3.3

AIR QUALITY

3.3 Air Quality

This section of the Draft EIR describes the impacts of the implementation of the proposed City of Merced General Plan on local and regional air quality, based on the assessment guidelines of the San Joaquin Valley Air Pollution Control District (SJVAPCD). This section describes existing air quality, construction-related impacts, direct and indirect emissions associated with the proposed plan, the local and regional impacts of those emissions, and mitigation measures warranted to reduce or eliminate any identified significant impacts.

3.3.1 SETTING

Environmental Setting

The project is located in the San Joaquin Valley Air Basin (SJVAB) (Figure 3.3-1), which occupies the southern half of the Central Valley and is approximately 250 miles in length and, on average, 35 miles in width. The Coast Range, which has an average elevation of 3,000 feet, serves as the western border of the SJVAB. The San Emigdio Mountains, part of the Coast Range, and the Tehachapi Mountains, part of the Sierra Nevada, are both located to the south of the SJVAB. The Sierra Nevada extends in a northwesterly direction and forms the eastern boundary of the SJVAB. The SJVAB is basically flat with a downward gradient to the northwest.

The climate of the SJVAB is strongly influenced by the presence of these mountain ranges. The mountain ranges to the west and south induce winter storms from the Pacific to release precipitation on the western slopes, producing a partial rain shadow over the valley. A rain shadow is defined as the region on the leeward side of a mountain where precipitation is noticeably less because moisture in the air is removed in the form of clouds and precipitation on the windward side. In addition, the mountain ranges block the free circulation of air to the east, resulting in the entrapment of stable air in the valley for extended periods during the cooler months.

Winter in the SJVAB is characterized as mild and fairly humid, and the summer is hot, dry, and cloudless. During the summer, a Pacific high-pressure cell is centered over the northeastern Pacific Ocean, resulting in stable meteorological conditions and a steady northwesterly wind.

Existing Ambient Air Quality

The California Air Resources Board (CARB) and the United States Environmental Protection Agency (EPA) currently focus on the following air pollutants as indicators of ambient air quality: Ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM), and lead. Because these are the most prevalent air pollutants known to be deleterious to human health and extensive health-effects criteria documents are available, they are commonly referred to as "criteria air pollutants."

The EPA has established primary and secondary National Ambient Air Quality Standard (NAAQS) for the following criteria air pollutants: O_3, CO, NO_2, SO_2, PM_{10}, fine particulate

matter ($PM_{2.5}$), and lead. The primary standards protect the public health and the secondary standards protect the public welfare. In addition to the NAAQS, CARB has established California Ambient Air Quality Standard (CAAQS) for the following criteria air pollutants: sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particulate matter. In most cases, the CAAQS are more stringent than the NAAQS. The NAAQS and CAAQS as discussed further in the regulatory section below.

Criteria air pollutant concentrations are measured at several monitoring stations in the SJVAB. From 1991 to the present, there have been two monitoring stations within the City of Merced: S Coffee Avenue and 2334 M Street. Table 3.3-1 summarizes the air quality data from these locations for the most recent years available. Ambient air quality conditions with respect to each separate criteria pollutant are described below.

Table 3.3-1
Ambient Air Quality in City of Merced
(Number of Days Exceeding State and Federal Standards)

Year	Merced- S Coffee Avenue					Merced- 2334 M Street				
	State Ozone	Federal Ozone	State PM_{10} [1]	Federal PM_{10} [1]	Federal $PM_{2.5}$ [2]	State Ozone	Federal Ozone	State PM_{10} [1]	Federal PM_{10} [1]	Federal $PM_{2.5}$ [2]
2009	0	0	*	*	*	*	*	32.5	0	25.1
2008	14	3	*	*	*	*	*	87.2	0	*
2007	5	0	*	*	*	*	*	36.5	0	3.3
2006	4	0	*	*	*	*	*	47.4	0	0
2005	6	0	*	*	*	*	*	29	0	0
2004	14	0	*	*	*	*	*	12.3	0	0
2003	54	0	*	*	*	*	*	44.4	*	*
2002	55	2	*	*	*	*	*	84.8	0	3.1
2001	26	0	*	*	*	*	*	*	0	*
2000	32	0	*	*	*	*	*	69.6	0	*
1999	42	2	*	*	*	*	*	*	*	*
1998	37	3	*	*	*	*	*	*	*	*
1997	1	0	*	*	*	*	*	*	*	*
1996	44	1	*	*	*	*	*	*	*	*
1995	38	3	*	*	*	*	*	96.3	0	*
1994	31	0	*	*	*	*	*	60.8	0	*
1993	22	1	*	*	*	*	*	108.8	0	*
1992	39	0	*	*	*	*	*	138.8	0	*
1991	13	2	*	*	*	*	*	151.6	0	*

[1]Measurements of PM_{10} are made every sixth day. Data is the estimated number of days that the standard would have been exceeded had measurements been collected every day.
[2]National 1997 24-Hour $PM_{2.5}$ Standard
*There was insufficient (or no) data available to determine the value.

Source: Air Resources Board Aerometric Data Analysis and Management System (ADAM)

Both CARB and EPA use monitoring data to designate areas according to their attainment status for criteria air pollutants. The purpose of the designations is to identify those areas with air quality problems and thereby initiate planning efforts for improvement. The three basic designation categories are nonattainment, attainment, and unclassified. Unclassified is used in an area that cannot be classified on the basis of available information as meeting or not meeting the standards. In addition, the California designations include a subcategory of the nonattainment designation, called nonattainment-transitional. The nonattainment-transitional

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Figure 3.3-1

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designation is given to nonattainment areas that are progressing and nearing attainment. Attainment designations with respect to the Planning Area are shown in Table 3.3-2 for each criteria pollutant.

Table 3.3-2
Merced County Attainment Designation (Federal and State)

Pollutant	Designation/Classification	
	Federal Standards	State Standards
Ozone - One hour	No Federal Standard (See note below)	Non-attainment/Severe
Ozone - Eight hour	Non-attainment	Non-attainment
PM_{10} (Particulate matter 10 micrometers in diameter)	Unclassified/Attainment	Non-attainment
$PM_{2.5}$ (Particulate matter 2.5 micrometers in diameter)	Non-attainment	Non-attainment
Carbon Monoxide	Unclassified/Attainment	Unclassified
Nitrogen Dioxide	Unclassified/Attainment	Attainment
Sulfur Dioxide	Unclassified/Attainment	Attainment
Lead (Particulate)	Unclassified/Attainment	Attainment
Hydrogen Sulfide	*No Federal Standard*	Unclassified
Sulfates	*No Federal Standard*	Attainment
Visibility Reducing Particles	*No Federal Standard*	Unclassified
Note: The Federal One-Hour Ozone National Ambient Air Quality Standard was revoked on June 15, 2005.		

Source: California Air Resources Board, 2009, U.S. EPA, 2009

OZONE

Ozone (O_3) is a photochemical oxidant, a substance whose oxygen combines chemically with another substance in the presence of sunlight, and the primary component of smog. O_3 is not directly emitted into the air, but is formed through complex chemical reactions between precursor emissions of Reactive Organic Gases (ROG's) and NOx, the combined emissions of Nitrous Oxide (NO) and NO_2, in the presence of sunlight. ROG are volatile organic compounds that are photochemically reactive. ROG emissions result primarily from incomplete combustion and the evaporation of chemical solvents and fuels. NO_x are a group of gaseous compounds of nitrogen and oxygen that results from the combustion of fuels.

