4.2 AIR QUALITY

This section includes a description of existing air quality conditions, summary of applicable regulations, and an analysis of potential short-term and long-term air quality impacts of the proposed project. The method of analysis for short-term construction, long-term regional (operational), local mobile source, odor, and toxic air contaminant (TAC) emissions in accordance with the recommendations of the San Joaquin Valley Air Pollution Control District (SJVAPCD). The analysis also includes consideration of the potential impact of the project on global climate change through the production of greenhouse gas emissions. In addition, mitigation measures are recommended, as necessary, to reduce significant air quality impacts.

4.2.1 ENVIRONMENTAL SETTING

The project site is located in Merced County, which is within the San Joaquin Valley Air Basin (SJVAB). The SJVAB also comprises all of Fresno, Kings, Madera, San Joaquin, Stanislaus, and Tulare counties, and the valley portion of Kern. The ambient concentrations of air pollutant emissions are determined by the amount of emissions released by pollutant sources and the atmosphere's ability to transport and dilute such emissions. Natural factors which affect transport and dilution include terrain, wind, atmospheric stability, and the presence of sunlight. Therefore, existing air quality conditions in the area are determined by such natural factors as topography, meteorology, and climate, in addition to the amount of emissions released by existing air pollutant sources, as discussed separately below.

TOPOGRAPHY, METEOROLOGY, AND CLIMATE

The SJVAB, which occupies the southern half of the Central Valley, is approximately 400 miles long (north-south) and, on average, 50 miles wide (east-west). The SJVAB is a well-defined climatic region, with distinct topographic features on three sides. The Coast Ranges, which have an average elevation of 3,000 feet, are located on the western border of the SJVAB. The San Emigdio Mountains, which are part of the Coast Ranges, and the Tehachapi Mountains, which are part of the Sierra Nevada, are both located on the south side of the SJVAB. The Sierra Nevada forms the eastern border of the SJVAB. The northernmost portion of the SJVAB is San Joaquin County. There is no topographic feature delineating the northern edge of the basin. The SJVAB is basically flat with a downward gradient in terrain to the northwest. Air flows into the SJVAB through the Carquinez Strait, the only breach in the western mountain barrier, and moves across the Sacramento–San Joaquin River Delta from the San Francisco Bay area. The mountains surrounding the SJVAB create a barrier to airflow, which leads to the entrapment of air pollutants when meteorological conditions are unfavorable for transport and dilution.

The inland Mediterranean climate type of the SJVAB is characterized by hot, dry summers and cool, rainy winters. The climate is a result of the topography and the strength and location of a semi-permanent, subtropical high-pressure cell. During summer, the Pacific high-pressure cell is centered over the northeastern Pacific Ocean, resulting in stable meteorological conditions and a steady northwesterly wind flow. Upwelling of cold ocean water from below to the surface as a result of the northwesterly flow produces a band of cold water off the California coast. Daily summer high temperatures often exceed 100º F, averaging in the low 90s in the north and high 90s in the south. In the entire SJVAB, daily summer high temperatures average 95º F. Over the last 30 years, temperatures in the SJVAB averaged 90º F or higher for 106 days a year, and 100º F or higher for 40 days a year. The daily summer temperature variation can be as high as 30º F (SJVAPCD 2002). In winter, the Pacific high-pressure cell weakens and shifts southward, resulting in wind flow offshore, the absence of upwelling, and the occurrence of storms. Average high temperatures in the winter are in the 50s, but lows in the 30s and 40s can occur on days with persistent fog and low cloudiness. The average daily low winter temperature is 45º F (SJVAPCD 2002).

A majority of the precipitation in the SJVAB occurs as rainfall during winter storms. The rare occurrence of precipitation during the summer is in the form of convective rain showers. The amount of precipitation in the SJVAB decreases from north to south primarily because of the Pacific storm track that often passes through the

northern part while the southern part remains protected by the Pacific high-pressure cell. Stockton in the north receives about 20 inches of precipitation per year, Fresno in the center receives about 10 inches per year, and Bakersfield at the southern end of the valley receives less than 6 inches per year. Average annual rainfall for the entire SJVAB is approximately 9.25 inches on the valley floor (SJVAPCD 2002).

The winds and unstable atmospheric conditions associated with the passage of winter storms result in periods of low air pollution and excellent visibility. Precipitation and fog tend to reduce or limit some pollutant concentrations. For instance, clouds and fog block sunlight, which is required to fuel photochemical reactions that form ozone. Because carbon monoxide (CO) is partially water-soluble, precipitation and fog also tend to reduce concentrations in the atmosphere. In addition, respirable particulate matter with an aerodynamic diameter of 10 micrometers or less (PM_{10}) can be washed from the atmosphere through wet deposition processes (e.g., rain). However, between winter storms, high pressure and light winds lead to the creation of low-level temperature inversions and stable atmospheric conditions resulting in the concentration of air pollutants (e.g., CO and PM_{10}).

Summer is considered the ozone season in the SJVAB. This season is characterized by poor air movement in the mornings and longer daylight hours which provides a plentiful amount of sunlight to fuel photochemical reactions between reactive organic gases (ROG) and nitrogen oxides (NO_X), which result in ozone formation. During the summer, wind speed and direction data indicate that summer wind usually originates at the north end of the San Joaquin Valley and flows in a south-southeasterly direction through the San Joaquin Valley, through Tehachapi pass, and into the Southeast Desert Air Basin (SJVAPCD 2002).

OZONE TRANSPORT

Ozone transport refers to the movement of ozone and precursors from other basins to the SJVAB, from the SJVAB to other air basins, and within the SJVAB. Transport can occur at ground level and also at higher altitudes (e.g., movement up mountain slopes during the day).

According to the SJVAB Extreme Ozone Attainment Demonstration Plan, the transport of pollutants within the SJVAB significantly contributes to high ozone concentrations (SJVAPCD 2005). As discussed above, prevailing winds blow from the northern part of the SJVAB to the south, and can transport pollutants from San Joaquin, Stanislaus, and Merced counties to the Fresno area. Pollutants transported from the San Francisco Bay area south to Fresno and Bakersfield are combined with those in the northern portion of the SJVAB because of the passage of air movement. Further south, eddy currents can transport pollutants along the east side of the SJVAB from Tulare County and northern Kern County to the Fresno area.

Ozone and precursors are transported from other basins to the SJVAB. On some days, according to an California Air Resources Board (ARB) assessment of ozone transport, pollutants transported from the San Francisco Bay area affect ozone air quality in the northern SJVAB, mixing with local emissions to contribute to violations of the national 1-hour ozone standard[1] (ARB 2001). On other days, violations of the standard are entirely from local emissions. The effect of San Francisco Bay area transport diminishes with distance so that ambient ozone concentrations in Fresno and Bakersfield are affected less. Overall, ARB rates the San Francisco Bay area's impact on SJVAB ozone air quality as ranging from inconsequential to overwhelming (i.e., alone can cause violations) depending on meteorological conditions occurring at the time of transport evaluation and in the receptor area. ARB also identifies the broader Sacramento area as a source of ozone and precursor transport to the SJVAB, but the effect only ranges from significant (i.e., contributes to a violation when combined with local emissions) to inconsequential. ARB's assessment of ozone transport found that pollutants transported from other air basins affect the SJVAB's ozone air quality, but the magnitude of the effect declines from north to south (ARB 2001). Local emissions are thought to be primarily responsible for the SJVAB's worst ozone air quality.

EXISTING AIR QUALITY—CRITERIA AIR POLLUTANTS

Concentrations of the following air pollutants: ozone, CO, nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable and fine particulate matter (PM_{10} and $PM_{2.5}$), and lead are used as indicators of ambient air quality conditions. 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."

A brief description of each criteria air pollutant including source types, health effects, and future trends is provided below along with the most current attainment area designations and monitoring data for the project area.

Ozone

Ozone is a photochemical oxidant, a substance whose oxygen combines chemically with another substance in the presence of sunlight, and the primary component of smog. Ozone is not directly emitted into the air, but is formed through complex chemical reactions between precursor emissions of ROG and NO_X 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.

Ozone located in the upper atmosphere (stratosphere) acts in a beneficial manner by shielding the earth from harmful ultraviolet radiation that is emitted by the sun. However, ozone located in the lower atmosphere (troposphere) is a major health and environmental concern. Meteorology and terrain play a major role in ozone formation. Generally, low wind speeds or stagnant air coupled with warm temperatures and clear skies provide the optimum conditions for formation. As a result, summer is generally the peak ozone season. Because of the reaction time involved, peak ozone concentrations often occur far downwind of the precursor emissions. Therefore, ozone is a regional pollutant that often affects large areas. In general, ozone concentrations over or near urban and rural areas reflect an interplay of emissions of ozone precursors, transport, meteorology, and atmospheric chemistry (Godish 2004).

The adverse health effects associated with exposure to ozone pertain primarily to the respiratory system. Scientific evidence indicates that ambient levels of ozone affect not only sensitive receptors, such as asthmatics and children, but healthy adults as well. Exposure to ambient levels of ozone ranging from 0.10 to 0.40 parts per million (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 ozone 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 ozone 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 (Godish 2004). Ground level ozone also damages forests, agricultural crops, and some human-made materials, such as rubber, paint, and plastics (City of Merced 1997).

Emissions of ozone precursors ROG and NO_X have decreased over the past several years because of more stringent motor vehicle standards and cleaner burning fuels. The ozone problem in the San Joaquin Valley ranks among the most severe in the State. Peak levels have not declined as much as the number of days that standards are exceeded. From 1985 to 2004, the maximum peak 8-hour indicator decreased only 2%. The number of national 8-hour standard exceedance days has been quite variable over the years. This variability is due, in part, to the influence of meteorology as well as changes to the monitoring network. The monitoring network was not as extensive during the 1980's as it has been during the last 14 years. For this reason, the period of 1990 to 2005 provides a better indication of trends. During this period, there has been an 8% decrease in the three-year average of the number of exceedance days of the national 8-hour standard (ARB 2006x).

Carbon Monoxide

CO is a colorless, odorless, and poisonous gas produced by incomplete burning of carbon in fuels, primarily from mobile (transportation) sources. In fact, 77% of the nationwide CO emissions are from mobile sources. The other 23% 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 (EPA 2006x).

The highest concentrations are generally associated with cold stagnant weather conditions that occur during the winter. In contrast to ozone, which tends to be a regional pollutant, CO problems tend to be localized.

Nitrogen Dioxide

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 (EPA 2006x). The combined emissions of NO and NO_2 are referred to as NO_X, which are reported as equivalent NO_2. Because NO_2 is formed and depleted by reactions associated with photochemical smog (ozone), the NO_2 concentration in a particular geographical area may not be representative of the local NO_X 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.

