, on a pollutant-specific basis, only to a new major stationary source or to a major modification of an existing major stationary source that meets the following criteria:

- A new facility that will emit 100 tpy or more, and is one of the 28 PSD source categories in the federal Clean Air Act or any new facility that will emit 250 tpy or more; or
- A new or modified major facility with net emissions increases since the applicable PSD baseline date that exceed the significant emissions threshold levels.

The CPVVS is one of the 28 PSD source categories. The potential to emit for NO_x and CO each exceeds 100 tpy. As a result, the CPVVS is a new major stationary source under PSD.

For new major sources, PSD review also applies to any other pollutants that are emitted in quantities greater than or equal to PSD significance thresholds. In addition to NO_x and CO, emissions of ROC, PM_{10}, and $PM_{2.5}$ exceed the significant emissions levels. Therefore, PSD review applies to NO_x, CO, ROC, PM_{10}, and $PM_{2.5}$.

5.1.7.2.2 Federal New Source Performance Standards

The Standards of Performance for New Stationary Sources are source-specific federal regulations, limiting the allowable emissions of criteria pollutants (i.e., those that have a national ambient air quality standard). These regulations apply to certain sources depending on the equipment size, process rate, and/or the date of construction, modification, or reconstruction of the affected facility. Recordkeeping, reporting, and monitoring requirements are usually necessary for the regulated pollutants from each subject source; the reports must be regularly submitted to the reviewing agency (40 CFR 60.4). This program has been delegated by EPA to the YSAQMD.

Subpart KKKK (Standards of Performance for Stationary Gas Turbines) applies to combustion turbines with a heat input at peak load equal to or greater than 10.7 gigajoules per hour (Gj/hr) (10.15 MMBtu/hr) at higher heating value. The project combustion turbines have an hourly heat input that exceeds this threshold.

The NO_x standard that applies to a new turbine firing natural gas, with a heat input at peak load that exceeds 850 MMBth/hr (HHV) is 15 ppm at 15% O_2. The turbines, which will be designed to meet a NO_x BACT level of 2 ppm, will easily comply with the NSPS standard.

Subpart Dc (Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units) applies to boilers with a capacity of 10 MMBtu per hr or greater that generate steam . The auxiliary boiler has a capacity of 37 MMBtu per hr, and is therefore subject to Subpart Dc. The natural gas-fired auxiliary boiler will easily comply with the SO_2 and PM_{10} limits of the applicable NSPS.

The proposed emergency generator and diesel fire pump engine are subject to the requirements of Subpart IIIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. For engines of the sizes proposed for this project, the NSPS requires facilities to purchase engines meeting the EPA engine non-road certification

level of Tier II or better depending on the year the engine is manufactured/purchased. This regulation also requires the engines to use ultra-low sulfur diesel fuel.

5.1.7.2.3 National Emissions Standards for Hazardous Air Pollutants

The National Emissions Standards for Hazardous Air Pollutants (NESHAPs) are either source-specific or pollutant-specific regulations, limiting the allowable emissions of hazardous air pollutants from the affected sources (40 CFR 61). Unlike criteria air pollutants, hazardous air pollutants do not have a national ambient air quality standard but have been identified by EPA as causing or contributing to the adverse health effects of air pollution.

40 CFR 63 Subpart YYYY—National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Sources applies to turbines that are located at major sources of HAP emissions. A facility is a major source of HAPs if it emits more than 10 tpy of a single HAP, or 25 tpy combined of all HAPs. As shown in Table 5.1-17, the facility's emissions of HAPs will be below the applicable thresholds; therefore, Subpart YYYY does not apply to this facility.

40 CFR 63 Subpart ZZZZ—National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines applies to reciprocating engines that are located at major sources of HAP emissions. Because the facility is not a major source of HAP emissions, the NESHAP does not apply.

5.1.7.2.4 Federal Clean Air Act Amendments of 1990

In November 1990, substantial revisions and updates to the federal Clean Air Act were signed into law. This complex enactment addresses a number of areas that could be relevant to the proposed project, such as State Implementation Plan requirements for nonattainment areas that set new compliance deadlines and annual progress increments, more extensive permitting requirements, new EPA mandates and deadlines for developing rules to control air toxic emissions, and acid deposition control. Following is a summary of the new provisions applicable to this project.

Title IV—Acid Deposition Control

This title requires the reduction of emissions of acidic compounds and their precursors (42 USC §7651 et seq.). The principal source of these compounds is the combustion of fossil fuels. Other requirements include monitoring and recordkeeping for emissions of SO_2 and NO_x and for opacity and volumetric flow.