O_3 occurs in two layers of the atmosphere. The layer surrounding the earth's surface is the troposphere. Here, ground level or "bad" ozone is an air pollutant that damages human health, vegetation, and many common materials. It is a key ingredient of urban smog because sunlight and heat serve as catalysts for the reaction between O_3 precursors, peak O_3 concentrations typically occur during the summer in the Northern Hemisphere. The troposphere extends to a level about 10 miles up, where it meets the second layer, the stratosphere. The stratospheric or "good" ozone layer extends upward from about 10 to 30 miles and protects life on earth from the sun's harmful ultraviolet rays (UV-B).

The adverse health effects associated with exposure to O_3 pertain primarily to the respiratory system. Scientific evidence indicates that ambient levels of O_3 affect not only sensitive receptors, such as asthmatics and children, but healthy adults as well. Exposure to ambient levels of O_3 ranging from 0.10 to 0.40 ppm for 1 to 2 hours has been found to significantly alter lung functions by increasing respiratory rates and pulmonary resistance, decreasing tidal

volumes, and impairing respiratory mechanics. Ambient levels of O_3 above 0.12 ppm are linked to symptomatic responses that include such symptoms as throat dryness, chest tightness, headache, and nausea. In addition to the above adverse health effects, evidence also exists relating O_3 exposure to an increase in the permeability of respiratory epithelia; such increased permeability leads to an increase in responsiveness of the respiratory system to challenges, and the interference or inhibition of the immune system's ability to defend against infection.

With respect to the NAAQS, Merced County is currently designated as a non-attainment area for the 8-hour ozone standard shown in Table 3.3-2. In addition, Merced County is currently designated as a severe non-attainment area for the state 1-hour ozone standard and non-attainment for the state 8-hour ozone standard.

As shown in Table 3.3-1, the national 1-hour ozone standard was exceeded at the S Coffee Avenue monitoring station on 14 days from 1991 to 2002. Between 2003 and 2009, the 1-hour standard was only exceeded 3 times (all 3 events occurred in 2008). State 1-hour ozone standard violations, however, occurred on 380 days from 1991 to 2002, and on another 97 days from 2003 to 2008. The ozone problem in the SJVAB ranks among the most severe in California. Table 3.3-3 summarizes the ozone data in the San Joaquin Basin for the years 1986 to 2009.

Table 3.3-3
Ozone Trends Summary: San Joaquin Valley Air Basin

Year	Days> Standards			1-Hour Observations		8-Hour Averages			1-Year Coverage
	1-Hour		8-Hour	3-Year		3-Year			
	State	Nat'l	Nat'l	Maximum	4thHigh	Maximum	4th High	EPDC	
2009	82	4	98	0.135	0.140	0.110	0.105	n/a	100
2008	95	19	127	0.157	0.136	0.132	0.108	0.128	100
2007	69	3	110	0.138	0.135	0.110	0.107	0.124	100
2006	90	18	120	0.141	0.135	0.122	0.110	0.119	100
2005	83	8	102	0.134	0.149	0.114	0.113	0.124	100
2004	106	9	143	0.155	0.151	0.126	0.116	0.127	99
2003	137	37	160	0.156	0.1551	0.127	0.115	0.128	100
2002	127	31	158	0.164	0.151	0.133	0.115	0.124	100
2001	123	32	162	0.149	0.146	0.120	0.109	0.123	100
2000	114	30	144	0.165	0.161	0.132	0.111	0.132	100
1999	123	28	153	0.155	0.161	0.123	0.113	0.132	100
1998	90	39	112	0.169	0.161	0.137	0.115	0.134	99
1997	110	16	138	0.147	0.164	0.127	0.115	0.139	100
1996	120	56	143	0.165	0.165	0.137	0.119	0.136	100
1995	124	44	142	0.173	0.165	0.134	0.119	0.134	99
1994	118	43	137	0.175	0.160	0.129	0.111	0.127	99
1993	125	43	144	0.160	0.160	0.125	0.112	0.131	99
1992	127	29	155	0.160	0.160	0.121	0.115	0.129	99
1991	133	51	145	0.180	0.160	0.130	0.118	0.132	99
1990	131	45	153	0.170	0.160	0.124	0.119	0.125	99
1989	148	54	159	0.180	0.170	0.136	0.120	0.136	99
1988	156	74	178	0.190	0.170	0.128	0.121	0.135	98
1987	156	65	179	0.200	0.170	0.150	0.118	0.134	100
1986	147	59	167	0.180	0.170	0.135	0.117	0.130	98

Years: Ozone data are available for this basin from 1974 through 2009.
Notes: All concentrations expressed as parts per million.

Year	Days> Standards			1-Hour Observations		8-Hour Averages			1-Year Coverage
	1-Hour		8-Hour	3-Year		3-Year			
	State	Nat'l	Nat'l	Maximum	4thHigh	Maximum	4th High	EPDC	
*There was insufficient (or no) data available to determine the value									

Source: California Air Resources Board, Air Quality Trend Summaries, July 2009 (http://www.arb.ca.gov)

Maximum peak ozone values in the SJVAB have trended downwards over the last twenty years, as shown in Table 3.3-1 and Table 3.3-3. The number of days in which the national 1-hour standard was exceeded has been varied over the years, but indicates an overall improvement.

CARBON MONOXIDE

Unlike ozone, carbon monoxide (CO) is released directly into the atmosphere by stationary and mobile sources and typically found at high concentrations near the source of emission. CO is a colorless, odorless, and poisonous gas produced by incomplete burning of carbon in fuels, primarily from mobile (transportation) sources of pollution. In fact, 77 percent of the nationwide CO emissions are from mobile sources. The other 23 percent consists of CO emissions from wood-burning stoves, incinerators, and industrial sources.

CO enters the bloodstream through the lungs by combining with hemoglobin, which normally supplies oxygen to the cells. However, CO combines with hemoglobin much more readily than oxygen does, resulting in a drastic reduction in the amount of oxygen available to the cells. Adverse health effects associated with exposure to CO concentrations include such symptoms as dizziness, headaches, and fatigue. CO exposure is especially harmful to individuals who suffer from cardiovascular and respiratory diseases.

Merced County is currently designated as an unclassified or unclassified/attainment area for the state and national CO standards (Table 3.3-2).

With respect to CO air quality trends according to the 2009 California Almanac of Emissions and Air Quality (California Air Resources Board 2007), the maximum peak 8-hour trend for the SJVAB shows a fairly consistent downward trend from 1982 to 2001, with year-to-year variability especially in the 1980's because of meteorological conditions (Table 3.3-4). The national CO standards have not been exceeded since 1991 and the state standards have not been exceeded since 1995. The decline in ambient CO is attributable to the introduction of cleaner fuels and newer, cleaner motor vehicles.