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.

Particulate Matter

Respirable particulate matter with an aerodynamic diameter of 10 micrometers or less is referred to as PM_{10}. PM_{10} consists of particulate matter emitted directly into the air, such as fugitive dust, soot, and smoke from mobile and stationary sources, construction operations, fires and natural windblown dust, and particulate matter formed in the atmosphere by condensation and/or transformation of SO_2 and ROG (EPA 2006x). Fine particulate matter ($PM_{2.5}$) includes a subgroup of smaller particles that have an aerodynamic diameter of 2.5 micrometers or less (ARB 2006x).

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 adsorbed 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 concentrations and may include breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, alterations to the immune system, carcinogenesis, and premature death (EPA 2006x). $PM_{2.5}$ poses an increased health risk because the particles can deposit deep in the lungs and may contain substances that are particularly harmful to human health.

Direct emissions of PM_{10} have remained relatively unchanged between 1975 and 2005 and are projected to remain unchanged through 2020. PM_{10} emissions in the San Joaquin Valley are dominated by emissions from areawide sources, primarily fugitive dust from vehicle travel on unpaved and paved roads, waste burning, and residential fuel combustion. Direct emissions of $PM_{2.5}$ decreased from 1975 to 2005 and are projected to continue decreasing through 2020. $PM_{2.5}$ emissions in the San Joaquin Valley are dominated by emissions from areawide sources, primarily fugitive dust from vehicle travel on unpaved and paved roads, waste burning, and residential fuel combustion (ARB 2006x).

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 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, the U.S. Environmental Protection Agency (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 (EPA 2006x).

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% between 1980 and 1999. Transportation sources, primarily airplanes, now contribute only 13% of lead emissions. A recent National Health and Nutrition Examination Survey reported a 78% 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 (EPA 2006x).

The decrease in lead emissions and ambient lead concentrations over the past 25 years is California's most dramatic success story. 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 ARB 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 (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, ARB identified lead as a toxic air contaminant.

Emissions Inventory

Table 4.2-1 summarizes emissions of criteria air pollutants within Merced County for various source categories. According to Merced County's emissions inventory, mobile sources are the largest contributor to the estimated annual average air pollutant levels of CO and NO_X accounting for approximately 57% and 78%, respectively, of the total emissions. Areawide sources account for approximately 58%, 91%, and 85% of the County's ROG, PM_{10} and $PM_{2.5}$ emissions, respectively. Stationary sources account for approximately 67% of the County's oxides of sulfur emissions.

Table 4.2-1
Summary of 2005 Estimated Emissions Inventory for Merced County

Source Type/Category	Estimated Annual Average Emissions (Tons per Day)					
	ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$
Stationary Sources						
Fuel Combustion	0.55	11.25	3.33	0.79	0.24	0.24
Waste Disposal	0.02	0.00	0.00	–	0.00	0.00
Cleaning and Surface Coating	1.17	–	–	–	–	—
Petroleum Production and Marketing	0.62	–	–	–	–	–
Industrial Processes	1.57	0.62	3.10	0.08	1.71	0.90
Subtotal (Stationary Sources)	3.93	11.87	6.43	0.87	1.96	1.13
Areawide Sources						
Solvent Evaporation	5.02	–	–	–	–	–
Miscellaneous Processes	13.02	60.60	0.92	0.04	30.70	11.19
Subtotal (Areawide Sources)	18.04	60.60	0.92	0.04	30.70	11.19
Mobile Sources						
On-Road Motor Vehicles	6.67	78.33	15.98	0.12	0.48	0.34
Other Mobile Sources	2.55	16.35	9.98	0.28	0.63	0.57
Subtotal (Mobile Sources)	9.22	94.68	25.96	0.40	1.11	0.92
Grand Total for Merced County	31.19	167.15	33.31	1.30	33.77	13.24

Notes: ROG = reactive organic gases; CO = carbon monoxide; NO_X = oxides of nitrogen; SO_X = oxides of sulfur; PM_{10} = respirable particulate matter; $PM_{2.5}$ = fine particulate matter
Source: ARB 2007x

Monitoring Station Data and Attainment Area Designations

Criteria air pollutant concentrations are measured at several monitoring stations in the SJVAB. The monitoring station closest to the proposed project site is located just west of the project site at 385 South Coffee Avenue and measures ozone and NO_2. The closest monitoring station that measures PM_{10} and $PM_{2.5}$ is located at 2334 M Street, which is approximately 3.7 miles northwest of the project site. Table 4.2-2 summarizes the air quality data from these two stations for the most recent 4 years, 2003 through 2006. The data is not necessarily representative of the project site, because of the distance from the monitor to the site and the monitor location was meant to measure the highest urban ozone concentrations (SJVAPCD 2005).

Both ARB and EPA use this type of monitoring data to designate areas according to attainment status for criteria air pollutants established by the agencies. The purpose of these 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 designation is given to nonattainment areas that are progressing and nearing attainment. The most current attainment designations for the Merced County portion of the SJVAB are shown in Table 4.2-3 for each criteria air pollutant.

Table 4.2-2
Summary of Annual Ambient Air Quality Data (2003–2006) – Merced Stations[1]

	2005	2006	2007
Ozone			
Maximum concentration (1-hr/8-hr, ppm)	0.100/0.093	0.102/0.091	0.105/0.096
Number of days state standard exceeded (1-hr)	6	4	5
Number of days national standard exceeded (1-hr/8-hr)	0/20	0/23	0/18
Nitrogen Dioxide (NO_2)			
Maximum concentration (1-hr, ppm)	0.062	0.062	0.050
Number of days state standard exceeded (1-hr)	0	0	0
Annual Average (ppm)	0.011	0.010	0.009
Fine Particulate Matter ($PM_{2.5}$)			
Maximum concentration ($\mu g/m^3$)	54	56	82
Number of days national standard exceeded (measured[2])	1	1	1
Respirable Particulate Matter (PM_{10})			
Maximum concentration ($\mu g/m^3$)	75	98	69
Number of days state standard exceeded (calculated[2])	29	47.4	36.5
Number of days national standard exceeded (calculated[2])	0	0	0

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

[1] Measurements of ozone and NO_2 are from the Coffee Avenue station, and measurements of PM_{10} and $PM_{2.5}$ are from the M Street station.

[2] Measured days are those days that an actual measurement was greater than the level of the state daily standard or the national daily standard. Measurements are typically collected every 6 days. Calculated days are the estimated number of days that a measurement would have been greater than the level of the standard had measurements been collected every day. The number of days above the standard is not necessarily the number of violations of the standard for the year.

Sources: ARB 2008x, EPA 2006x

Table 4.2-3
Ambient Air Quality Standards and Merced County Attainment Status

Pollutant	Averaging Time	California		National Standards [1]		
		Standards [2,3]	Attainment Status [4]	Primary [3,5]	Secondary [3,6]	Attainment Status [7]
Ozone	1-hour	0.09 ppm (180 µg/m^3)	N (Severe)	-[9]	-	-
	8-hour	0.070 ppm[8] (137 µg/m^3)	N	0.075 ppm (147 µg/m^3)	Same as Primary Standard	N(Serious)
Carbon Monoxide (CO)	1-hour	20 ppm (23 mg/m^3)	U[11]	35 ppm (40 mg/m^3)	–	U/A
	8-hour	9 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)		
Nitrogen Dioxide (NO_2)[12]	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)	–	0.053 ppm (100 µg/m^3)	Same as Primary Standard	U/A
	1-hour	0.18 ppm (339 µg/m^3)	A	–		–
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	–	–	0.030 ppm (80 µg/m^3)	–	U
	24-hour	0.04 ppm (105 µg/m^3)	A	0.14 ppm (365 µg/m^3)	–	
	3-hour	–	–	–	0.5 ppm (1300 µg/m^3)	
	1-hour	0.25 ppm (655 µg/m^3)	A	–	–	–
Respirable Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 µg/m^3	N(Serious)	–[13]	Same as Primary Standard	A [14]
	24-hour	50 µg/m^3		150 µg/m^3		
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 µg/m^3	N[15]	15 µg/m^3	Same as Primary Standard	N
	24-hour	–	–	35 µg/m^3		
Lead[10]	30-day Average	1.5 µg/m^3	A	–	–	–
	Calendar Quarter	–	–	1.5 µg/m^3	Same as Primary Standard	
	Rolling 3-Month Average	–		0.15 µg/m^3		
Sulfates	24-hour	25 µg/m^3	A	**No National Standards**		
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m^3)	U			
Vinyl Chloride[10]	24-hour	0.01 ppm (26 µg/m^3)	A			

Table 4.2-3
Ambient Air Quality Standards and Merced County Attainment Status

Pollutant	Averaging Time	California		National Standards [1]		
		Standards [2,3]	Attainment Status [4]	Primary [3,5]	Secondary [3,6]	Attainment Status [7]
Visibility-Reducing Particle Matter	8-hour	Extinction coefficient of 0.23 per kilometer — visibility of 10 miles or more (0.07—30 miles or more for Lake Tahoe) because of particles when the relative humidity is less than 70%.	U			

[1] National standards (other than ozone, PM, and those based on annual averages or annual arithmetic means) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. The PM_{10} 24-hour standard is attained when 99% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. The $PM_{2.5}$ 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact EPA for further clarification and current federal policies.

[2] California standards for ozone, CO (except Lake Tahoe), SO_2 (1- and 24-hour), NO_2, PM, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations. The California ambient air quality standard for NO_2 was amended on February 22, 2007 to lower the 1-hour standard to 0.18 ppm and establish a new annual standard of 0.030 ppm.

[3] Concentration expressed first in units in which it was promulgated [i.e., parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$)]. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[4] Unclassified (U): a pollutant is designated unclassified if the data are incomplete and do not support a designation of attainment or nonattainment.
Attainment (A): a pollutant is designated attainment if the state standard for that pollutant was not violated at any site in the area during a 3-year period.
Nonattainment (N): a pollutant is designated nonattainment if there was a least one violation of a state standard for that pollutant in the area.
Nonattainment/Transitional (NT): is a subcategory of the nonattainment designation. An area is designated nonattainment/transitional to signify that the area is close to attaining the standard for that pollutant.

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

[6] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[7] Nonattainment (N): any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant.

Attainment (A): any area that meets the national primary or secondary ambient air quality standard for the pollutant.

Unclassifiable (U): any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant.

[8] This concentration effective May 17, 2006.

[9] The 1-hour ozone NAAQS was revoked on June 15, 2005.

[10] ARB has identified lead and vinyl chloride as toxic air contaminants with no threshold 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.