Title V—Operating Permits

This title establishes a comprehensive operating permit program for major stationary sources (42 USC §7661 et seq.). Under the Title V program, a single permit is required that includes a listing of all the stationary sources, applicable regulations, requirements, and compliance determination.

YSAQMD's Federal Operating Permits Program (Rule 3.8) has been approved by EPA and includes the acid rain program. Consequently, YSAQMD has received delegation to implement the Title IV and V programs. The District Title IV and V permit programs applicable to this project are summarized below.

5.1.7.2.5 California Clean Air Act

AB 2595, the California Clean Air Act, was enacted by the California Legislature and became law in January 1989. It requires the local air pollution control districts to attain and maintain both the federal and state ambient air quality standards at the "earliest practicable date." The California Clean Air Act contains several milestones for local districts and the CARB. In compliance with the California Clean Air Act, YSAQMD prepared the 1992 Air Quality Attainment Plan to address the nonattainment status for ozone.

Air quality plans must demonstrate attainment of the state ambient air quality standards and must result in a five percent annual reduction in emissions of nonattainment pollutants (ozone, CO, NO_x, SO_2, and their precursors) in a given district (H&SC §40914). A local district may adopt additional stationary source control measures or transportation control measures, revise existing source-specific or new source review rules, or expand its vehicle inspection and maintenance program (H&SC §40918) as part of the plan. District air quality plans specify the development and adoption of more stringent regulations to achieve the requirements of the California Clean Air Act. The applicable regulations that will apply to the project are included in the discussion of YSAQMD prohibitory rules in Section 5.1.7.2.9.

5.1.7.2.6 Airborne Toxic Control Measure for Stationary Compression Ignition Engines

In 2004, CARB adopted an ATCM[10] to reduce DPM and criteria pollutant emissions from stationary diesel-fueled compression ignition engines. The ATCM categorizes stationary diesel engines as either new or in-use, and as either prime or emergency. New emergency engines must meet a DPM emission limit of 0.15 g/bhp-hr upon installation. The emergency generator and diesel fire pump engine are subject to the ATCM requirements for new emergency engines. As required by the ATCM, PM emissions from each new unit will not exceed 0.15 gm/hp-hr, and each reciprocating engine will be limited to 50 hours of operation on liquid fuel per year for testing and maintenance purposes.

5.1.7.2.7 California Climate Change Program

The State of California adopted the Global Warming Solutions Act of 2006 (Assembly Bill [AB] 32) on September 27, 2006, which requires sources within the state to reduce carbon emissions by approximately 25% by the year 2020. The California Climate Action Registry has published protocols for voluntary reporting of GHG emissions from a number of sectors of the economy, and CARB is considering regulations to limit GHG emissions from electric power plants and other specific source categories. In addition, CARB has issued regulations governing the calculation of GHG emissions from power plants, among other source categories.

AB 32 also sets the following milestone dates for CARB to take specific actions:

- June 30, 2007: Identify a list of discrete early action GHG emission reduction measures (first report published April 20, 2007, with additional measures adopted on October 25, 2007).
- January 1, 2008: Establish a statewide GHG emission cap for 2020 that is equivalent to 1990 emissions.
- January 1, 2008: Adopt mandatory reporting rules for significant sources of GHGs.

[10] CCR Title 17, Section 93115.

- January 1, 2009: Adopt a scoping plan that will indicate how GHG emission reductions will be achieved from significant GHG sources through regulations, market-based compliance mechanisms, and other actions, including recommendation of a de minimis threshold for GHG emissions, below which sources would be exempt from reduction requirements.
- January 1, 2011: Adopt regulations to achieve maximum technologically feasible and cost-effective GHG emission reductions, including provisions for both market-based and alternative compliance mechanisms.
- January 1, 2012: Regulations adopted prior to January 1, 2010, become effective.

Senate Bill (SB) 97, adopted August 21, 2007, requires the California Office of Planning and Research (OPR) to develop CEQA guidelines "for the mitigation of GHG emissions or the effects of GHG emissions" by July 1, 2009. SB 97 further requires the Resources Agency Secretary to adopt these CEQA guidelines by January 1, 2010. Finally, SB 97 removes GHG emissions as a cause of action under CEQA for specified state-financed infrastructure projects until January 1, 2010.