Table 3.3-4
Carbon Monoxide Trends Summary: San Joaquin Valley Air Basin

Year	Peak 8-hr. Indicator (State)	Max 8-hr. Concentration (State)	Max 1-hr Concentration	Days Above State 8-hr. std.	Days Above Nat. 8-hr. std.
2007	3.4	3.2	4.4	0	0
2006	3.4	3.7	6.9	0	0
2005	3.7	3.0	4.3	0	0
2004	4.2	3.0	4.6	0	0
2003	4.8	4.1	5.8	0	0

Year	Peak 8-hr. Indicator (State)	Max 8-hr. Concentration (State)	Max 1-hr Concentration	Days Above State 8-hr. std.	Days Above Nat. 8-hr. std.
2002	5.3	4.5	6.1	0	0
2001	6.4	6.0	8.4	0	0
2000	8.4	6.6	10.1	0	0
1999	5.5	7.8	11.9	0	0
1998	8.3	8.0	10.3	0	0
1997	9.0	7.5	9.9	0	0
1996	9.9	7.0	11.0	0	0
1995	10.9	9.1	12.0	1.0	0
1994	10.0	8.9	15.0	0.0	0
1993	10.0	9.3	13.0	2.0	0
1992	11.5	8.3	13.0	0	0
1991	13.2	11.4	19.0	3.0	3.0
1990	19.9	11.5	17.0	10.0	9.0
1989	13.7	13.4	23.0	24.0	18.0
1988	14.1	16.5	19.0	5.0	6.0
1987	13.9	12.9	16.0	4.0	4.0
1986	13.9	16.3	21.0	13.0	11.0

Source: 2009 California Almanac of Emissions and Air Quality

NITROGEN DIOXIDE

NO_2 is a brownish, highly reactive gas that is present in all urban environments. The major human-made sources of NO_2 are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. Combustion devices emit primarily nitric oxide (NO), which reacts through oxidation in the atmosphere to form NO_2. The combined emissions of NO and NO_2 are referred to as NOx, which are reported as equivalent NO_2. Because NO_2 is formed and depleted by reactions associated with photochemical smog (O_3), the NO_2 concentration in a particular geographical area may not be representative of the local NOx emission sources.

Inhalation is the most common route of exposure to NO_2. Because NO_2 has relatively low solubility in water, the principal site of toxicity is in the lower respiratory tract. The severity of the adverse health effects depends primarily on the concentration inhaled rather than the duration of exposure. An individual may experience a variety of acute symptoms, including coughing, difficulty with breathing, vomiting, headache, and eye irritation during or shortly after exposure. After a period of approximately 4 to 12 hours, an exposed individual may experience chemical pneumonitis or pulmonary edema with breathing abnormalities, cough, cyanosis, chest pain, and rapid heartbeat. Severe, symptomatic NO_2 intoxication after acute exposure has been linked on occasion with prolonged respiratory impairment with such symptoms as chronic bronchitis and decreased lung functions.

Merced County is currently designated as an attainment or unclassified/attainment area for the state and national NO_2 standards (Table 3.3-2).

SULFUR DIOXIDE

SO_2 is produced by such stationary sources as coal and oil combustion, steel mills, refineries, pulp and paper mills. The major adverse health effects associated with SO_2 exposure pertain to the upper respiratory tract. SO_2 is a respiratory irritant with constriction of the bronchioles occurring with inhalation of SO_2 at 5 ppm or more. On contact with the moist mucous membranes, SO_2 produces sulfurous acid, which is a direct irritant. Concentration rather than duration of the exposure is an important determinant of respiratory effects. Exposure to high SO_2 concentrations may result in edema of the lungs or glottis and respiratory paralysis.

Merced County is currently designated as an attainment or unclassified/attainment area for the state and national SO_2 standards (Table 3.3-2).

PARTICULATE MATTER

Particulate matter pollution consists of very small particles suspended in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter also forms when industry and gaseous pollutant undergo chemical reactions in the atmosphere. Respirable particulate matter (PM_{10}) and fine particulate matter ($PM_{2.5}$) represent fractions of particulate matter. PM_{10} refers to particulate matter less than 10 microns in diameter and $PM_{2.5}$ refers to particulate matter that is 2.5 microns or less in diameter. Major sources of $PM_{2.5}$ results primarily from diesel fuel combustion (from motor vehicles, power generation, and industrial facilities), residential fireplaces, and wood stoves. PM_{10} include all $PM_{2.5}$ sources as well as emissions from dust generated by construction, landfills, and agriculture; wildfires and brush/waste burning, industrial sources, windblown dust from open lands, and atmospheric chemical and photochemical reactions.

The adverse health effects associated with PM_{10} depend on the specific composition of the particulate matter. For example, health effects may be associated with metals, polycyclic aromatic hydrocarbons, and other toxic substances absorbed onto fine particulate matter, which is referred to as the piggybacking effect, or with fine dust particles of silica or asbestos. Generally, adverse health effects associated with PM_{10} may result from both short-term and long-term exposure to elevated PM_{10} concentrations and may include breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, alterations to the immune system, carcinogenesis, and premature death. $PM_{2.5}$ poses an increased health risk because the particles can deposit deep in the lungs and contain substances that are particularly harmful to human health.

Merced County is currently designated as a non-attainment area for the state and national PM_{10} and $PM_{2.5}$ standards (Table 3.3-2).

Direct emissions of PM_{10} have decreased from 1991 to 2007 and in 2009 in Merced County as shown in Table 3.3-1; however, PM_{10} emissions in the San Joaquin Valley Air Basin (Table 3.3-5) have not shown a significant downward trend. CARB's Almanac of Emissions and Air Quality (California Air Resources Board 2007) projects that PM_{10} emissions will remain nearly constant between 2005 and 2020. PM_{10} emissions in the SJVAB are dominated by

emissions from area-wide sources, primarily from vehicle travel on unpaved and paved roads, waste burning, and residential fuel combustion.

Table 3.3-5
PM_{10} Trends Summary: San Joaquin Valley Air Basin

Year	Est Days>Standard		Annual Average		3-Year Average		High 24-Hr Average			1-Year Coverage
	Nat'l	State	Nat'l	State	Nat'l	State	Nat'l	State	EPDC	
2009	1.9	123.4	*	46.5	*	56	423.8	139.5		
2008	4.8	182.3	59.7	56.0	57	56	358.8	353.5	244.5	--
2007	1.4	145.2	54.8	48.5	51	56	172.1	135	207.6	100
2006	4.2	166.8	55.4	56.5	47	56	304	255	206.5	100
2005	0	146.3	44.3	44.5	46	52	131	137	190.0	100
2004	0.9	113	47.9	43.6	51	60	217	219	202.4	100
2003	0	167.2	52.4	52.3	55	60	150	150	202.5	100
2002	2.9	255.8	59.2	59.9	56	60	189	194	216.6	100
2001	4	167.9	57.4	52.3	56	60	212	221	217.5	100
2000	0	195.6	53.1	53.9	49	60	145	153	208.0	100
1999	3.8	182.1	59.5	60.1	45	60	183	186	*	100
1998	5.4	101.8	52.5	40.5	42	40	160	167	*	100
1997	1.9	106.7	48.2	47.3	53	58	227.7	199	216.6	100
1996	0	204	52	54.1	*	58	153	153	207.4	100
1995	4.2	184.2	58.2	57.9	52	58	279	279	245.8	100
1994	1.9	166.1	50.1	49.6	54	62	192	192	229.5	100
1993	2.9	183.3	56.9	56.3	65	70	239	239	266.4	100
1992	9.2	246.1	62.9	62.4	73	80	186	186	289.8	100
1991	40.2	225.3	76.3	70	78	80	279	279	289.5	100
1990	54	292.5	79.3	80.1	75	80	439	439	263.1	100
1989	28.8	208.2	79.3	67	*	67	237	237	*	100
1988	46.3	158.5	74.3	52.7	*	53	206	206	*	98

Years: PM_{10} data are available for this basin from 1988 through 2009.

Notes: All concentrations expressed in micrograms per cubic meter. State and national statistics may differ for the following reasons:

- State statistics are based on California approved samplers, whereas national statistics are based on samplers using federal reference or equivalent methods.
- State and national statistics may therefore be based on different samplers.
- State statistics for 1998 and later are based on local conditions (except for the South Coast Air Basin, where State statistics for 2002 and later are based on local conditions).
- National statistics are based on standard conditions.
- State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.