[11] Designation for Merced County; the designation is different for one or more other counties in the SJVAB.

[12] The CAAQS were amended on February 22, 2007, to lower the 1-hour standard to 0.18 ppm and establish a new annual standard of 0.03 ppm. These changes become effective after regulatory changes are submitted and approved by the Office of Administrative Law, expected later this year.

[13] Because of a lack of evidence linking health problems to long-term exposure to coarse particle pollution, EPA revoked the annual PM10 standard on September 21, 2006.

[14] On September 25, 2008, EPA redesignated the San Joaquin Valley to attainment for the PM10 NAAQS and approved the PM10 Maintenance Plan.

[15] The SJVAB is designated nonattainment for the 1997 PM 2.5 federal standards. EPA designations for the 2006 PM 2.5 standards will be finalized in December 2009. The District has determined, as of the 2004-06 PM 2.5 data, that the Valley has attained the 1997 24-Hour PM 2.5 standard.

[16] National lead standard, rolling 3-month average: final rule signed October 15, 2008.

Source: SJVAPCD 2006x; ARB 2008x, 2006d; SJVAPCD 2008

EXISTING AIR QUALITY—TOXIC AIR CONTAMINANTS

Concentrations of TACs are also used as indicators of ambient-air-quality conditions. A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations.

According to the 2005 edition of the California Almanac of Emissions and Air Quality (ARB 2006x), the majority of the estimated health risk from TACs can be attributed to relatively few compounds, the most important being PM from diesel-fueled engines (diesel PM). Diesel PM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances. Although diesel PM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emission control system is present. Unlike the other TACs, no ambient monitoring data are available for diesel PM because no routine measurement method currently exists. However, ARB has made preliminary concentration estimates based on a PM exposure method. This method uses ARB emissions inventory's PM_{10} database, ambient PM_{10} monitoring data, and the results from several studies to estimate concentrations of diesel PM. In addition to diesel PM, benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, *para*-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene pose the greatest existing ambient risk, for which data are available, in California.

Diesel PM poses the greatest health risk among these ten TACs mentioned. Based on receptor modeling techniques, ARB estimated the diesel PM health risk in 2000 to be 390 excess cancer cases per million people in the SJVAB. Since 1990, the health risk caused by diesel PM in the SJVAB has been reduced by 50%. Overall, levels of most TACs have gone down since 1990 except for *para*-dichlorobenzene and formaldehyde (ARB 2006x).

Existing Sources of TACs

Existing sources in the project vicinity include mobile-source emissions from surrounding freeways, McLane Pacific Grocery, and Central Valley Processing. Stationary TAC emission sources associated with McLane Pacific Grocery and Central Valley Processing may include boilers, backup emergency diesel generators, and above-ground fuel storage. According to ARB, there are no major existing stationary sources of TACs near the project site (ARB 2007x).

Naturally Occurring Asbestos

Naturally occurring asbestos may be found in at least 44 of California's 58 counties. Asbestos is the name for a group of naturally occurring silicate minerals. Exposure to asbestos may result in inhalation or ingestion of asbestos fibers, which over time may result in damage to the lungs or membranes that cover the lungs, leading to illness or even death.

According to the *General Location Guide for Ultramafic Rocks in California—Areas More Likely to Contain Naturally Occurring Asbestos* (Churchill and Hill 2000), the project site and off-site program elements are not located in areas that are more likely to contain naturally occurring asbestos.

EXISTING AIR QUALITY – ODORS

Typically, odors are generally regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell very minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor and in fact an odor that is offensive to one person may be perfectly acceptable to another (e.g., fast food restaurant). It is important to also note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word strong to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air. When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

There are no discrete sources of odor in the vicinity of the project site. The agricultural lands located to the south and east of the project site do include dairy cattle, livestock, or other operations that involve large quantities of animal waste. The facilities operated by McLane Pacific Grocery and Central Valley Processing north of the project site sometimes harbor high volumes of diesel trucks. Exhaust odors from diesel engines operating at these nearby facilities were not noticeable during the 1-day site visit to the proposed project site. Typically, exhaust odors from diesel engines disperse rapidly with distance from the source.

EXISTING AIR QUALITY—GREENHOUSE GASES AND LINKS TO GLOBAL CLIMATE CHANGE

Various gases in the earth's atmosphere, classified as atmospheric greenhouse gases (GHGs), play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space. A portion of the radiation is absorbed by the earth's surface, and a smaller portion of this radiation is reflected back toward space. This absorbed radiation is then emitted from the earth, not as high-frequency solar radiation, but lower frequency infrared radiation. The frequencies at which bodies emit radiation are proportional to temperature. The earth has a much lower temperature than the sun; therefore, the earth emits lower frequency radiation. Most solar radiation passes through GHGs; however, infrared radiation is absorbed by these gases. As a result, radiation that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the Greenhouse Effect, is responsible for maintaining a habitable climate on Earth. Without the Greenhouse Effect, Earth would not be able to support life as we know it.

Prominent GHGs contributing to the Greenhouse Effect are carbon dioxide (CO_2), methane (CH_4), ozone, nitrous oxide, hydrofluorocarbons, chlorofluorocarbons, and sulfur hexafluoride. Human-caused emissions of these GHGs in excess of natural ambient concentrations are responsible for intensifying the Greenhouse Effect and have led to a trend of unnatural warming of the earth's climate, known as global climate change or global warming (Ahrens 2003). It is *extremely unlikely* that global climate change of the past 50 years can be explained without the contribution from human activities (Intergovernmental Panel on Climate Change [IPCC] 2007). Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors (CEC 2006x). In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation (CEC 2006x). Emissions of CO_2 are byproducts of fossil fuel combustion. Methane, a highly potent GHG, results from off-gassing (the release of chemicals from nonmetallic substances under ambient or greater pressure conditions) associated with agricultural practices and landfills. CO_2 sinks, or reservoirs, include vegetation and the ocean, which absorb CO_2 through sequestration and dissolution, respectively, two of the most common processes of CO_2 sequestration.

Climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and TACs, which are pollutants of regional and local concern. Whereas pollutants with localized air quality effects have relatively short atmospheric lifetimes (about 1 day), GHGs have long atmospheric lifetimes (1 year to several thousand years). GHGs persist in the atmosphere for long enough time periods to be dispersed around the globe. Although the exact lifetime of any particular GHG molecule is dependent on multiple variables and cannot be pinpointed, it is understood that more CO_2 is emitted into the atmosphere than is sequestered by ocean uptake, vegetation, and other forms of sequestration. Of the total annual human-caused CO_2 emissions, approximately 54% is sequestered through ocean uptake, uptake by northern hemisphere forest regrowth, and other terrestrial sinks within a year, whereas the remaining 46% of human-caused CO_2 emissions remains stored in the atmosphere (Seinfeld and Pandis 1998).

Similarly, impacts of GHGs are borne globally, as opposed to localized air quality effects of CAPs and TACs. The quantity of GHGs that it takes to ultimately result in climate change is not precisely known; suffice to say, the quantity is enormous, and no single project alone would be expected to measurably contribute to a noticeable incremental change in the global average temperature, or to global, local, or micro climate. From the standpoint of CEQA, GHG impacts to global climate change are inherently cumulative.

Atmospheric Persistence in the Global Carbon Cycle

Unlike diurnal criteria air pollutants such as ozone, CO_2 emissions persist in the atmosphere for much longer periods, on the order of tens to hundreds of years. Although the exact lifetime of any particular CO_2 molecule is dependent on multiple variables and cannot be pinpointed, it is understood that more CO_2 is emitted into the atmosphere than is sequestered by ocean uptake, vegetation, and other forms of sequestration. Of the total annual human-caused CO_2 emissions, approximately 54% is sequestered through ocean uptake, uptake by northern hemisphere forest regrowth, and other terrestrial sinks within a year, whereas the remaining 46% of human-caused CO_2 emissions remains stored in the atmosphere (Seinfeld and Pandis 1998).

Feedback Mechanisms and Uncertainty

Many complex mechanisms interact within Earth's energy budget to establish the global average temperature and global and regional climate conditions. For example, increases in atmospheric temperature would lead to increases in ocean temperature. As atmospheric and ocean temperatures increase, sea ice and glaciers are expected to melt, adding more fresh water to the ocean and altering salinity conditions. Both increases in ocean temperature and changes in salinity would be expected to lead to changes in circulation of ocean currents. Changes in current circulation would further alter ocean temperatures and alter terrestrial climates where currents have changed. Several interacting atmospheric, climatic, aquatic, and terrestrial factors affecting global climate change are described below. These factors result in feedback mechanisms that could potentially increase or decrease the effects of global climate change. There is uncertainty about how some factors may affect global climate change because they have the potential to both intensify and neutralize future climate warming. Examples of these conditions are described below.

Direct and Indirect Aerosol Effects

Aerosols, including particulate matter, reflect sunlight back to space. As air quality goals for particulate matter are met and fewer emissions of particulate matter occur, the cooling effect of aerosols would be reduced, and the Greenhouse Effect would be further intensified. Similarly, aerosols act as cloud condensation nuclei, aiding in cloud formation and increasing cloud lifetime. Under some circumstances (see discussion of the cloud effect below), clouds efficiently reflect solar radiation back to space. With a reduction in emission of particulate matter, including aerosols, the indirect positive effect of aerosols on clouds would be reduced, potentially further amplifying the Greenhouse Effect.

The Cloud Effect

As global temperature rises, the ability of the air to hold moisture increases, facilitating cloud formation. As stated above, clouds can efficiently reflect solar radiation back to space. If an increase in cloud cover occurs at low or middle altitudes, resulting in clouds with greater liquid water content, such as stratus or cumulus clouds, more radiation would be reflected back to space than under current conditions. This would result in a negative feedback mechanism, in which the increase in cloud cover resulting from global climate change acts to balance the amount of further warming. If clouds form at higher altitudes in the form of cirrus clouds, however, these clouds allow more solar radiation to pass through than they reflect and ultimately act as a GHG themselves. This results in a positive feedback mechanism, in which the side effect of global climate change (an increase in cloud cover) acts to intensify the warming process. Because of the conflicting feedback mechanisms to which increasing cloud cover can contribute, this cloud effect is an area of relatively high uncertainty for scientists when projecting future global climate change conditions.