CARB has adopted a mandatory GHG emissions reporting regulation which will apply to the Project. Under that regulation, the facility will be required to submit reports quantifying its emissions of GHGs.

CARB will also adopt regulations limiting emissions of GHGs from specific source categories, including fossil-fuel-fired power plants.

The Project will comply with all applicable reporting and control requirements.

5.1.7.2.8 YSAQMD New Source Review Requirements

YSAQMD Rule 3.4, New Source Review, requires that a pre-construction review be conducted for all proposed new or modified sources of air pollution. NSR contains three principal elements:

- BACT
- Emissions offsets
- Air quality impact analysis

BACT is required for any source for each emissions increase of an affected pollutant for which the source's potential to emit exceeds specified levels. The specified levels are 10 lb/day for reactive organic compounds and nitrogen oxides, 80 lb/day for sulfur oxides and PM_{10}, 250 lb/day for carbon monoxide, and 3.3 lb/day for lead.

The regulation further requires that the applicant provide emission offsets for pollutants that exceed 7,500 lb/quarter (ROCs and NO_x), 13,650 lb/quarter (SO_x and PM_{10}), or 49,500 lb/quarter (CO).

District Regulation 3-4 Section 418 specifies procedures for review of power plants within the district. YSAQMD will prepare a Determination of Compliance based on the information contained in the Application for Certification. YSAQMD has the authority to request additional information from the applicant in order to complete its review.

5.1.7.2.9 YSAQMD Toxics New Source Review Rule

Regulation 3-13 requires the installation of (T-BACT) at any constructed or reconstructed major source of hazardous air pollutants. A major source of HAPs is a facility that has the potential to emit 10 tpy of a single HAP, or combined emissions of 25 tpy of HAPs.

5.1.7.2.10 Other District Regulatory Requirements

As required by the federal Clean Air Act and the California Clean Air Act, plans that demonstrate attainment must be developed for those areas that have not attained the national and state air quality standards (42 USC §7401; H&SC §40912). As part of its plan, YSAQMD has developed regulations limiting emissions from specific sources. These regulations are collectively known as "prohibitory rules," because they prohibit the construction or operation of a source of pollution that would violate specific emission limits.

The general prohibitory rules of YSAQMD applicable to the project are as follows.

Rule 2.3—Ringelmann Chart

Limits the visible emissions from the project to no darker than No. 2 when compared to a Ringelmann Chart for a period or periods aggregating more than 3 minutes in any hour. Opacity is limited to an equivalent level. Rule 2-7 exempts wet plumes from the limits of Rule 2.3.

Rule 2.5—Nuisance

Prohibits emissions in quantities that adversely affect public health, other businesses, or property.

Rule 2.11—Particulate Matter

Particulate emission concentrations cannot exceed 0.3 grains per dry standard cubic foot of exhaust gas volume.

Rule 2.12—Specific Contaminants

Limits stationary source emissions of sulfur dioxide to less than 0.2 percent. Limits particulate matter from combustion processes to 0.3 grains per cubic foot.

Rule 2.16—Fuel Burning Heat or Power Generators

Limits emissions from burning equipment to 200 pounds per out of sulfur compounds, 140 pounds per hour of NO_x, and 40 pounds per hour of combustion particulate.

Rule 2.27—Industrial, Institutional, and Commercial Boilers, Steam Generators and Process Heaters

Limits nitrogen oxide emissions from the auxiliary boiler to 30 ppmv.

Rule 2.32—Stationary Internal Combustion Engines

Limits nitrogen oxide emissions to 9.5 gm/hp-hr and carbon monoxide to 2,000 ppmv.

Rule 2.34—Stationary Gas Turbines

Limits nitrogen oxide emissions to a level that is based on the efficiency of the turbine (36 ppm times the turbine efficiency [expressed as a fraction]).

Rule 9.3—Hexavalent Chromium

Limits hexavalent chromium emissions from cooling towers by eliminating the use of chromium-based chemicals.

5.1.7.2.11 District Title IV and Title V Programs

YSAQMD Rule 3.8—Federal Operating Permits

This rule implements the operating permit requirements of Title V of the federal Clean Air Act. The rule applies to major facilities, Phase II acid rain facilities, subject solid waste incinerator facilities, and any facility listed by EPA as requiring a Title V permit. As a Phase II acid rain facility, the CPVVS will be required to submit a permit application to undergo a major facility review within 12 months of commencement of facility operation.