*There was insufficient (or no) data available to determine the value.

Source: California Air Resources Board, 2010

LEAD

Lead is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been mobile and industrial sources. As a result of the phase-out of leaded gasoline, as discussed in detail below, metal processing is currently the primary source of lead emissions. The highest levels of lead in the air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufacturers.

Twenty years ago, mobile sources were the main contributor to ambient lead concentrations in the air. In the early 1970s, EPA set national regulations to gradually reduce the lead content in gasoline. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. EPA banned the use of leaded gasoline in highway vehicles in December 1995.

As a result of EPA's regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector have declined dramatically (95% between 1980 and 1999), and levels of lead in the air decreased by 94 percent between 1980 and 1999. Transportation sources, primarily airplanes, now contribute only 13 percent of lead emissions. A recent National Health and Nutrition Examination Survey reported a 78 percent decrease in the levels of lead in people's blood between 1976 and 1991. This dramatic decline can be attributed to the move from leaded to unleaded gasoline (as well as the removal of lead from soldered cans).

The decrease in lead emissions and ambient lead concentrations over the past 25 years is one of California's most dramatic success stories. As stated above, the rapid decrease in lead concentrations can be attributed primarily to phasing out the lead in gasoline. This phase-out began during the 1970s, and subsequent CARB regulations have virtually eliminated all lead from gasoline now sold in California. All areas of the state are currently designated as attainment for the state lead standard (the EPA does not designate areas for the national lead standard). Although the ambient lead standards are no longer violated, lead emissions from stationary sources still pose "hot spot" problems in some areas. As a result, the CARB identified lead as a toxic air contaminant.

Regulatory Setting

FEDERAL AND STATE

Federal Clean Air Act

The Federal Clean Air Act (FCAA) was first signed into law in 1970. In 1977, and again in 1990, the law was substantially amended. The FCAA is the foundation for a national air pollution control effort, and it is composed of the following basic elements: national ambient air quality standards for criteria air pollutants, hazardous air pollutant standards, state attainment plans, motor vehicle emissions standards, stationary source emissions standards and permits, acid rain control measures, stratospheric ozone protection, and enforcement provisions.

The US Environmental Protection Agency (EPA) is responsible for administering the FCAA. The FCAA requires the EPA to set National Ambient Air Quality Standards (NAAQS) for several problem air pollutants based on human health and welfare criteria. Two types of NAAQS were established: primary standards, which protect public health, and secondary standards, which protect the public welfare from non-health-related adverse effects such as visibility reduction.

The FCAA recognizes the importance for each state to locally carry out the Clean Air Act, as special consideration of local industries; geography, housing patterns, etc. are needed to have full comprehension of the local pollution control problems. As a result, the EPA requires each state

to develop a State Implementation Plan (SIP) that explains how each state will implement the FCAA within their jurisdiction. A State Implementation Plan (SIP) is a collection of rules and regulations that a particular state will implement to control air quality within their jurisdiction. The CARB is the state agency that is responsible for preparing the California SIP.

National Emissions Standards for Hazardous Air Pollutants (NESHAP) (40 CFR Part 61, Subpart M)

The NESHAPs are emissions standards set by the US EPA for an air pollutant not covered by National Ambient Air Quality Standards that may cause an increase in fatalities or in serious, irreversible, or incapacitating illness. The standards for a particular source category require the maximum degree of emission reduction that the EPA determines to be achievable, which is known as the Maximum Achievable Control Technology (MACT).

California Clean Air Act

The California Clean Air Act (CCAA) was first signed into law in 1988. The CCAA provides a comprehensive framework for air quality planning and regulation, and spells out in statute the state's air quality goals, planning and regulatory strategies, and performance. The CARB is the agency responsible for administering the CCAA. CARB established ambient air quality standards pursuant to the California Health and Safety Code (CH&SC) [§39606(b)], which are similar to the federal standards.

Ambient Air Quality Standards

National ambient air quality standards are determined by the Environmental Protection Agency. The standards include both primary and secondary ambient air quality standards. Primary standards are established with a safety margin. Secondary standards are more stringent than primary standards and are intended to protect public health and welfare. States have the ability to set standards that are more stringent than the federal standards. As such, California established more stringent ambient air quality standards.

Federal and state ambient air quality standards have been established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, suspended particulates (PM_{10}) and lead. In addition, California has created standards for pollutants that are not covered by federal standards including sulfates and hydrogen sulfide. The federal and state primary standards for major pollutants are shown in Table 3.3-6 below.

Table 3.3-6
Federal and State Air Quality Standards

Pollutant	Average Time	California Standards[a] Concentration[c]	Federal Standards[b] Primary[c, d]
Ozone (O_3)	1 hour	0.09 ppm (180µg/m^3)	—
	8 hours	0.07 ppm (137 mg/m^3)	0.08 ppm (157 µg/m^3
Respirable Particulate Matter (PM_{10})	24 hours	50 µg/m^3	150 µg/m^3
	Annual arithmetic mean	20 µg/m^3	50 µg/m^3
	24 hours	65 µg/m^3	65 µg/m^3

Pollutant	Average Time	California Standards[a] Concentration[c]	Federal Standards[b] Primary[c, d]
Fine Particulate Matter ($PM_{2.5}$)	24 hours	65 µg/m^3	65 µg/m^3
	Annual arithmetic mean	12 µg/m^3	15 µg/m^3
Carbon Monoxide (CO)	8 hours	9.0 ppm (10 µg/m^3)	9 ppm (10 mg/m^3)
	1 hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)
Nitrogen Dioxide (NO_2)*	Annual arithmetic mean	—	0.053 ppm (100 µg/m^3)
	1 hour	0.25 ppm (470 µg/m^3)	—
Sulfur Dioxide (SO_2)	Annual arithmetic mean	—	0.030 ppm (80 µg/m^3)
	24 hours	0.04 ppm (105 µg/m^3)	0.14 ppm (365 µg/m^3)
	1 hour	0.25 ppm (655 µg/m^3)	—
Lead (Pb)[e]	30-day average	1.5 µg/m^3	—
	Calendar quarter	—	1.5 µg/m^3
Visibility Reducing Particles	8 hours	[f]	—
Sulfates	24 hours	25	—
Hydrogen Sulfide	1 hour	0.03 ppm (42 µg/m^3)	—
Vinyl Chloride[e]	24 hours	0.010 ppm (26 µg/m^3)	—

ppm = Parts Per Million
µg/m^3 = micrograms per cubic meter
mg/m^3 = milligrams per cubic meter

* The Nitrogen Dioxide ambient air quality standard was amended on February 22, 2007, to lower the 1-hr standard to 0.18 ppm and establish a new annual standard of 0.030 ppm. These changes become eff3ective after regulatory changes are submitted and approved by the Office of Administrative Law, expected later this year.

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

[b] National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest either hour concentration or a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration of 150 µg/m^3) is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98% of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact US EPA for further clarification and current federal policies.

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

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

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

[f] Extinction coefficient of 0.23 per kilometer — visibility of ten miles or more (0.07 — 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.

Source: California Air Resources Board, 2010

State Implementation Plan

The State Implementation Plan (SIP) is the blueprint for meeting federal air quality standards by the applicable deadlines set in the Federal Clean Air Act. California's SIP is a compilation of region-specific plans that detail how each area will meet the air quality standards. The plan includes an estimate of the emission reductions needed to meet each air quality standard based on air monitoring results, data on emission sources, and complex air quality modeling. It reflects the benefits of the pollution control program adopted by air agencies at all levels, and may also include commitments to implement new strategies. Together, these elements must reduce emissions by an amount sufficient to meet the air quality standard in each region. Once the local element of the plan is adopted by the air district(s) and other responsible local agencies, it is sent to the CARB for adoption and then formally submitted to the Environmental Protection Agency for approval as a revision to the California SIP.