Other Feedback Mechanisms

As global temperature continues to rise, CH_4 gas trapped in permafrost is expected to be released into the atmosphere. As identified above in the description of CO_2 equivalents, CH_4 is approximately 21 times as efficient a GHG as CO_2; therefore, this release of CH_4 would accelerate and intensify global climate change if current trends continue. Additionally, as the surface area of polar and sea ice continues to diminish, Earth's albedo, or reflectivity, also is anticipated to decrease. More incoming solar radiation likely will be absorbed by the earth rather than be reflected back into space, further intensifying the Greenhouse Effect and associated global climate change. These and other both positive and negative feedback mechanisms are still being studied by the scientific community to better understand their potential effects on global climate change. It is not known at this time how much of an increase in global average temperature may result from the interaction of all the pertinent variables. Although the amount and rate of increase in global average temperature are uncertain, there is no longer much debate within the scientific community that global climate change is occurring and that human-caused GHG emissions are contributing to this phenomenon.

ATTRIBUTING CLIMATE CHANGE—GREENHOUSE GAS EMISSION SOURCES

Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors (California Energy Commission [CEC] 2006x). In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation (CEC 2006x). Emissions of CO_2 are byproducts of fossil fuel combustion. CH_4, a highly potent GHG, results from off-gassing (the release of chemicals from nonmetallic substances under ambient or greater pressure conditions) is largely associated with agricultural practices and landfills. CO_2 sinks, or reservoirs, include vegetation and the ocean, which absorb CO_2 through sequestration and dissolution, respectively, two of the most common processes of CO_2 sequestration.

California is the 12th to 16th largest emitter of CO_2 in the world (CEC 2006x). California produced 499 million gross metric tons of CO_2 equivalent (CO_2e) in 2004 (ARB 2007x). CO_2e is a measurement used to account for the fact that different GHGs have different potential to retain infrared radiation in the atmosphere and contribute to the Greenhouse Effect. This potential, known as the global warming potential (GWP) of a GHG, is dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. For example, as described in Appendix C, "Calculation References," of the General Reporting Protocol of the California Climate Action Registry (CCAR 2007), 1 ton of CH_4 has the same contribution to the Greenhouse Effect as approximately 23 tons of CO_2. Therefore, CH_4 is a much more potent GHG than CO_2. Expressing emissions in CO_2e takes the contributions of all GHG emissions to the Greenhouse Effect and converts them to a single unit equivalent to the effect that would occur if only CO_2 were being emitted.

Combustion of fossil fuel in the transportation sector was the single largest source of California's GHG emissions in 2004, accounting for 40.7% of total GHG emissions in the state (CEC 2006x). This sector was followed by the electric power sector (including both in-state and out-of-state sources) (22.2%) and the industrial sector (20.5%) (CEC 2006x).

4.2.2 REGULATORY SETTING

Air quality within Merced County is regulated by EPA, ARB, and SJVAPCD. Each of these agencies develops rules, regulations, policies, and/or goals to comply with applicable legislation. Although EPA regulations may not be superseded, both state and local regulations may be more stringent.

FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

U.S. Environmental Protection Agency

At the federal level, EPA has been charged with implementing national air quality programs. EPA's air quality mandates are drawn primarily from the federal Clean Air Act (CAA), which was enacted in 1970. The most recent major amendments made by Congress were in 1990.

The CAA required EPA to establish national ambient air quality standards (NAAQS). As shown in Table 4.2-2, EPA has established primary and secondary NAAQS for the following criteria air pollutants: ozone, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead. The primary standards protect the public health and the secondary standards protect public welfare. The CAA also required each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP). The federal Clean Air Act Amendments of 1990 (CAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is periodically modified to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. EPA has responsibility to review all state SIPs to determine conformation to the mandates of the CAA, and the amendments thereof, and determine if implementation will achieve air quality goals. If EPA determines a SIP to be inadequate, a Federal Implementation Plan may be prepared for the nonattainment area that imposes additional control measures. Failure to submit an approvable SIP or to implement the plan within the mandated timeframe may result in sanctions being applied to transportation funding and stationary air pollution sources in the air basin.

In April 2007 the Supreme Court of the United States ruled that CO_2 is an air pollutant as defined under the CAA, and that EPA has the authority to regulate emissions of GHGs. However, there are no federal regulations or policies regarding GHG emissions applicable to the proposed project.

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

California Air Resources Board

ARB is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA). The CCAA, which was adopted in 1988, required ARB to establish California ambient air quality standards (CAAQS) (Table 4.2-3). ARB has established CAAQS for sulfates, hydrogen sulfide, vinyl chloride, visibility-reducing particulate matter, and the above mentioned criteria air pollutants. In most cases the CAAQS are more stringent than the NAAQS. Differences in the standards are generally explained by the health effects studies considered during the standard setting process and the interpretation of the studies. In addition, the CAAQS incorporate a margin of safety to protect sensitive individuals.

The CCAA requires that all local air districts in the state endeavor to achieve and maintain the CAAQS by the earliest practical date. The act specifies that local air districts should focus particular attention on reducing the

emissions from transportation and areawide emission sources, and provides districts with the authority to regulate indirect sources.

Other ARB responsibilities include, but are not limited to, overseeing local air district compliance with California and federal laws, approving local air quality plans, submitting SIPs to EPA, monitoring air quality, determining and updating area designations and maps, and setting emissions standards for new mobile sources, consumer products, small utility engines, off-road vehicles, and fuels. There are 15 nonattainment areas for the national ozone standard and two nonattainment areas for the $PM_{2.5}$ standard. The Ozone SIP and $PM_{2.5}$ SIP must be adopted and sent to EPA by June 2007 and April 2008, respectively. The SIP must show how each area will attain the federal standards. To do this, the SIP will identify the amount of pollution emissions that must be reduced in each area to meet the standard and the emission controls needed to reduce the necessary emissions.

ARB and local air pollution control districts are currently developing plans for meeting new national air quality standards for ozone and $PM_{2.5}$. The Draft Statewide Air Quality Plan was released in April 2007 (ARB 2007x).

Airborne Toxic Control Measures (ATCM) to Limit Diesel-Fueled Commercial Motor Vehicle Idling

As part of its diesel risk reduction plan, ARB has developed an air toxic control measure that limits stationary idling by diesel-fueled commercial trucks to 5 minutes (13 CCR Chapter 10 Section 2485).

Assembly Bill 1493

In 2002, then-Governor Gray Davis signed Assembly Bill (AB) 1493. AB 1493 requires that ARB develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty trucks and other vehicles determined by ARB to be vehicles whose primary use is noncommercial personal transportation in the state."

To meet the requirements of AB 1493, in 2004 ARB approved amendments to the California Code of Regulations (CCR) adding GHG emissions standards to California's existing standards for motor vehicle emissions. Amendments to CCR Title 13, Sections 1900 and 1961 (13 CCR 1900, 1961), and adoption of Section 1961.1 (13 CCR 1961.1) require automobile manufacturers to meet fleet-average GHG emissions limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty passenger vehicle weight classes (i.e., any medium-duty vehicle with a gross vehicle weight rating less than 10,000 pounds that is designed primarily for the transportation of persons), beginning with the 2009 model year. Emissions limits are reduced further in each model year through 2016. Emissions requirements adopted as part of 13 CCR 1961.1 are shown in Table 4.2-4. For passenger cars and light-duty trucks with a loaded vehicle weight (LVW) of 3,750 pounds or less, the GHG emission limits for the 2016 model year are approximately 37% lower than the limits for the first year of the regulations, the 2009 model year. For light-duty trucks with LVW of 3,751 pounds to gross vehicle weight (GVW) of 8,500 pounds, as well as medium-duty passenger vehicles, GHG emissions are reduced approximately 24% between 2009 and 2016.

Table 4.2-4
Fleet-Average Greenhouse Gas Exhaust Emission Limits Included in CCR 13 1961.1

Vehicle Model Year	Fleet-Average Greenhouse Gas Emissions (carbon dioxide equivalents in grams per mile)	
	Light-Duty Trucks 0–3,750 Pounds LVW and Passenger Cars	Light-Duty Trucks 3,751 Pounds LVW to 8,500 Pounds GVW and Medium-Duty Passenger Vehicles*
2009	323	439
2010	301	420
2011	267	390

Table 4.2-4
Fleet-Average Greenhouse Gas Exhaust Emission Limits Included in CCR 13 1961.1

Vehicle Model Year	Fleet-Average Greenhouse Gas Emissions (carbon dioxide equivalents in grams per mile)	
	Light-Duty Trucks 0–3,750 Pounds LVW and Passenger Cars	Light-Duty Trucks 3,751 Pounds LVW to 8,500 Pounds GVW and Medium-Duty Passenger Vehicles*
2012	233	361
2013	227	355
2014	222	350
2015	213	341
2016	205	332

Notes: GVW = gross vehicle weight, LVW = loaded vehicle weight.
* Specific characteristics of passenger cars, light-duty trucks, and medium-duty passenger vehicles are provided in Title 13, Section 1900 of the California Code of Regulations as amended to comply with Assembly Bill 1493.
Source: California Code of Regulations, Title 13, Section 1961.1

In December 2004, a group of car dealerships, automobile manufacturers, and trade groups representing automobile manufacturers filed suit against ARB to prevent enforcement of 13 CCR Sections 1900 and 1961 as amended by AB 1493 and 13 CCR 1961.1 (*Central Valley Chrysler-Jeep et al. v. Catherine E. Witherspoon, in Her Official Capacity as Executive Director of the California Air Resources Board, et al.*). The suit, still in process, in the U.S. District Court for the Eastern District of California, contends that California's implementation of regulations that, in effect, regulate vehicle fuel economy violates various federal laws, regulations, and policies. To date, the suit has not been settled, and the judge has issued an injunction stating that ARB cannot enforce the regulations in question before receiving appropriate authorization from EPA. In January 2007, the judge hearing the case accepted a request from the State Attorney General's office that the trial be postponed until a decision is reached by the U.S. Supreme Court on a separate case addressing GHGs. In the Supreme Court case, *Massachusetts, et al., v. Environmental Protection Agency, et al.*, the primary issue in question was whether the CAA provides authority for EPA to regulate CO_2 emissions. EPA contended that the CAA does not authorize regulation of CO_2 emissions, whereas Massachusetts and 10 other states, including California, sued EPA to begin regulating CO_2. The U.S. Supreme Court rule on April 2, 2007 that GHGs are "air pollutants" as defined under the CAA, and EPA is granted authority to regulate CO_2 (*Massachusetts v. U.S. Environmental Protection Agency* [2007] 549 U.S. 05-1120).

Executive Order S-3-05

Executive Order S-3-05, which was signed by Governor Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra's snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the Executive Order established total greenhouse gas emission targets. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80% below the 1990 level by 2050.