YSAQMD has adopted by reference the federal Title IV (Acid Rain) Regulation and is now responsible for implementing the program through the Title V operating permit program. Under Title IV, a project must comply with maximum operating emissions levels for SO_2 and NO_x and is required to install and operate continuous monitoring systems for SO_2, NO_x, and CO_2 emissions. Extensive recordkeeping and reporting requirements are also part of the acid rain program.

All applicable LORS are summarized in Table 5.1-29.

5.1.7.3 Consistency with LORS

5.1.7.3.1 Consistency with Federal LORS

YSAQMD has been delegated authority by the EPA to implement and enforce most federal requirements that may be applicable to the project, including the new source performance standards and new source review for nonattainment pollutants. Compliance with the YSAQMD regulations ensures compliance and consistency with the corresponding federal requirements as well. The project will also be required to comply with the Federal Acid Rain requirements (Title IV). Since YSAQMD has received delegation for implementing Title IV through its Title V permit program, the CPVVS will secure a district Title V permit that imposes the necessary requirements for compliance with the Title IV Acid Rain provisions.

As discussed in AFC Section 5.1.7.2, the federal PSD program requirements apply on a pollutant-specific basis to:

- A new major facility that will emit 100 tpy or more, or a major modification to an existing major facility.
- A facility that emits 100 tpy or more, with net emissions increases since the applicable PSD baseline date that exceed the PSD threshold levels.

The CPVVS will be a major source for NO_x and CO. Additionally, ROC, PM_{10}, and $PM_{2.5}$ emissions exceed PSD threshold levels, and are also subject to PSD review. An application for a federal PSD permit will be submitted to EPA.

TABLE 5.1-29
Laws, Ordinances, Regulations, Standards and Permits for Protection of Air Quality

LORS	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	Conformance (Section)
Federal					
Clean Air Act (CAA) §160-169A and implementing regulations, Title 42 United States Code (USC) §7470-7491 (42 USC 7470-7491), Title 40 CFR Parts 51 & 52 (40 CFR 51 & 52) (Prevention of Significant Deterioration Program)	Requires PSD review and facility permitting for construction of new or modified major stationary sources of air pollution. PSD review applies to pollutants for which ambient concentrations are lower than NAAQS.	EPA	After project review, issues PSD permit with conditions limiting emissions.	Agency approval to be obtained before start of construction.	5.1.7.1.1 (p. 35); 5.1.7.2.1 (p 40) 5.1.7.3.1 (p. 49) , Appendix 5.1E
CAA §171-193, 42 USC §7501 et seq. (New Source Review)	Requires NSR facility permitting for construction or modification of specified stationary sources. NSR applies to pollutants for which ambient concentration levels are higher than NAAQS.	YSAQMD with EPA oversight	After project review, issues Determination of Compliance (DOC) with conditions limiting emissions.	Agency approval to be obtained before start of construction.	5.1.7.1.1 (p. 35); 5.1.7.3.1 (p. 49) , Appendix 5.1E
CAA §401 (Title IV), 42 USC §7651 (Acid Rain Program)	Requires reductions in NO_x and SO_2 emissions.	YSAQMD with EPA oversight	Issues Acid Rain permit after review of application.	Application to be made within 12 months of start of facility operation.	5.1.7.1.1 (p. 36); 5.1.7.3.3 (p.62)
CAA §501 (Title V), 42 USC §7661 (Federal Operating Permits Program)	Establishes comprehensive permit program for major stationary sources.	YSAQMD with EPA oversight	Issues Title V permit after review of application.	Application to be made within 12 months of start of facility operation.	5.1.7.1.1 (p. 36); 5.1.7.3.3 (p.62)
5.1CAA §111, 42 USC §7411, 40 CFR Part 60 (New Source Performance Standards)	Establishes national standards of performance for new stationary sources.	YSAQMD with EPA oversight	After project review, issues DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	5.1.7.1.1 (p. 36); 5.1.7.2.2 (p. 41)
CAA §112, 42 USC §7412, 40 CFR Part 63 (NESHAPs)	Establishes national emission standards for hazardous air pollutants.	YSAQMD with EPA oversight	After project review, issues DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	5.1.7.1.1 (p. 37); 5.1.7.2.2 (p. 41)

TABLE 5.1-29
Laws, Ordinances, Regulations, Standards and Permits for Protection of Air Quality