Assembly Bill 170

AB 170 was adopted by state lawmakers in 2003 creating Government Code Section 65302.1 which requires cities and counties in the San Joaquin Valley to amend their general plans to include data and analysis, comprehensive goals, policies and feasible implementation strategies designed to improve air quality. These amendments are due no later than one year from the due date specified for the next revisions of a jurisdiction's housing element

As required in Section 65302.1.b, cities and counties within the San Joaquin Valley must amend the general plan to include a discussion of the status of air quality and strategies to improve air quality. The elements to be amended include, but are not limited to, those elements dealing with land use, circulation, housing, conservation, and open space. Section 65302.1.c identifies four (4) areas of air quality discussion required in these amendments. These areas include: (1) a report describing local air quality conditions, attainment status, and state and federal air quality and transportation plans; (2) a summary of local, district, state, and federal policies, programs, and regulations to improve air quality; (3) a comprehensive set of goals, policies, and objectives to improve air quality; and (4) feasible implementation measures designed to achieve these goals.

LOCAL

Air pollution does not respect political boundaries. Therefore, many air quality problems are best managed on a regional basis. This was the case for the San Joaquin Valley where until 1991, each County operated a local air pollution control district (APCD). The State Legislature than determined that management of the entire air basin by a single agency would be more effective. Air basins are geographic areas sharing a common "air-shed." Most major metropolitan areas in California now fall under unified air pollution control districts (UAPCDs), or air quality management districts (AQMDs).

San Joaquin Valley Air Pollution Control District

The SJVAPCD attains and maintains air quality conditions in Merced County through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean air strategy of the SJVAPCD

includes the preparation of plans for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations concerning sources of air pollution, and issuance of permits for stationary sources of air pollution. The SJVAPCD also inspects stationary sources of air pollution and responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements programs and regulations required by the FCAA and the CCAA.

In January 2002, the SJVAPCD released a revision to the previously adopted guidelines document (SJVAPCD 1998). This revised Guide for Assessing and Mitigating Air Quality Impacts (GAMAQI) (SJVAPCD 2002) is an advisory document that provides lead agencies, consultants, and project applicants with uniform procedures for addressing air quality in environmental documents. The GAMAQI contains the following applicable components:

- Criteria and thresholds for determining whether a project may have a significant adverse air quality impact;

- Specific procedures and modeling protocols for quantifying and analyzing air quality impacts;

- Methods available to mitigate air quality impacts;

- Information for use in air quality assessments and EIR's that will be updated more frequently such as air quality data, regulatory setting, climate, topography, etc.

The SJVAPCD has also prepared the Air Quality Guidelines for General Plans (AQGGP) (revised June 2005) to provide local planning agencies with a comprehensive set of goals and policies that will improve air quality if adopted in a general plan; to provide a guide to cities and counties for determining which goals and policies are appropriate in their particular community; and to provide justification and rationale for the goals and policies that will convince decision makers and the public that they are appropriate and necessary.

ISR- Indirect Source Review. The ISR Rule (Rule 9510) and the Administrative ISR Fee Rule (Rule 3180) are the result of state requirements outlined in the California Health and Safety Code, Section 40604 and the SIP. The District's SIP commitments are contained in the District's 2003 PM_{10} Plan and Extreme Ozone Attainment Demonstration Plan (Plans), which identify the need to reduce PM_{10} and NOx in order to reach the ambient air-pollution standards on schedule. The Plans identify growth and reductions in multiple source categories. The Plans quantify the reduction from current District rules and proposed rules, as well as state and federal regulations, and then model future emissions to determine if the District may reach attainment for applicable pollutants (http://www.valleyair.org/ISR/ISROverview.htm).

This rule applies to new developments that are over a certain threshold size. Any of the following projects require an application to be submitted unless the projects have mitigated emissions of less than two tons per year each of NO_X and PM_{10}. Projects that are at least:

- 50 residential units
- 2,000 square feet of commercial space

- 9,000 square feet of educational space
- 10,000 square feet of government space
- 20,000 square feet of medical or recreational space
- 25,000 square feet of light industrial space
- 39,000 square feet of general office space
- 100,000 square feet of heavy industrial space
- Or, 9,000 square feet of any land use not identified above

Air Quality Plans. The SJVAPCD submitted the 1991 Air Quality Attainment Plan in compliance with the requirements set forth in the CCAA. In addition, the CCAA requires a triennial assessment of the extent of air quality improvements and emission reductions achieved through the use of control measures. As part of this assessment, the attainment plan must be reviewed and, if necessary, revised to correct for deficiencies in progress and to incorporate new data or projections. The CCAA requirement for a first triennial progress report and revisions of the 1991 Air Quality Attainment Plan was first fulfilled with the preparation and adoption of the 1995-1997 Triennial Progress Report and Plan Revision. Triennial reports were also prepared for 1995-1997, 1997-1999, and 1999-2001 in compliance with the CCAA.

In an effort to reach attainment for ozone, the SJVAPCD has adopted and submitted several ozone and PM_{10} plans in its planning history in an effort to reach attainment. In the most current effort to reach attainment for ozone, the SJVAPCD submitted the 2007 Ozone Plan. This plan contains a comprehensive and exhaustive list of regulatory and incentive-based measures to reduce emissions of ozone and particulate matter precursors throughout the Valley. Additionally, this plan calls for major advancements in pollution control technologies for mobile and stationary sources of air pollution, and a significant increase in state and federal funding for incentive-based measures to create adequate reductions in emissions to bring the entire Valley into attainment with the federal ozone standard. The proposed plan calls for a 75% reduction in ozone-forming oxides of nitrogen (NOx) emissions.

In June 2003, the District prepared the 2003 PM_{10} Plan. The 2003 PM_{10} Plan was amended in 2003 and in 2005. The 2006 PM_{10} Plan Update was adopted by the SJVAPCD in February 2006 and contains the existing measures adopted by EPA, CARB and the SJVAPCD and the additional measures needed to reach attainment of the PM_{10} standards.

The SJVAPCD's planning documents also identify voluntary strategies to further reduce air quality impacts in the San Joaquin Valley Air Basin (SJVAB). Included in these strategies are an enhanced California Environmental Quality Act (CEQA) program and the promotion of air quality elements or policies for General Plans in all SJVAB cities and counties. The SJVAPCD reviews and comments on CEQA documents and permit applications sent from SJVAB public agencies. Comments from the SJVAPCD include expert advice on level of significance, applicable rules and regulations, and suggested mitigation measures.