The Executive Order directed the Secretary of the California Environmental Protection Agency (CalEPA) to coordinate a multi-agency effort to reduce greenhouse gas emissions to the target levels. The Secretary will also submit biannual reports to the governor and state legislature describing: (1) progress made toward reaching the emission targets; (2) impacts of global warming on California's resources; and (3) mitigation and adaptation plans to combat these impacts. To comply with the Executive Order, the Secretary of the CalEPA created the California Climate Action Team (CCAT) made up of members from various state agencies and commission. CAT released its first report in March 2006. The report proposed to achieve the targets by building on voluntary actions of

California businesses, local government and community actions, as well as through state incentive and regulatory programs.

Assembly Bill 32, the California Climate Solutions Act of 2006

In September 2006, Governor Arnold Schwarzenegger signed AB 32, the California Climate Solutions Act of 2006. AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. This reduction will be accomplished through an enforceable statewide cap on GHG emissions that will be phased in starting in 2012. To effectively implement the cap, AB 32 directs ARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then ARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

AB 32 requires that ARB adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrives at the cap; institute a schedule to meet the emissions cap; and develop tracking, reporting, and enforcement mechanisms to ensure that the state achieves the reductions in GHG emissions necessary to meet the cap. AB 32 also includes guidance to institute emissions reductions in an economically efficient manner and conditions to ensure that businesses and consumers are not unfairly affected by the reductions.

AB 32 does not explicitly apply to emissions from land development, though emissions associated with land development projects are closely connected to the utilities, transportation, and commercial end-use sectors. Further, because AB 32 imposes a statewide emissions cap, land development-related emissions will ultimately factor in to considerations of GHG emissions in the state.

Senate Bill 1368

SB 1368 is the companion bill of AB 32 and was signed by Governor Schwarzenegger in September 2006. SB 1368 requires the California Public Utilities Commission (PUC) to establish a greenhouse gas emission performance standard for baseload generation from investor owned utilities by February 1, 2007. The California Energy Commission (CEC) must establish a similar standard for local publicly owned utilities by June 30, 2007. These standards cannot exceed the greenhouse gas emission rate from a baseload combined-cycle natural gas fired plant. The legislation further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the PUC and CEC.

Senate Bills 1771 and 527 and the California Climate Action Registry

The California Climate Action Registry (CCAR) was established in 2001 by Senate Bills 1771 and 527 as a nonprofit voluntary registry for GHG emissions. The purpose of CCAR is to help companies and organizations with operations in the state to establish GHG emissions baselines against which any future GHG emissions reduction requirements may be applied. CCAR has developed a general protocol and additional industry-specific protocols that provide guidance on how to inventory GHG emissions for participation in the registry.

Senate Bill 97

Senate Bill (SB) 97, signed August 2007, acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA. This bill directs the State Office of Planning and Research (OPR) to prepare, develop, and transmit to the Resources Agency guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, as required by CEQA by July 1, 2009. The Resources Agency is required to certify or adopt those guidelines by January 1, 2010. This bill also removes inadequate CEQA analysis of effects of GHG emissions from projects (retroactive and future) funded by the Highway Safety, Traffic Reduction, Air Quality

and Port Security Bond Act of 2006, or the Disaster Preparedness and Flood Protection Bond Act of 2006 (Proposition 1B or 1E) as a legitimate cause of action. This provision will be repealed on January 1, 2010, wherein inadequate CEQA analysis for those projects could then become a legitimate cause of action. This bill would only protect a handful of public agencies from CEQA challenges on certain types of projects for a few years time.

LOCAL PLANS, POLICIES, REGULATIONS, AND ORDINANCES

San Joaquin Valley Air Pollution Control District

The SJVAPCD seeks to improve 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 and programs for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations, and issuance of permits for stationary sources. The SJVAPCD also inspects stationary sources, responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements other programs and regulations required by the CAA, CAAA, and the CCAA.

In January 2002, the SJVAPCD released a revision to the previously adopted guidelines document. This revised Guide for Assessing and Mitigation Air Quality Impact (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 guide 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; and
- information for use in air quality assessments that will be updated more frequently such as air quality data, regulatory setting, climate, and topography.

Air Quality Plans

The SJVAPCD prepares and submits Air Quality Attainment Plans in compliance with the requirements set forth in the CCAA. The CCAA also requires a triennial assessment of the extent of air quality improvements and emission reductions achieved through the use of control measures. As part of the assessment, the attainment plans must be reviewed and, if necessary, revised to correct for deficiencies in progress and to incorporate new data or projections. As a nonattainment area, the region is also required to submit rate-of-progress milestone evaluations in accordance with the CAAA. These milestone reports include compliance demonstrations that the requirements have been met for the nonattainment area. The air quality attainment plans and reports present comprehensive strategies to reduce ROG, NO_X, and PM_{10} emissions from stationary, area, mobile, and indirect sources. Such strategies include the adoption of rules and regulations; enhancement of CEQA participation; implementation of a new and modified indirect source review program (Rule 9510); adoption of local air quality plans; and stationary-, mobile-, and indirect-source control measures. In the formulation of its attainment plans, SJVAPCD accounts for all future projected growth and development in the SJVAB as provided by local governments, including the City of Merced, through the Merced County Association of Governments (MCAG). (More details about MCAG are provided under its own heading later in this section.) Table 4.2-5 summaries SJVAPCD's most current Air Quality Attainment Plans.

Table 4.2-5
Summary of San Joaquin Valley Air Pollution Control District Air Quality Plans

Pollutant	Plan Title	Date	Status
Ozone	Extreme Ozone Attainment Demonstration Plan for the Revoked Federal 1-Hour Ozone Standard	October 2004, Amended October 2005, Clarifications adopted August 2008	On April 30, 2007 the Governing Board of the SJVAPCD voted to request EPA to reclassify the SJVAB as extreme nonattainment for the federal 8-hour ozone standards. On June 14, 2007, ARB approved this request. On October 16, 2008 EPA proposed to approve the plan [73 FR 613781].
	8-hour Ozone Reasonably Available Control Technology – State Implementation Plan (RACT SIP) Analysis	April 2006	Adopted by SJVAPCD in August 2006.
	8-hour Ozone Attainment Demonstration Plan for the San Joaquin Valley	April 2007	Adopted by SJVAPCD in April 2007. This request must be forwarded to EPA by ARB and would become effective upon EPA final rulemaking after a notice and comment process; it is not yet in effect.
Carbon Monoxide (CO)	2004 Revision to the California State Implementation Plan for Carbon Monoxide Updated Maintenance Plan For Ten Federal Planning Areas	July 2004	Adopted by ARB July 2004.
Respirable and Fine Particulate Matter (PM_{10} and $PM_{2.5}$)	2007 PM_{10} Maintenance Plan and Request for Redesignation.	September 2007	Adopted by SJVAPCD in February 2006. EPA issued a Final Rule determining that the SJVAB had attained the NAAQS for PM10 [71 FR 63642] in October 2006.
	2008 $PM_{2.5}$ Plan	April 2008	The SJVAB is designated nonattainment for the 1997 $PM_{2.5}$ federal standards. EPA designations for the 2006 PM 2.5 standards will be finalized in December 2009. SJVAPCD has determined, as of the 2004-06 $PM_{2.5}$ data, that the SJVAB has attained the 1997 24-Hour $PM_{2.5}$ standard.
	Natural Events Action Plan for High Wind Events in the San Joaquin Valley	February 2006	Adopted by SJVAPCD in February 2006; Submitted to ARB

Source: SJVAPCD 2005, 2006a, 2007x, 2006x 2007x

Rules and Regulations

As mentioned above, the SJVAPCD adopts rules and regulations. All projects are subject to SJVAPCD rules and regulations in effect at the time of construction. Specific rules applicable to the construction and operation of the proposed project may include, but are not limited to:

- Rule 2201 New and Modified Stationary Source Review
- Rule 2280 Portable Equipment Registration
- Rule 3135 Dust control Plan Fee
- Rule 4002 National Emission Standards for Hazardous Air Pollutants
- Rule 4101 Visible Emissions

- Rule 4102 Nuisance
- Rule 4103 Open Burning
- Rule 4601 Architectural Coatings
- Rule 4641 Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations
- Rule 4901 Wood Burning Fireplaces and Wood Burning Heaters
- Regulation VIII Fugitive PM_{10} Prohibitions includes the following rules:
  - *Rule 8021*: Construction, demolition, excavation, and extraction; and other earthmoving activities;
  - *Rule 8031*: Handling and storage of bulk materials;
  - *Rule 8041*: Trackout/Carryout of dirt and other materials onto paved public roads;
  - *Rule 8051*: Open Areas;
  - *Rule 8061*: Construction and use of paved and unpaved roads; and
  - *Rule 8071*: Use of unpaved vehicle and/or equipment traffic areas; and
  - *Rule 8081*: Agricultural Sources.

- Rule 9510 Indirect Source Review. Indirect Source Review (ISR) applies to development and transportation or transit projects that have not yet gained discretionary approval. A discretionary permit is a permit from a public agency, such as a city or county that requires some amount of deliberation by that agency, including the potential to require modifications or conditions on the project. The purpose of the ISR program is to reduce emissions of NO_X and PM_{10} from new development projects. In general, new development contributes to the air-pollution problem in the basin by increasing the number of vehicles and vehicle miles traveled and by associated construction activity. When a development project cannot reduce its emissions of NO_X and PM_{10} to the level required by the rule, then the difference must be mitigated through the payment of a fee. The monies collected from each project fee is used by SJVAPCD to reduce emissions in the SJVAB on behalf of the respective project, with the goal of offsetting the emissions increase from the project by decreasing emissions elsewhere in the SJVAB. More specifically, the fees received are used in SJVAPCDs existing Emission Reduction Incentive Program to fund emission reduction projects. With regard to the development of light industrial facilities, this rule applies to any development project that would need a final discretionary approval and upon full buildout would include a minimum of 25,000 square feet of light industrial space. Thus, the proposed project would be subject to requirements set forth in the ISR rule.

City of Merced

Merced Vision 2015 General Plan

Air quality is addressed in the Sustainable Development element of the *Merced Vision 2015 General Plan* (City of Merced 1997). The following goals are included in the Sustainable Development Element as Goal Area SD-1:

- clean air with minimal toxic substances and odor,
- clean air with minimal particulate content,
- effective and efficient transportation infrastructure, and
- coordinated and cooperative inter-governmental air quality programs.

The policies and implementing actions of for the above-listed goals are presented below:

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

  - Implementing Action 1.1.a. Develop uniform standards for mitigating air quality impacts resulting from development.

  - Implementing Action 1.1.b. Ensure that significant air quality impacts identified during CEQA review are consistently and fairly mitigated.

- Implementing Action 1.1.c. All air quality mitigation measures should be feasible, implementable, and cost effective.