LORS	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	Conformance (Section)
State					
California H&SC §41700 (Nuisance Regulation)	Outlaws discharge of such quantities of air contaminants that cause injury, detriment, nuisance, or annoyance.	YSAQMD with CARB oversight	After project review, issues DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	5.1.7.3.3 (p. 53)
H&SC §44300-44384; California Code of Regulations (CCR) §93300-93347 (Toxic "Hot Spots" Act)	Requires preparation and biennial updating of facility emission inventory of hazardous substances; risk assessments.	YSAQMD with CARB oversight	After project review, issues DOC with conditions limiting emissions.	Screening HRA submitted before start of construction.	5.1.4.4, 5.1.7.1.2, Appendix 5.1C
California Public Resources Code §25523(a); 20 CCR §1752, 2300-2309 (CEC & CARB Memorandum of Understanding)	Requires that CEC's decision on AFC include requirements to assure protection of environmental quality; AFC required to address air quality protection.	CEC	After project review, issues license with conditions limiting emissions.	CEC approval of AFC, i.e., FDOC, to be obtained before start of construction.	5.1.7.1.2 (p. 37);
Local					
YSAQMD Rule 2.5—Nuisance	Prohibits emissions in quantities that adversely affect public health, other businesses, or property.	YSAQMD with CARB oversight	After project review, issues DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	5.1.7.3.3 (p. 53)
YSAQMD Rule 3.4 (New Source Review	NSR and PSD: Requires that preconstruction review be conducted for all proposed new or modified sources of air pollution, including BACT, emissions offsets, and air quality impact analysis.	YSAQMD with CARB oversight	After project review, issues DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	5.1.7.3.3 (p. 49); Appendix 5.1E
YSAQMD Rule 3-13 (Toxics New Source Review)	Requires installation of Toxics Best Available Technology at new major sources of HAPs	YSAQMD with CARB oversight	After project review, issues DOC with conditions limiting emissions	Agency approval to be obtained before start of construction.	5.1.4.5 (p. 32); Section 5.9; Appendix 5.1C
YSAQMD Rule 3-8	Implements operating permits requirements of CAA Title V and acid rain regulations of CAA Title IV.	YSAQMD with EPA oversight	Issues Title V permit after review of application.	Application to be made within 12 months of start of facility operation.	5.1.7.1.1 (p. 36); 5.1.7.3.3 (p.62)
YSAQMD Rule 2.3 (Ringelmann Chart)	Limits visible emissions to no darker than Ringelmann No. 2 for periods greater than 3 minutes in any hour	YSAQMD with CARB oversight	After project review, issues DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	5.1.7.3.3 (p. 53)

TABLE 5.1-29
Laws, Ordinances, Regulations, Standards and Permits for Protection of Air Quality

LORS	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	Conformance (Section)
YSAQMD Rule 2.11 (Particulate Matter)	Limits emissions of particulate matter to 0.3 grains per dry standard cubic foot	YSAQMD with CARB oversight	After project review, issues DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	5.1.7.3.3 (p. 53)
YSAQMD Rule 2.12 (Specific Contaminants)	Limits SO_2 emissions to <0.2 percent; also limits particulate matter from combustion to 0.3 gr/cu foot	YSAQMD with CARB oversight	After project review, issues DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	5.1.7.3.3 (p. 53)
YSAQMD Rule 2.16 (Fuel Burning Heat or Power Generators)	Limits emissions of criteria pollutants from burning equipment	YSAQMD with CARB oversight	After project review, issues DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	5.1.7.3.3 (p. 53)
YSAQMD Rule 2.27 (Industrial, Institutional, and Commercial Boilers, Steam Generators and Process Heaters)	Limits nitrogen oxide emissions from the auxiliary boiler to 30 ppmv	YSAQMD with CARB oversight	After project review, issues DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	5.1.7.3.3 (p. 53)
YSAQMD Rule 2.32 (Stationary Internal Combustion Engines)	Limits nitrogen oxide emissions to 9.5 gm/hp-hr and carbon monoxide to 2,000 ppmv	YSAQMD with CARB oversight	After project review, issues DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	5.1.7.3.3 (p. 53)
YSAQMD Rule 2.34 (Stationary Gas Turbines)	Limits emissions of nitrogen oxides	YSAQMD with CARB oversight	After project review, issues DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	5.1.7.3.3 (p. 53)
YSAQMD Rule 9.3 (Hexavalent Chromium)	Prohibits use of chromium-based chemicals in cooling towers.	YSAQMD with CARB oversight	After project review, issues DOC with conditions limiting emissions.	Agency approval to be obtained before start of construction.	5.1.7.3.3 (p. 53)

5.1.7.3.2 Consistency with State LORS

State law sets up local air pollution control districts and air quality management districts with the principal responsibility for regulating emissions from stationary sources. As discussed above, the project is under the local jurisdiction of YSAQMD, and compliance with district regulations will ensure compliance with state air quality requirements.