In addition to the above mentioned items, the SJVAPCD has submitted numerous plans with respect to ozone, PM_{10}, $PM_{2.5}$ and CO in compliance with the FCAA and CCAA, as listed below:

- ***Carbon Monoxide Plans***

  - 1992 Federal Attainment Plan for Carbon Monoxide

- ***Ozone Plans***

  - Air Quality Attainment Plan (AQAP), Jan. 1992
  - Revised 1993 Rate of Progress (ROP) Plan, Nov. 1994
  - Ozone Attainment Demonstration Plan (OADP), Nov. 1994
  - Revised Post 1996 ROP Plan, Sept. 1995
  - California Clean Air Act (CCAA) Triennial Progress Report and Plan Revision 1995-1997 (1997 Triennial Update), Dec. 1998
  - CCAA Triennial Progress Report and Plan Revision 1997-1999 (2000 Triennial Plan Update), March 2001
  - 2000 Ozone ROP Report, April 2000
  - 2002 – 2005 Ozone ROP Plan, May 2002
  - 2002 – 2005 Ozone ROP Plan (Amended), Dec. 2002
  - 2004 Extreme Ozone Attainment Demonstration Plan, Oct. 2004
  - 2004 Extreme Ozone Attainment Demonstration Plan (Amended), Oct. 2005
  - 2007 Ozone Plan, April 30, 2007

- ***PM_{10} Plans***

  - PM_{10} Attainment Demonstration Plan, May 1997 (Withdrawn)
  - PM_{10} Attainment Demonstration Plan Progress Report 1997-1999, Aug. 2000
  - 2003 PM_{10} Plan, June 2003
  - 2003 PM_{10} Plan (Amended), Dec. 2003
  - 2005 Amendments to the 2003 PM10 Plan, May 2005
  - 2006 PM_{10} Plan Update, February 2006

- ***$PM_{2.5}$ Plan***

  - Draft 2008 $PM_{2.5}$ Plan

General Plan Consistency

The Merced Vision 2030 General Plan contains a number of policies that apply to Air Quality impacts in conjunction with ultimate build-out of the City in accordance with the General Plan. The specific policies listed below contained in the Urban Expansion, Urban Design, Land Use, and Sustainable Development Elements are designed to ensure that air quality impacts are minimized as development occurs in accordance with the Merced Vision 2030 General Plan.

Urban Expansion Policies:

UE-1.2 Foster compact and efficient development patterns to maintain a compact urban form.

Urban Design Policies:

UD-1.1 Apply Transit-Ready Development or Urban Village design principles to new development in the City's new growth areas.

UD-1.4 Promote and facilitate Urban Village residential area design principles**.**

Land Use Policies:

L-3.2 Encourage infill development and a compact urban form.

Sustainable Development Policies:

SD-1.1 Accurately determine and fairly mitigate the local and regional air quality impacts of projects proposed in the City of Merced.

SD-1.2 Coordinate local air quality programs with regional programs and those of neighboring jurisdictions.

SD-1.3 Integrate land use planning, transportation planning, and air quality planning for the most efficient use of public resources and for a healthier environment**.**

SD-1.4 Educate the public on the impact of individual transportation, lifestyle, and land use decisions on air quality.

SD-1.5 Provide public facilities and operations which can serve as a model for the private sector in implementation of air quality programs.

SD-1.6 Reduce emissions of PM10, PM2.5, and other particulates with local control potential**.**

SD-3.1 Promote the use of Solar Energy technology and other Alternative Energy Resources**.**

SD-3.2 Encourage the use of energy conservation features, low-emission equipment, and alternative energy sources for all new residential and commercial development.

3.3.2 THRESHOLDS OF SIGNIFICANCE

Adoption of a General Plan Update establishes the parameters within which future development projects will be reviewed and establishes some of the project standards of approval. Growth due to implementation of the General Plan is expected to occur over the span of 20 years or more.

Over the next 20 years, it is also expected that mitigation technology and environmental regulatory frameworks will change. Due to anticipated advances in air quality mitigation techniques, methods, laws, and regulations, it is anticipated the changes will be made in the way that future air quality impacts are assessed.

Future specific development proposals will be evaluated within the context of proposed planning policy. Air quality impacts will be further mitigated using available technology as part of the normal City review process.

Present methods used for evaluating potential Air Quality impacts rely on both qualitative and quantitative analytical techniques. Quantitative techniques are only able to assess expected future growth impacts by using present day assumptions about technology and the regulatory environment. For this reason, quantitative data is provided as a benchmark for evaluating impacts of the proposed City of Merced General Plan.

The SJVAPCD has established thresholds of significance for determining environmental significance. These thresholds separate a project's short-term emissions from its long-term emissions. The short-term emissions are mainly related to the construction phase of a project, which are recognized to be short in duration. The long-term emissions are primarily related to the activities that will occur indefinitely as a result of project operations.

Impacts will be evaluated both on the basis of CEQA Appendix G criteria and SJVAPCD significance criteria.

In order, the impacts to be evaluated will be those involving construction, operational emissions of criteria pollutants (Particulate Matter (PM_{10}) and reactive organic gas precursors to ozone), and cumulative air quality impacts. Because the area is non-attainment for ozone and PM_{10}, a major criteria for review is whether the project will result in a net increase of pollutants impacting ozone precursor pollutants and of PM_{10}.

Where environmental impacts are found to be significant or potentially significant, mitigation measures are identified to mitigate or avoid significant environmental effects.

In addition to the site-specific mitigation measures delineated for this plan, the City shall be required to implement reasonably feasible management practices required by the San Joaquin Valley Air Pollution Control District, or any other federal or state air quality regulatory agency, for the purpose of mitigating any significant impacts from the emission of Particulate Matter, Fine Particulate Matter, Reactive Organic Gases, Nitrogen Oxide, and any other criteria air pollutant or precursor emanating from implementation of the City of Merced General Plan.

Consistent with Appendix G of the CEQA Guidelines, the proposed project is considered to have a significant impact on the environment if it will:

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

standard (including releasing emissions which exceed quantitative thresholds for ozone precursors;

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

Thresholds Used for Odor Evaluation

While odors are considered to be offensive and seldom cause any physical harm to people, they certainly can be unpleasant and lead to considerable amounts of anguish to the public and often leads to complaints made to the local jurisdiction from the community. Any project with the potential to expose the community to offensive odors would be considered a significant impact. Odor impacts on residential areas and sensitive receptors are often closely scrutinized, consideration should be given to other land uses that are commonly used by large amounting of people, such as open space, recreational facilities and commercial centers. The GAMAQI states that an evaluation "should be conducted for both of the following situations: 1) a potential source of objectionable odors is proposed for a location near existing sensitive receptors, and 2) sensitive receptors are proposed to be located near an existing source of objectionable odors."

Thresholds Used for Sensitive Receptors

One of the criteria for significance includes potential impacts of Hazardous Air Pollutants (HAPs) on sensitive receptors. The GAMAQI, Section 3, defines a sensitive receptor as a location where human populations, especially children, seniors, and sick persons are present and where there is a reasonable expectation of continuous human exposure to pollutants. Examples of sensitive receptors include, but are not limited to: residential land uses, schools, hospitals, convalescent homes, and day care centers.

Examples of HAPs include emissions of criteria or toxic air pollutants that have health effects (PM_{10}, ammonia, H_2S sulfur dioxide, etc.). Sensitive receptors would not be directly affected by emissions of regional pollutants such as ozone precursors (VOC and NOx).

The potential for impacts to sensitive receptors can occur when a sensitive receptor is proposed near an existing source of HAPs, or when a development that is a source of HAPs is proposed near sensitive receptors, including siting a source of HAPs near an undeveloped, but designated sensitive receptor land use.

3.3.3 IMPACTS AND MITIGATION MEASURES

Impact #3.3-1: Construction activities associated with development under the Merced Vision 2030 General Plan would result in criteria pollutants, ozone precursors, and other pollutants.