- Implementing Action 1.1.d. Work with the [SJVAPCD] to identify regional cumulative transportation and air quality impacts.

- Implementing Action 1.1.e. Reduce the air quality impacts of development projects that may be insignificant by themselves, but cumulatively are significant.

- Implementing Action 1.1.f. Encourage innovative measures to reduce air quality impacts.

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

- Implementing Action 1.2.a. Work with neighboring jurisdictions and affected agencies to address cross-jurisdictional and regional transportation and air quality issues.

- Implementing Action 1.2.b. Consult with [SJVAPCD] during CEQA review for discretionary projects.

- Implementing Action 1.2.c. Coordinate with other jurisdictions and other regional agencies in the San Joaquin Valley to establish consistent and uniform implementation measures (trip reduction ordinances, indirect source programs, etc.).

- Implementing Action 1.2.d. Support cost-effective multi-use modeling and geographic information system (GIS) technology.

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

- Implementing Action 1.3.a. The City of Merced will consider air quality when planning the land uses and transportation systems to accommodate the expected growth in this community.

- Implementing Action 1.3.b. Transportation improvement should be consistent with the air quality goals and policies of the General Plan.

- Implementing Action 1.3.c. The City of Merced will consult with transit providers to determine project impacts on long range transit plans and ensure that impacts are mitigated.

- Implementing Action 1.3.d. Encourage the construction of low income housing developments that use transit-oriented and pedestrian-oriented design principles.

- Implementing Action 1.3.e. The City of Merced will work with Caltrans and the Merced County Association of Governments (MCAG) and the Regional Transportation Planning Agency to minimize the air quality, and mobility impacts of large scale transportation projects on existing neighborhoods.

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

- Implementing Action 1.4.a. Work to improve the public's understanding of the land use, transportation, and air quality link.

- Implementing Action 1.4.b. Support [SJVAPCD] efforts to encourage formation of local groups that provide air quality education programs.

- Policy SD-1.5. Provide public facilities and operations which can serve as a model for the private sector in implementation of air quality programs.
    - Implementing Action 1.5.a. Study implementing innovative employer-based trip reduction programs for their employees.
    - Implementing Action 1.5.b. Fleet vehicle operators should evaluate alternatives which include replacing or converting conventional fuel vehicles with clean fuel vehicles.
    - Implementing Action 1.5.c. Support the use of teleconferencing in lieu of employee travel to conferences and meetings when feasible.
    - Implementing Action 1.5.d. Make use of telecommuting programs as part of their trip reduction strategies.
    - Implementing Action 1.5.e. Encourage the development of state of the art communication infrastructure linked to the rest of the world.
- Policy SD-1.6. Reduce emissions of PM_{10} and other particulates with local control potential.
    - Implementing Action 1.6.a. Work with the [SJVAPCD] to reduce, to the maximum extent feasible, particulate emissions from construction, grading, excavation, and demolition.
    - Implementing Action 1.6.b. Reduce PM10 emissions from City maintained roads to the maximum extent feasible.
- Policy SD-3.1: Promote the use of solar energy technology.
    - Implementing Action 3.1.a: Encourage the use of solar energy in design and management of all new construction in the City.
    - Implementing Action 3.1.c: Encourage developers and builders to properly design all structures on each building lot in the City to take fullest advantage of solar use in heating and cooling.
    - Implementing Action 3.1.d: Encourage developers and builders to maximize "passive" solar design, such as large south-facing windows for winter heat gains and overhangs for shading for summer heat protection.

In addition, Implementation Action 3.1.h of the Land Use element states that the city shall consider air quality and mobility when reviewing any proposed change to the land use pattern of this community.

- Policy SD-3.2: Encourage the use of energy conservation features and low emission equipment for all new residential and commercial development.
    - Implementing Action 3.4.c: Encourage new residential, commercial, and industrial development to reduce air quality impacts from area sources and from energy consumption.
- Policy 0S-1.4. Maintain and expand the City's urban forest and reduce the heat island effects of urban development.
- Implementing Action 1.4.b: Continue to require new development to plant street trees approximately 40 feet apart, at a maximum, along City streets.

Merced County Association of Governments

The Merced County Association of Governments (MCAG) was formed through a Joint Powers Agreement (JPA) signed by member jurisdictions on November 28, 1967, and the Governing Board is composed of all five members of the Merced County Board of Supervisors and one elected official from each of the six incorporated cities located within the political boundary of Merced County.

The Overall Budget and Work Program is a product of a cooperative effort of the MCAG Technical Planning Committee for Regional Transportation Planning (TPC), composed of local governmental technical staff members; the Citizens' Advisory Committee for Regional Transportation Planning (CAC), composed of citizens appointed by the MCAG Governing Board, the MCAG Technical Review Board (TRB), composed of the chief administrative officers of all local governments within Merced County; the MCAG Executive Committee; and the MCAG Board.

The MCAG participates in air quality planning for which the purpose of the program is to inform and advise MCAG and member agencies on air quality issues and policies; to ensure that MCAG's transportation plans, programs, and projects conform to the most recent air quality requirements; and to coordinate effectively with other government agencies on these matters.

Air quality conformity is the process wherein plans, programs, and projects are shown to meet the requirements of the CAA and CAAA, and the applicable SIP. Specific procedures for fulfilling the requirements of the CAAA are given in the Final Conformity Rule published by EPA in 1993 and updated in 2004. MCAG is responsible for fulfilling these requirements. Similar work is performed by the seven other Transportation Planning Agencies (TPAs) in the SJVAB. All SJVAB TPAs work closely with each other and with the SJAPCD on air quality issues, conformity determinations, and the development and implementation of Transportation Control Measures, with the ultimate goal of improving the air quality in the SJVAB. A Memorandum of Understanding exists between the Air District and the eight valley TPAs, for the purpose of ensuring coordinated and consistent valley-wide air quality planning.

MCAG recently prepared the final draft of the PM2.5 Air Quality Conformity Analysis for the Federally Approved 2004 Federal Transportation Improvement Program (FTIP) for Merced County (Merced County Association of Governments 2006). MCAG is also involved with the following activities, plans and programs:

- Air Quality Conformity Determinations for the Regional Transportation Plan (RTP) and FTIP;
- monitor State and Federal air quality regulations and plans, and advise the MCAG Governing Board and member jurisdictions;
- coordinate with the SJVAPCD and TPAs on air quality issues;
- ensure timely implementation of all required transportation control measures;
- collaborate with ARB and SJVAPCD on emission inventory development;
- provide vehicle miles travel (VMT) data to ARB for use in emission budgets; and
- prepare air quality conformity analyses for the RTP and FTIP amendments.

TOXIC AIR CONTAMINANTS

Air quality regulations also focus on TACs, or in federal parlance hazardous air pollutants (HAPs). In general, for those TACs that may cause cancer, there is no concentration that does not present some risk. In other words, there is no threshold level below which adverse health impacts may not be expected to occur. This contrasts with the

criteria air pollutants for which acceptable levels of exposure can be determined and for which the ambient standards have been established (Table 4.2-3). Instead, EPA and ARB regulate HAPs and TACs, respectively, through statutes and regulations that generally require the use of the maximum or best available control technology for toxics (MACT and BACT) to limit emissions. These in conjunction with additional rules set forth by the SJVAPCD establish the regulatory framework for TACs.

Federal Hazardous Air Pollutant Programs

EPA has programs for identifying and regulating HAPs. Title III of the CAAA directed EPA to promulgate national emissions standards for HAPs (NESHAP). The NESHAP may differ for major sources than for area sources of HAPs. Major sources are defined as stationary sources with potential to emit more than 10 tons per year (TPY) of any HAP or more than 25 TPY of any combination of HAPs; all other sources are considered area sources. The emissions standards are to be promulgated in two phases. In the first phase (1992–2000), EPA developed technology-based emission standards designed to produce the maximum emission reduction achievable. These standards are generally referred to as requiring MACT. For area sources, the standards may be different, based on generally available control technology. In the second phase (2001–2008), EPA is required to promulgate health risk–based emissions standards where deemed necessary to address risks remaining after implementation of the technology-based NESHAP standards.

The CAAA also required EPA to issue vehicle or fuel standards containing reasonable requirements that control toxic emissions, at a minimum to benzene and formaldehyde. Performance criteria were established to limit mobile-source emissions of toxics, including benzene, formaldehyde, and 1,3-butadiene. In addition, Section 219 required the use of reformulated gasoline in selected areas with the most severe ozone nonattainment conditions to further reduce mobile-source emissions.

State and Local Toxic Air Contaminant Programs

TACs in California are primarily regulated through the Tanner Air Toxics Act (AB 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). AB 1807 sets forth a formal procedure for ARB to designate substances as TACs. This includes research, public participation, and scientific peer review before ARB can designate a substance as a TAC. To date, ARB has identified over 21 TACs, and adopted EPA's list of HAPs as TACs. Most recently, diesel PM was added to the ARB list of TACs.

Once a TAC is identified, ARB then adopts an Airborne Toxics Control Measure for sources that emit that particular TAC. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate BACT to minimize emissions (e.g., the Airborne Toxic Control Measure limits truck idling to 5 minutes [13 CCR Chapter 10 Section 2485]).

The Hot Spots Act requires that existing facilities that emit toxic substances above a specified level prepare a toxic-emission inventory, prepare a risk assessment if emissions are significant, notify the public of significant risk levels, and prepare and implement risk reduction measures.

ARB has adopted diesel exhaust control measures and more stringent emission standards for various on-road mobile sources of emissions, including transit buses, and off-road diesel equipment (e.g., tractors, generators). In February 2000, ARB adopted a new public transit bus fleet rule and emission standards for new urban buses. These new rules and standards provide for 1) more stringent emission standards for some new urban bus engines beginning with 2002 model year engines; 2) zero-emission bus demonstration and purchase requirements applicable to transit agencies; and 3) reporting requirements with which transit agencies must demonstrate compliance with the urban transit bus fleet rule. Upcoming milestones include the low sulfur diesel fuel requirement, and tighter emission standards for heavy-duty diesel trucks (2007) and off-road diesel equipment (2011) nationwide. Over time, the replacement of older vehicles will result in a vehicle fleet that produces substantially less TACs than under current conditions. Mobile-source emissions of TACs (e.g., benzene, 1-3-

butadiene, diesel PM) have been reduced significantly over the last decade, and will be reduced further in California through a progression of regulatory measures [e.g., Low Emission Vehicle (LEV)/Clean Fuels and Phase II reformulated gasoline regulations) and control technologies. With implementation of ARB's Risk Reduction Plan, it is expected that diesel PM concentrations will be reduced by 75% in 2010 and 85% in 2020 from the estimated year 2000 level. Adopted regulations are also expected to continue to reduce formaldehyde emissions from cars and light-duty trucks. As emissions are reduced, it is expected that risks associated with exposure to the emissions will also be reduced.