5.1.7.3.3 Consistency with Local LORS

YSAQMD has been delegated responsibility for implementing local, state, and federal air quality regulations in the county where the project is located. The project is subject to YSAQMD regulations that apply to new sources of emissions, to the prohibitory regulations that specify emission standards for individual equipment categories, and to the requirements for evaluation of impacts from toxic air pollutants. The following sections include the evaluation of facility compliance with the applicable YSAQMD requirements.

Under the regulations that govern new sources of emissions, the project is required to secure a preconstruction Determination of Compliance from YSAQMD (Rule 3.4), as well as demonstrate continued compliance with regulatory limits when the facility becomes operational. The preconstruction review includes demonstrating that the combustion turbines will use BACT and will provide any necessary emission offsets.

Applicable BACT levels are shown in Table 5.1-30, along with anticipated potential facility emissions. BACT is required for any source for each emissions increase of an affected pollutant for which the source's potential to emit exceeds specified levels.

As shown in the table, BACT is required for NO_x, ROC, SO_2, CO, and PM_{10}. The calculation of facility emissions was discussed in Section 5.1.4.1.1.

TABLE 5.1-30
Facility Best Available Control Technology Requirements

Pollutant	Applicability Level	Facility Emission Level (lbs/day)	BACT Required?
District Rule 3.4 Section 301			
ROC	10 lbs/day	496.7	yes
NO_x	10 lbs/day	1460.6	yes
SO_2	80 lbs/day	343.7	yes
PM_{10}	80 lbs/day	406.9	yes
CO	250 lbs/day	2,766.7	yes
Lead	3.2 lbs/day	neg.	no

Since the YSAQMD does not maintain a BACT database, BACT for the applicable pollutants was determined by reviewing the Bay Area Air Quality Management District BACT Guidelines Manual, the South Coast Air Quality Management District BACT Guidelines Manual, the most recent Compilation of California BACT Determinations, CAPCOA (2nd Ed., November 1993), and EPA's BACT/LAER Clearinghouse. A summary of the review is provided in Appendix 5.1E. For the combustion turbines, YSAQMD considers BACT to be

the most stringent level of demonstrated emission control that is feasible. The project will use the BACT measures discussed below.

As a BACT measure, the project will limit the fuels burned in the new combustion turbines and duct burners to natural gas, a clean burning fuel. Burning of liquid fuels in the combustion turbine combustors would result in greater criteria pollutant emissions than if the units burned only gaseous fuels. This measure acts to minimize the formation of all criteria air pollutants.

BACT for NO_x emissions from the combustion turbines will be the use of low-NO_x-emitting equipment and add-on controls. The project will use an SCR system to reduce NO_x emissions to 2.0 ppmvd NO_x, corrected to 15% O_2 on a 1-hour average basis. Current BACT from large, combined-cycle combustion turbines (≥40 MMBtu/hr heat input) is an exhaust concentration of 2.0 ppmvd NO_x, corrected to 15% O_2; therefore, the proposed combustion turbines will meet the BACT requirements for NO_x.

BACT for CO emissions will be achieved by using oxidation catalysts to reduce CO emissions to 3.0 ppmvd, corrected to 15% O_2. Current BACT from large, combined-cycle combustion turbines (≥40 MMBtu/hr heat input) is an exhaust concentration of 3 ppmvd CO, corrected to 15% O_2. A review of recent BACT determinations for CO from combustion turbines is provided in Appendix 5.1E.

BACT for ROC emissions will be achieved by use of good combustion practices in the combustion turbines. BACT for ROC emissions from combustion devices has historically been the use of best combustion practices. ROC emissions leaving the stacks will not exceed 2.0 ppmvd corrected to 15% O_2. This level of emissions is consistent with recent BACT determinations for similar projects.[11]

For the turbines, BACT for SO_2 and PM_{10} is best combustion practices and the use of gaseous fuels. Current BACT from large, combined-cycle combustion turbines (≥40 MMBtu/hr heat input) is the exclusive use of clean-burning natural gas with a sulfur content of < 1.0 grains per 100 scf. The proposed turbines will burn exclusively PUC-regulated natural gas with an expected average sulfur content of 0.25 grains per 100 scf, which will result in minimal SO_2 emissions.