Discussion/Conclusion: Construction activity that would occur as a result of the plan would cause temporary, short-term emissions of various air pollutants. ROG and NOx, which are ozone precursors, as well as PM_{10} and $PM_{2.5}$ and CO_2 (a greenhouse gas) would be emitted by

construction equipment during various activities, such as grading and excavation, infrastructure construction, building demolition, and a variety of other construction activities. Several types of diesel-powered heavy equipment will operate during development of the plan area. It is unknown at this time as to the type of uses; therefore, it is speculative as to the exact type of equipment to be used.

Compliance with the SJVAPCD's Regulation VIII is required during construction phases in plan area. The SJVAPCD indicates that implementation of Regulation VIII measures reduces dust generation by 50 percent. The provisions of Regulation VIII pertaining to construction activities require:

- Effective dust suppression for land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill and demolition activities;

- Effective stabilization of all land disturbed areas of a construction site, including storage piles not used for seven or more days;

- Control of fugitive dust from on-site unpaved roads and off-site unpaved access roads;

- Removal of accumulations of mud or dirt at the end of the work day or once every 24 hours from public paved roads, shoulders and access ways adjacent to the site; and

- Limit traffic speeds on unpaved roads to 15 mph.

These measures will be enforced by the SJVAPCD. Additionally, a Dust Control Plan will be prepared and appropriate fees paid for each development within the plan area. Violation of Regulation VIII requirements are subject to enforcement action. Violations are visible by the generation of dust clouds and/or generation of complaints.

The SJVAPCD has also identified an additional "enhanced control measure" that may be appropriate.

- Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with a slope greater than one percent.

If the "enhanced control measure" will not be implemented for large or sensitive projects, then construction impacts would be considered significant unless the Lead Agency provides a satisfactory detailed explanation as to why a specific measure is unnecessary.

The SJVAPCD has also identified an additional measure that may be implemented if further emission reductions are deemed necessary by the Lead Agency.

- Install windbreaks at windward side(s) of construction areas.

This control measure is strongly encouraged at construction sites that are large in area, located near sensitive receptors, or which for any other reason, warrants additional emissions reductions.

In the absence of Regulation VIII requirements, construction activity could occur on a maximum of 11 acres per day without causing PM_{10} impacts to exceed the threshold of significance. With Regulation VIII in place, the maximum area of construction activity which falls below the threshold of significance rises to approximately 22 acres per day.

As construction activities could occur on areas large enough to exceed the threshold of significance for the generation of fugitive dust, the project will have a ***potentially significant*** impact on the generation of various pollutants (ROG, NO_X, PM_{10}, $PM_{2.5}$ and CO_2).

Mitigation Measure #3.3-1a:

For any phase of construction in which an area greater than 22 acres, in accordance with Regulation VIII of the SJVAPCD, will be disturbed on any one day, the project developer(s) shall implement the following measures:

1. *Basic fugitive dust control measures are required for all construction sites by SJVAPCD Regulation VIII.*

2. *Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with a slope greater than one percent.*

3. *Traffic speeds on unpaved roads shall be no greater than 15 mph.*

4. *Install wind breaks at windward side(s) of construction areas.*

Mitigation Measure #3.3-1b:

To reduce emissions and thus reduce cumulative impacts, the City of Merced shall consider adoption of an ordinance requiring the following measures to be implemented in conjunction with construction projects within the City:

1. *The idling time of all construction equipment used in the plan area shall not exceed ten minutes when practicable.*

2. *The hours of operation of heavy-duty equipment shall be minimized when practicable.*

3. *All equipment shall be properly tuned and maintained in accord with manufacturer's specifications when practicable.*

4. *When feasible, alternative fueled or electrical construction equipment shall be used at the project site.*

5. *The minimum practical engine size for construction equipment shall be used when practicable.*

6. *When feasible, electric carts or other smaller equipment shall be used at the project site.*

7. *Gasoline-powered equipment shall be equipped with catalytic converters when practicable.*

Effectiveness of Mitigation:

Implementation of the mitigation measures above will reduce construction exhaust emissions to a ***less than significant*** level.

Impact #3.3-2: Development and operation under the General Plan would result in emissions of criteria pollutants, ozone precursors, and other pollutants caused by mobile source activity, area sources, and stationary sources.

Discussion/Conclusion: Adoption and implementation of the proposed Merced Vision 2030 General Plan will result in additional development and urbanization in the Planning Area, which would in turn increase criteria air pollutants in an area that is currently designated as a severe non-attainment area.

The City of Merced proposes to: 1) improve infrastructure including streets, parking capacity, curbs, gutters, sidewalks, sewer lines, water lines, drainage systems, and similar improvements to remove blight from the community, 2) assemble adequate sites for construction of industrial facilities, 3) revitalize downtown through demolition and/or rehabilitation of deteriorated structures, and 4) assemble land to promote residential, commercial, and industrial development.

As blighted areas are revitalized, an increase in mobile emissions is expected. It is also expected that any new industrial facilities will increase criteria pollution emissions. Nearly all development projects in the San Joaquin Valley have the potential to generate pollutants that will reduce air quality or make it more difficult for state and national air quality standards to be attained.

The federal and state ambient air quality standards provide a basis for evaluating air quality related impacts (see Table 3.3-6). Exceedance of a federal or state emission standard for any pollutant is a significant impact. Because the state standards set forth under the CAA of 1988 are more restrictive than federal standards, the State standards are typically used for comparison of impacts.

Proposed projects within the City of Merced and unincorporated areas within the proposed SUDP/SOI will be required to comply with the SJVAPCD Guide for Assessing and Mitigating Air Quality Impacts (GAMAQI). The GAMAQI has been developed to provide guidance in quantifying and evaluating whether a proposed project or plan will exceed the thresholds imposed by the SJVAPCD. If a proposed project exceeds the minimum threshold imposed by the SJVAPCD, the project must implement measures to reduce the impacts below the minimum threshold as approved by the City of Merced. In the event that an impact cannot be reduced

below the minimum threshold, the City of Merced must prepare a statement of overriding considerations to be approved by the City Council. The SJVAPCD has established a three-tiered approach to determining significance related to a projects quantified ozone precursor emissions. The following are the tiers established by the SJVAPCD; Small Project Analysis Level (SPAL), Cursory Analysis Level (CAL) and Full Analysis Level (FAL). Each tier requires a progressively more complex methodology in modeling and emissions calculations to determine air quality significance. Additionally, projects will be subject to the SJVAPCD's ISR rules. For projects subject to the rule, operational NOx and PM_{10} emissions must be reduced through onsite measures, an 'off-site fee', or a combination of the two. Application of the ISR requirements will further reduce operational impacts of the proposed General Plan. It is unknown at this time the amount of future development that will be subject to this rule.

Operational emissions (reactive organic gases), including increased mobile emissions and potential industrial emissions constitute a significant project impact as well as a significant cumulative impact. ROGs, NOx, CO, PM_{10} and $PM_{2.5}$, because of the Basin's non-attainment status, constitute ***significant cumulative impacts***.