ARB published the Air Quality and Land Use Handbook: A Community Health Perspective, which provides guidance concerning land use compatibility with TAC sources (ARB 2005). While not a law or adopted policy, the Handbook offers advisory recommendations for the siting of sensitive receptors near uses associated with TACs such as freeways and high-traffic roads, commercial distribution centers, rail yards, ports, refineries dry cleaners, gasoline stations, and industrial facilities to help keep children and other sensitive populations out of harm's way.

At the local level, air pollution control or management districts may adopt and enforce ARB control measures. Under SJVAPCD regulations II and VII, all sources that possess the potential to emit TACs are required to obtain permits from the district. Permits may be granted to these operations if they are constructed and operated in accordance with applicable regulations, including new source review standards and air toxics control measures. The SJVAPCD limits emissions and public exposure to TACs through a number of programs. The SJVAPCD prioritizes TAC-emitting stationary sources based on the quantity and toxicity of the TAC emissions and the proximity of the facilities to sensitive receptors.

Sources that require a permit are analyzed by the SJVAPCD (e.g., health risk assessment) based on their potential to emit toxics. If it is determined that the project would emit toxics in excess of SJVAPCD's threshold of significance for TACs, as identified below, sources have to implement the best available control technology for TACs (T-BACT) to reduce emissions. If a source cannot reduce the risk below the threshold of significance even after T-BACT has been implemented, the SJVAPCD will deny the permit required by the source. This helps to prevent new problems and reduces emissions from existing older sources by requiring them to apply new technology when retrofitting with respect to TACs. It is important to note that SJVAPCD's air quality permitting process applies to stationary sources; and properties, which are exposed to elevated levels of nonstationary type sources of TACs, and the nonstationary type sources themselves (e.g., on-road vehicles) are not subject to air quality permits. Further, because of feasibility and practicality reasons, mobile sources (cars, trucks, etc.) are not required to implement T-BACT, even if they do have the potential to expose adjacent properties to elevated levels of TACs. Rather, emissions controls on such sources (e.g., vehicles) are subject to regulations implemented on the state and federal level.

ODORS

The SJVAPCD has determined some common types of facilities that have been known to produce odors, including wastewater treatment facilities, chemical manufacturing plants, painting/coating operations, feed lots/dairies, composting facilities, landfills, and transfer stations. Because offensive odors rarely cause any physical harm and no requirements for their control are included in state or federal air quality regulations, the SJVAPCD has no quantitative rules or standards related to odor emissions other than its nuisance rule. Any actions related to odors are based on citizen complaints to local governments and the SJVAPCD. According to the SJVAPCD, significant odor problems occur when there is more than one confirmed complaint per year averaged over a 3-year period or when there are three unconfirmed complaints per year averaged over a 3-year period (SJVAPCD 2002).

Two situations increase the potential for odor problems. The first occurs when a new odor source is located near existing sensitive receptors. The second occurs when new sensitive receptors are developed near existing sources of odor. In the first situation, the SJVAPCD recommends operational changes, add-on controls, process changes,

or buffer zones where feasible to address odor complaints. In the second situation, the potential conflict is considered significant if the project site is at least as close as any other site that has already experienced significant odor problems related to the odor source. For projects locating near a source of odors where there is no nearby development that may have filed complaints, and for odor sources locating near existing sensitive receptors, the SJVAPCD requires the determination of potential conflict to be based on the distance and frequency at which odor complaints from the public have occurred in the vicinity of a similar facility (SJVAPCD 2002).

4.2.3 ENVIRONMENTAL IMPACTS

METHOD OF ANALYSIS

Emissions of short-term construction-related and long-term operation-related (i.e., regional and local) criteria air pollutants and precursors, odors, and TACs were assessed in accordance with SJVAPCD-recommended methodologies (SJVAPCD 2002, 2006x, 2007x, 2007x, 2007x, 2007x).

Project-generated, construction-related emissions of criteria air pollutants (e.g., PM_{10}) and precursors (ROG and NO_X) were assessed in accordance with SJVAPCD-recommended methods. Where quantification was required, emissions were modeled using the URBEMIS 2007 Version 9.2.2 computer model (ARB 2007x). Modeling was based on SJVAPCD-recommended parameters for composition of the construction equipment fleet (SJVAPCD 2007x, 2007x). Modeled project-generated, construction-related emissions were compared with applicable SJVAPCD thresholds for determination of significance.

Project-generated, operation-related (i.e., regional) emissions of criteria air pollutants and precursors (e.g. mobile- and area-sources) were also quantified using the URBEMIS 2007 Version 9.2.2 computer model (ARB 2007x). Modeling was based on project-specific data (e.g., size and type of proposed use) and vehicle trip information from the traffic analysis prepared for this project (DKS Associates 2008). No adjustments were made to account for increased fuel efficiency of Wal-Mart's truck fleet due to its participation in the U.S. EPA's SmartWay Transport Partnership. The Partnership is a voluntary program; therefore, although the current Wal-Mart fleet would have better than average fuel efficiency, nothing mandates them to continue to stay in the program. Thus, this EIR uses a conservative, reasonably foreseeable scenario that considers that Wal-Mart could use a fleet that is more reflective of the average fleet. To the extent Wal-Mart continues to participate in the program, the analysis likely over-states actual emissions from Wal-Mart's truck fleet. Long-term stationary-source emissions were qualitatively assessed in accordance with SJVAPCD-recommended methodologies. Modeled project-generated, long-term operation-related emissions were compared with applicable SJVAPCD thresholds for determination of significance.

At this time, SJVAPCD has not adopted a methodology for analyzing short-term construction-related emissions of TACs and does not recommended the completion of health risk assessments (HRAs) for such emissions, with a few exceptions (e.g., where construction phase is the only phase of project) (Reed, pers. comm., 2007). Therefore, project-generated, construction-related emissions of TACs were assessed in a qualitative manner.

With respect to long-term operation-related exposure of sensitive receptors to emissions of TACs, a HRA was performed in accordance with *The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments* (OEHHA 2003) and SJVAPCD's *Guidance for Air Dispersion Modeling* (SJVAPCD 2007x). Refer to Appendix C for a copy of the HRA prepared for this project (ENSR 2007).

To date, SJVAPCD has not adopted a method for evaluating impacts associated with emissions of $PM_{2.5}$. However, because project-generated, construction- and operation-related emissions of $PM_{2.5}$, by definition, would be a subset of PM_{10} emissions, SJVAPCD-recommended methodologies and mitigation measures for PM_{10} would also be relevant to emissions of $PM_{2.5}$.

Project-generated emissions of GHGs would predominantly be in the form of CO_2. While emissions of other GHGs, such as methane, are important with respect to global climate change, the project is not expected to emit

significant quantities of GHGs other than CO_2. The reason for this conclusion is that most emissions from the project are associated with vehicular emissions and, though vehicles also emit small quantities of N_20 and CH_4, the primary GHG emitted during fuel combustion is CO_2, even considering the higher global warming potential of N_20 and CH_4 (21 and 310 times that of CO_2 , respectively [CCAR 2007]). Thus, project-generated emissions of CO_2 were used as a proxy for total emissions GHGs, unless otherwise noted.

With respect to the proposed project, the net increase in emissions of CO_2 would be primarily associated with an increase in truck and passenger vehicle activity, off-site and on-site, and consumption of electricity. Construction- and operation-related emissions of CO_2 were quantified using the URBEMIS 2007 Version 9.2.2 computer model (ARB 2007x). Modeling was based on project-specific data (e.g., size and type of proposed use) and vehicle trip information from the traffic analysis prepared for this project (DKS Associates 2008) and truck trip information from an existing Wal-Mart distribution centers in California (McAlexander, pers. comm., 2007). Indirect emissions of CO_2 associated with electricity consumption were estimated according to methodologies of the California Climate Action Registry General Reporting Protocol, Version 2.2 (CCAR 2007).

THRESHOLDS OF SIGNIFICANCE

Based on Appendix G of the State CEQA Guidelines and SJVAPCD, an air quality impact is considered significant if implementation of the proposed project would do any of the following:

- conflict with or obstruct implementation of the applicable air quality plan,
- violate any air quality standard or contribute substantially to an existing or projected air quality violation,
- result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable NAAQS or CAAQS (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 or people.

As stated in Appendix G, the significance of criteria established by the applicable air quality management or air pollution control district may be relied upon to make the above determinations. Thus, as contained in the GAMAQI, implementation of the proposed project would result in significant air quality impacts if:

- all control measures in compliance with the requirements of Regulation VIII-Fugitive Dust Prohibition are not incorporated into project design or implemented during project construction;
- construction-related emissions of ROG or NO_X exceed SJVAPCD-recommended mass emissions threshold of 10 TPY;
- long-term operation-related regional emissions of ROG or NO_X exceed SJVAPCD-recommended mass emissions threshold of 10 TPY;
- construction- or operation-related emissions (i.e., regional and local) of criteria air pollutants or precursor emissions violate or substantially contribute to a violation of the NAAQS and/or CAAQS (e.g., 8-hour CO standard of 9 ppm);
- exposure of sensitive receptors to a substantial incremental increase in emissions of TACs that exceed 10 in 1 million for the carcinogenic risk (i.e., the risk of contracting cancer) and/or a noncarcinogenic Hazard Index (HI) of 1 for the Maximally Exposed Individual (MEI), as recommended in SJVAPCD's *Guidance for Air Dispersion Modeling* (SJVAPCD 2007x); or

- project implementation would locate receptors near an existing odor source where one confirmed complaint per year averaged over a three year period, or three unconfirmed complaints per year averaged over a three year period has been experienced by existing receptors as close as the project to the odor source; or by existing receptors in the vicinity of a similar facility considering distance, frequency, and odor control, where there is currently no nearby development and for proposed odor sources near existing receptors.

In addition, the following thresholds of significance have been used to determine whether implementation of the proposed project would result in significant impacts with respect to global climate change. A global climate change impact is considered significant if implementation of the proposed project under consideration would do any of the following:

- conflict with or obstruct state or local policies or ordinances established for the purpose of reducing greenhouse gas emissions, or

- result in a considerable net increase in greenhouse gases.

With regard to emissions of GHGs, no air district in California, including the SJVAPCD, has identified a significance threshold for analyzing project-generated emissions or a methodology for analyzing air quality impacts related to global warming. Nonetheless, by adoption of AB 32, California has identified that global climate change is a serious environmental issue, and has identified GHG reduction goals.