For the auxiliary boiler, BACT for NO_x is use of low-NO_x burners. The system will be designed to meet a NO_x limit of 9 ppm, corrected to 3% O_2, at all times. BACT for CO and ROC emissions will be achieved by use of good combustion practices. BACT for SO_2 and PM_{10} is best combustion practices and the use of gaseous fuels.

BACT for PM_{10} and $PM_{2.5}$ from the cooling tower is the use of high-efficiency drift eliminators. The cooling tower will be designed to achieve a drift rate of 0.0005% or less.

BACT for all pollutants from the emergency engines is the use of the highest tier engines available for the service.

In addition to the BACT requirements, District rule 3.4 Section 302 requires the project to provide full emission offsets when emissions exceed specified levels on a pollutant-specific basis. As shown in Table 5.1-31, the project will be required to provide emission offsets for NO_x emissions.

[11] Although the turbines will be equipped with oxidation catalysts, no ROC control effectiveness has been assumed.

TABLE 5.1-31
Yolo-Solano AQMD Offset requirements

Pollutant	Emission Increase	Facility Emissions	Offsets Required
ROC	7,500 lb/qtr	24,000 lb/qtr	Yes
NO_x	7,500 lb/qtr	78,000 lb/qtr	Yes
PM_{10}	13,650 lb/qtr	45,000 lb/qtr	Yes
SO_2	13,650 lb/qtr	7,000 lb/qtr	No
CO	49,500 lb/qtr	101,000 lb/qtr	Yes

Rule 302.3 requires that offsets be provided on a quarterly basis. Rule 302.7 and 302.8 allow NO_x and ROC offsets from Qtr 2 and Qtr 3 to be used to offset increases in Qtr 1 and Qtr 4. This policy allows reductions of ozone precursors during the ozone season to offset increases during the winter and spring, when cooler, windier conditions result in ozone formation not being a concern.

As facility emissions of SO_2 will be below 13,650 lb/qtr, offsets are not required for this pollutant. As shown in Table 5.1-31, the maximum SO_2 impacts from the proposed project are well below the significance thresholds so are not considered significant, and no mitigation is necessary under YSAQMD rules.

Emissions offset requirements for NO_x, ROC, PM_{10}, and CO are shown in Table 5.1-32. Sufficient offsets are available from purchase options being pursued by the project, through the YSAQMD offset emissions bank, and through sources that have not banked emissions with the YSAQMD, such as facility closures. The YSAQMD offset bank listing provides the required information for offset identification and assessment of the emission reduction levels achieved. The information includes:

- Ownership of emission offset sources; and
- Emission reduction credits granted by YSAQMD that YSAQMD has determined meets its requirements for bankable offsets.

TABLE 5.1-32
Facility Offset Requirements

Pollutant	Net Increase in Emissions (tpy)	Required Offset Ratio[a]	Offsets Required (tpy)	ERCs available in YSAQMD bank[b]
NO_x	158	1.5:1	237	164
ROC	52	1.5:1	78	277
PM_{10}	79	1.5:1	119	404
CO	203	1.5:1	305	1,388

[a]Estimate. Actual offset ratio will depend on distance of source of offsets from project site.

[b]Total ERCs Available in YSAQMD from Appendix 5.1F

A current listing of deposits in the offset bank is included in Appendix 5.1F. The applicant has initiated negotiations with individual ERC holders to obtain sufficient ERCs to meet the offset requirements for this project. Table 5.1-32 shows the ERCs that are registered with YSAQMD and demonstrates that there are sufficient ERCs from local sources to provide the offsets needed for the project for all pollutants except NOx. However, District regulations permit the use of interpollutant offsets, if appropriate demonstrations are made. In this case, ROC offsets may be offered in lieu of NOx. Similar offset proposals within the air basin have been approved at offset ratios of 1.4 to one. There are sufficient ROC offsets in the bank to make up the shortfall of NOx at this ratio.

Regulation 3-13 requires the installation of T-BACT at any constructed or reconstructed major source of hazardous air pollutants. A major source of HAPs is a facility that has the potential to emit 10 tpy of a single HAP, or combined emissions of 25 tpy of HAPs. As shown in Table 5.1-17, the facility's emissions of HAPs will be below the applicable thresholds.