Mitigation Measures

Mitigation Measure #3.3-2:

The following BACT (Best Available Control Technology) installations and mitigation shall be considered for new discretionary permits, to the extent feasible as determined by the City:

- *Trees shall be carefully selected and located to protect building(s) from energy consuming environmental conditions, and to shade paved areas when it will not interfere with any structures. Trees should be selected to shade paved areas that will shade 50% of the area within 15 years. Structural soil should be used under paved areas to improve tree growth.*

- *If transit service is available to a project site, development patterns and improvements shall be made to encourage its use. If transit service is not currently available, but is planned for the area in the future, easements shall be reserved to provide for future improvements such as bus turnouts, loading areas, route signs and shade structures.*

- *Multi-story parking facilities shall be considered instead of parking lots to reduce exposed concrete surface and save green space.*

- *Sidewalks and bikeways shall be installed throughout as much of any project as possible, in compliance with street standards, and shall be connected to any nearby existing and planned open space areas, parks, schools, residential areas, commercial areas, etc., to encourage walking and bicycling.*

- *Projects shall encourage as many clean alternative energy features as possible to promote energy self-sufficiency. Examples include (but are not limited to): photovoltaic cells, solar thermal electricity systems, small wind turbines, etc. Rebate and incentive programs are offered for alternative energy equipment.*

As many energy-conserving features as possible shall be included in the individual projects. Energy conservation measures include both energy conservation through design and operational energy conservation. Examples include (but are not limited to):

- *Increased energy efficiency (above California Title 24 Requirements)*
- *Energy efficient widows (double pane and/or Low-E)*
- *Use Low and No-VOC coatings and paints*
- *High-albedo (reflecting) roofing material*
- *Cool Paving. "Heat islands" created by development projects contribute to the reduced air quality in the valley by heating ozone precursors*
- *Radiant heat barrier*
- *Energy efficient lighting, appliances, heating and cooling systems*
- *Install solar water-heating system(s)*
- *Install photovoltaic cells*
- *Install geothermal heat pump system(s)*
- *Programmable thermostat(s) for all heating and cooling systems*
- *Awnings or other shading mechanism for windows*
- *Porch, patio and walkway overhangs*
- *Ceiling fans, whole house fans*
- *Utilize passive solar cooling and heating designs (e.g. natural convection, thermal flywheels)*
- *Utilize daylighting (natural lighting) systems such as skylights, light shelves, interior transom windows, etc.*
- *Electrical outlets around the exterior of the unit(s) to encourage use of electric landscape maintenance equipment*

- *Bicycle parking facilities for patrons and employees in a covered secure area. Bike storage should be located within 50' of the project's entrance. Construct paths to connect the development to nearby bikeways or sidewalks*

- *On-site employee cafeterias or eating areas*

- *Low or non-polluting landscape maintenance equipment (e.g. electric lawn mowers, reel mowers, leaf vacuums, electric trimmers and edger's, etc.)*

- *Pre-wire the unit(s) with high speed modem connections/DSL and extra phone lines*

- *Natural gas fireplaces (instead of wood-burning fireplaces or heaters)*

- *Natural gas lines (if available) and electrical outlets in backyard or patio areas to encourage the use of gas and/or electric barbecues*

- *Low or non-polluting incentives items should be provided with each residential unit (such items could include electric lawn mowers, reel mowers, leaf vacuums, gas or electric barbecues, etc.)*

Effectiveness of Mitigation:

The above mitigation measures would reduce project air quality impacts, but not below the SJVAPCD thresholds of significance; therefore, project impacts on air quality would be ***significant, cumulative, and unavoidable***.

Impact #3.3-3: Development and Operation under the General Plan would Expose Sensitive Receptors to Pollutant Concentration.

Discussion/Conclusion: Adoption of the proposed General Plan will result in additional development and urbanization in the Planning Area, which may result in the location of sensitive receptors near HAPs sources, or result in a CO hotspot.

Large sources of HAPs are required to obtain permits from the SJVAPCD and comply with emissions controls to limit the release of HAPs. The SJVAPCD will not issue permits for a source of HAPs if analysis shows that the emissions would cause a significant impact to the nearest sensitive receptor. In addition to the SJVAPCD's Air Toxics Program, the proposed General Plan contains policies to reduce operational impacts in the Merced area.

CO hotspots are temporary and localized areas of high CO concentration, occurring at heavily congested intersections or roadways with heavy traffic. The proposed General Plan contains policies to reduce vehicle miles traveled (VMT) and promote alternative modes of transportation, thereby reducing CO hotspots.

The potential for HAPs impacts primarily results from situating sensitive receptors near sources of HAPs or situating HAPs sources near sensitive receptors. Potential impacts could also result

from an emissions release in violation with SJVAPCD permitting requirements. Increased vehicular traffic could be a source of concern for CO impacts.

The HAPs impacts will be reduced through mitigation measures listed above. Analysis, such as a Health Risk Assessment, may be required on an individual project basis, as specific projects are proposed. However, additional analysis is not feasible at this time, as no specific project is proposed.

The CO impacts of future developments will be lessened by the SJVAPCD and policies of the proposed General Plan's that promote the use of alternative transportation, air quality mitigation for new developments, and strategies to minimize the number and length of vehicle trips. Per the GAMAQI's screening criteria, further analysis is required if the LOS is reduced to an E or an F on any roadway intersection or segment.

Impacts from CO and HAPs for the proposed project are ***less than significant***.

Mitigation Measures

No mitigation measures are required.

Impact #3.3-4: Implementation of the General Plan Update Would Create Odor Impacts

Discussion/Conclusion: Construction activity will require the operation of equipment which may generate exhaust from either gasoline or diesel fuel. Construction of new buildings will also require the application of architectural coatings and the paving of roads which would generate odors from materials such as paints and asphalt. These odors are of a temporary or short-term nature and quickly disperse into the surrounding atmosphere, thus, these are not significant.

Future residential development will also involve minor, odor-generating activities, such as backyard barbeque smoke, garden equipment exhaust, and the application of exterior paint for home improvement activities. These types of odors are typical of most residential communities and are not considered significant generators of odor impacts.

Specific industrial uses in the plan area are currently unknown, however; future uses shall be subject to General Plan policies to mitigate objectionable odors. Policies such as requiring new developments to be located, designed, and constructed in a manner that would minimize cumulative air quality impacts; considering effects upon sensitive receptors; by preventing incompatible uses; and promoting flexibility and innovation through the use of PUDs, development agreements, specific plans, mixed-use projects, and other innovative development and planning techniques.

The City's General Plan includes policies that address air quality impacts, including odor generation; therefore, with implementation of these policies, this impact is considered ***less than significant.***

Mitigation Measures

No mitigation measures are required.

CUMULATIVE IMPACT ANALYSIS

Implementation of the proposed General Plan in combination with other reasonably foreseeable projects as planned for in the SJVAPCD would increase the density of development throughout the SJVAPCD and could further reduce air quality within the SJVAPCD. The SJVAPCD and other air quality analysis have recognized that population growth increases can potentially reduce air quality further without proper measures to better air quality in the region. However, the degree of probability is unknown as such cumulative impacts, if any, would be difficult to measure. Over recent decades, development in the SJVAPCD as well as the City of Merced has converted thousands of acres to urban uses. Thousands more of additional acres are proposed for development in the SJVAPCD in addition to the proposed City of Merced SUDP/SOI area. Such development could further reduce air quality in the SJVAPCD. Additionally, road construction, site grading, infrastructure installation, and construction of residential, commercial, and public facilities uses as well as the additional traffic created by these activities could result in increased significant impacts to air quality in the region. Most of the land that has been or is planned for development in SJVAPCD is made up of property similar to the proposed undeveloped lands within the proposed City of Merced SUDP/SOI.

Although individual project impacts can be mitigated, based on the standards of significance, the cumulative impacts of development in accordance with the proposed General Plan and other projects and plans within the SJVAPCD are significant, and the project's incremental contribution to this impact is itself is cumulatively considerable.

Cumulative air quality impacts were considered in terms of the various land uses proposed under the General Plan and the traffic projections generated by the traffic model. Because of the existing significant air quality issues in the San Joaquin Valley Air Basin, implementation of the 2030 General Plan Update would result in a ***significant, unavoidable and cumulatively considerable*** air quality impact.