Rule 3.8, Federal Operating Permits (Title V permit program), applies to major facilities and phase II acid rain facilities. The project is both a major facility and a phase II acid rain facility. Under the Title V permit program, the CPVVS will be required to file an application for an operating permit within 12 months of facility startup. The Phase II acid rain requirements will also apply to the CPVVS. As a Phase II Acid Rain facility, the CPVVS will be required to provide sufficient allowances for every ton of SO_2 emitted during a calendar year. The CPVVS will obtain the necessary allowances on the current open trade market. The CPVVS will also be required to install and operate continuous monitoring systems; YSAQMD enforcement of its rules will ensure installation of these systems.

The general prohibitory rules of YSAQMD applicable to the proposed project and the determination of compliance follow.

Rule 2.3 pertains to visible emissions. Any visible emissions from the project will not be darker than No. 2 when compared to a Ringlemann Chart for any period(s) aggregating 3 minutes in any hour. Because the new turbines will burn clean fuels, the opacity standard of not greater than 20 percent for a period or periods aggregating 3 minutes in any hour and the particulate emission concentrations limit of 0.15 grains per standard cubic feet of exhaust gas volume will not be exceeded. The cooling tower's wet plume will not be subject to the opacity standard. The new emergency engine and fire pump engine will be Tier 2 or better, and are expected to comply with visible emission requirements.

Rule 2.5 addresses Public Nuisance. The new facility will emit insignificant quantities of odorous or visible substances; therefore, the project will comply with this regulation.

Rule 2.11 limits particulate concentrations to 0.3 grains per dry standard cubic foot. Because the new turbines will burn clean fuels, they are expected to comply with this requirement. Initial source testing will confirm compliance. Modern new engines are designed to achieve very low particulate emissions, well below the standard.

Rule 2.12 limits stationary source emissions of sulfur dioxide to less than 0.2 percent. Limits particulate matter from combustion processes to 0.3 grains per cubic foot. Use of natural gas as a fuel (and CARB low sulfur diesel in emergency engines) ensures compliance with this requirement.

Rule 2.16 imposes a maximum hourly emission limit of 200 lb/hr of sulfur compounds, 140 lb/hour of nitrogen oxides, and 40 lb/hr of combustion particulates. The project will meet these limits.

Rule 2.27 limits the NOx emissions from the auxiliary boiler to 30 ppm. The boiler, designed to meet a BACT level of 9 ppm, will comply.

Rule 2.32 limits NO_x emissions from stationary internal combustion engines to 9.5 gm/hp-hr, and CO to 2,000 ppmv. The Tier 2 or better emergency and fire pump engines will easily meet these requirements.

Rule 2.34 limits NO_x emissions from turbines to a level based on the efficiency of the turbine. The BACT levels proposed for this project are well below Rule 2.34 limits.

Rule 9.3 prohibits the use of chromium-based chemicals in cooling towers. Chromium-based chemicals will not be used in the cooling tower.

5.1.8 Agencies and Agency Contacts

Agencies and agency contact for air quality issues are listed in Table 5.1-33

TABLE 5.1-33
Agency Contacts for Air Quality

Issue	Agency	Contact
Oversight of permit issuance, enforcement, PSD permit issuance	EPA Region IX	Gerardo Rios, Chief Permits Office EPA Region IX 75 Hawthorne Street San Francisco, CA 94105 (415) 744-1259
Regulatory oversight	California Air Resources Board	Mike Tollstrup, Chief Project Assessment Branch California Air Resources Board 2020 L Street Sacramento, CA 95814 (916) 322-6026
Permit issuance, enforcement	Yolo-Solano Air Quality Management District	Mat Ehrhardt Air Pollution Control Officer Yolo-Solano Air Quality Management District 1947 Galileo Ct., Suite 103 Davis, CA 95618

5.1.9 Permits and Permit Schedule

TABLE 5.1-34
Permits and Permit Schedule for Air Quality

Permit	Agency Contact	Schedule
PSD Permit	Gerardo Rios, Chief Permits Office EPA Region IX 75 Hawthorne Street San Francisco, CA 94105 (415) 744-1259	Application Submittal: August 2008 Draft permit expected: 10/1/09
Determiation of Compliance	Mat Ehrhardt Air Pollution Control Officer Yolo-Solano Air Quality Management District 1947 Galileo Ct., Suite 103 Davis, CA 95618	Application Submittal: August 2008 PDOC expected: 4/1/09 FDOC expected: 6/1/09

5.1.10 References

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