To meet AB 32 goals, California as a whole will ultimately need to generate substantially less GHG than current levels. It is recognized, however, that for most projects there is no simple metric available to determine if a single project would substantially increase or decrease overall emission levels of GHGs.

While AB 32 focuses on stationary sources of emissions, the primary objective of AB 32 is to reduce California's contribution to global warming by reducing California's total annual production emissions. The impact that emissions of GHGs have on global climate change is not dependent on whether they were generated by stationary, mobile, or area sources; or whether they were generated in one region or another. Thus, the net change in total levels of GHGs generated by a project or activity is the best metric for determining whether the proposed project would contribute to global warming.

The effect of GHG emissions as they relate to global climate change is inherently a cumulative impact issue. While the emissions of one single project will not cause global climate change, GHG emissions from multiple projects throughout the world could result in a cumulative impact with respect to global climate change. In the case of the proposed project, if the size of the increase in emissions from the project is considered to be substantial, then the impact of the project would be cumulatively considerable. Please refer to Chapter 6, "Cumulative and Growth-Inducing Impacts," of this EIR for a description of GHG related and other cumulative impacts of the project.

IMPACT ANALYSIS

IMPACT 4.2-1 Generation of Short-Term Construction-Related Emissions of Criteria Air Pollutants and Precursors. *Project-generated, construction-related emissions of ROG and NO_X would exceed SJVAPCD's significance threshold of 10 TPY. In addition, with respect to construction-related emissions of PM_{10}, SJVAPCD-recommended control measures beyond compliance with Regulation VIII-Fugitive Dust Prohibition are not incorporated into the project design. Thus, project-generated, construction- related emissions of criteria air pollutants and precursors could violate or contribute substantially to an existing or projected air quality violation, and/or expose sensitive receptors to substantial pollutant concentrations, especially considering the nonattainment status of Merced County. As a result, this would be a* ***significant*** *impact.*

Construction-related emissions are described as "short term" or temporary in duration and have the potential to represent a significant impact with respect to air quality. Construction of the proposed project could begin as early as 2008 and would take 12 months for completion. Construction-related activities would result in project-generated emissions of criteria air pollutants (e.g., PM_{10}) and precursors (e.g., ROG and NO_X) from site preparation (e.g., excavation, grading, and clearing); off-road equipment, material delivery, and worker commute exhaust emissions; vehicle travel on unpaved roads, and other miscellaneous activities (e.g., asphalt paving and the application of architectural coatings).

Emissions of Ozone Precursors

Emissions of ozone precursors (e.g., ROG and NO_X) are primarily associated with off-road equipment exhaust. Worker commute trips and other construction-related activities (e.g., asphalt paving and the application of architectural coatings) also contribute to short-term increases in such emissions.

Project-generated, construction-related emissions of ROG and NO_X were modeled using the ARB-approved URBEMIS 2007 Version 9.2.2 computer program (ARB 2007x). URBEMIS is designed to model construction emissions for land use development projects based on building size and type and allows for the input of project-specific information. Detailed information about the number and types of construction equipment needed, maximum daily acreage disturbed, number of workers, and hours of operation is not currently known at this time. Thus, values for these parameters were estimated using the default values of URBEMIS 2007, including vehicle emission factors that are specific to the SJVAB, and SJVAPCD's Recommended Construction Fleet spreadsheet (SJVAPCD 2007x). SJVAPCD's spreadsheet provides estimates for the amount of maximum daily acreage disturbed and number and type of construction equipment that would be used on a project based on its total acreage and type (e.g., commercial, residential). SJVAPCD formulated this methodology to provide an accurate set of assumptions about the input parameters of a construction project while erring on the conservative side so as not to underestimate construction-generated emissions. The exhaust emissions of two off-road water trucks were also included as part of initial site preparation activity (e.g., grading). Table 4.2-6 summarizes the modeled project-generated, construction-related emissions of criteria air pollutants and ozone precursors from initial site preparation (e.g., grading) and building construction activities for the proposed project. Construction-related air quality effects were determined by comparing these modeling results with applicable SJVAPCD significance thresholds. Refer to Appendix C for detailed modeling input parameters, including the SJVAPCD-Recommended Construction Fleet spreadsheet, as well as modeling results.

Table 4.2-6
Summary of Modeled Project-Generated, Construction-Related Emissions of Criteria Air Pollutants and Precursors

Source	Emissions (Tons/Year)			
	ROG	NO_X	PM_{10} (Total) [1]	$PM_{2.5}$ (Total) [1]
Grading				
Fugitive Dust	0.0	0.0	16.7	3.5
Off-Road Diesel Exhaust	1.3	11.4	0.6	0.5
On-Road Diesel Exhaust	0.0	0.0	0.0	0.0
Worker Trips	0.0	0.0	0.0	0.0
Subtotal Unmitigated	1.4	11.4	17.3	4.0
Asphalt				
Off-Gas Emissions	0.1	0.0	0.0	0.0
Off-Road Diesel Exhaust	0.1	0.3	0.0	0.0
On-Road Diesel Exhaust	0.0	0.4	0.0	0.0
Worker Trips	0.0	0.0	0.0	0.0
Subtotal Unmitigated	0.2	0.7	0.1	0.0

Table 4.2-6
Summary of Modeled Project-Generated, Construction-Related Emissions of Criteria Air Pollutants and Precursors

Source	Emissions (Tons/Year)			
	ROG	NO_X	PM_{10} (Total) [1]	$PM_{2.5}$ (Total) [1]
Building Construction				
Off-Road Diesel Exhaust	1.0	11.9	0.4	0.4
Vendor Trips	1.0	11.8	0.6	0.5
Worker Trips	0.6	1.0	0.1	0.1
Subtotal Unmitigated	2.6	24.7	1.1	0.9
Architectural Coatings				
Off-Gas Emissions	12.9	0.0	0.0	0.0
Worker Trips	0.0	0.0	0.0	0.0
Subtotal Unmitigated	12.9	0.0	0.0	0.0
Total Unmitigated	17.0	36.8	18.4	5.0
Total with ISR Compliance	16.8	32.1	17.9	— [2]
SJVAPCD Significance Threshold	10	10	— [3]	— [3]

Notes: See Appendix C for detailed input parameters and modeling results.
[1] Shown for informational purposes only.
[2] This estimate does not account for dust control mitigation measures. Fugitive PM dust emissions are discussed separately below.
[3] SJVAPCD has not identified mass emissions thresholds for construction-related emissions of PM10 or PM2.5.
Sources: Modeling performed by EDAW 2007

As shown in Table 4.2-6, construction-related activities would result in project-generated annual unmitigated emissions of approximately 17 TPY of ROG and 37 TPY of NO_X. PM_{10} emissions from diesel equipment and worker commute trip exhaust are also shown in Table 4.2-6 because of their applicability to SJVAPCD Rule 9510, ISR rule, as discussed in detail below.

Based on the modeling conducted, construction-related activities would result in project-generated emissions of ROG and NO_X that exceed SJVAPCD's significance threshold of 10 TPY (refer to Table 4.2-6). Thus, project-generated, construction- related emissions of ozone precursors could violate or contribute substantially to an existing or projected air quality violation, and/or expose sensitive receptors to substantial pollutant concentrations, especially considering the nonattainment status of Merced County. As a result, this would be a ***significant*** impact.

Emissions of Fugitive PM Dust

Emissions of fugitive PM dust (e.g., PM_{10} and $PM_{2.5}$), are associated primarily with ground disturbance activities during initial site preparation (e.g., grading) and vary as a function of such parameters as soil silt content, soil moisture, wind speed, acreage of disturbance area, and vehicle miles traveled (VMT) on- and off-site. Exhaust emissions from diesel equipment and worker commute trips also contribute to short-term increases in PM emissions, but to a much lesser extent (see Table 4.2-6).

SJVAPCD's approach to CEQA analyses of construction-related fugitive PM_{10} dust emissions is to require implementation of effective and comprehensive control measures rather than a detailed quantification. SJVAPCD-recommended control measures beyond compliance with Regulation VIII-Fugitive Dust Prohibition, which is required by law, are not incorporated into the project design. Thus, project-generated, construction- related emissions of fugitive dust could violate or contribute substantially to an existing or projected air quality violation, and/or expose sensitive receptors to substantial pollutant concentrations, especially considering the nonattainment status of Merced County. As a result, this would be a ***significant*** impact.

Mitigation Measure 4.2-1a: Comply with SJVAPCD's Indirect Source Review Rule (Rule 9510). Construction of the proposed project shall comply with SJVAPCD's ISR rule (Rule 9510), as required by law. The applicant shall submit and have approved an Air Impact Assessment (AIA) application to SJVAPCD no later than applying for a final discretionary approval with the City of Merced. The AIA application shall be submitted on a form provided by the SJVAPCD and contain, but not be limited to, the applicant's name and address, detailed project description, on-site emission reduction checklist, monitoring and reporting schedule, and an AIA. The AIA shall quantify construction NO_X and PM_{10} emissions associated with the project. This assessment shall include: an estimate of construction emissions prior to the implementation of mitigation measures; a list of the mitigation measures to be applied to the project; an estimate of emissions for each applicable pollutant for the project, or each phase thereof, following the implementation of mitigation; and a calculation of the applicable off-site fee, if required by Rule 9510. The general mitigation requirements in the assessment, as contained in the ISR rule, shall include the following:

- Exhaust emissions for construction equipment greater than 50 horsepower used or associated with the development project shall be reduced by 20% of the total NO_X and by 45% of the total PM_{10} emissions from the statewide average as estimated by ARB.

- Methods employed by the applicant to reduce construction emissions to the degree noted above include using less polluting construction equipment, including the use of add-on controls, cleaner fuels, or newer lower emitting equipment. The emissions reduction targets listed above shall be met through any combination of on-site emission reduction measures or offset fees, including those required and additional measures listed in Mitigation Measure 4.2-1b below.

The requirements listed above can be met through any combination of on-site emission reduction measures or offset fees, including those required and additional measures listed in Mitigation Measures 4.2-1b and 4.2-1c below; however, any on-site emission reductions must be both quantifiable and verifiable to be credited towards the requirements of the ISR Rule.

Mitigation Measure 4.2-1b: Implement Measures to Reduce Construction-Related Diesel Equipment Exhaust Emissions. The following required mitigation measures shall be implemented by the project applicant to reduce construction-related diesel equipment exhaust emissions regardless of whether the emission reductions can be quantified and documented. However, any emissions reductions attained by these measures that can be quantified and documented can be credited to achieve the ISR reduction goals discussed in Mitigation Measure 4.2-1a. These required measures are listed below.

Required Measures to Reduce Construction-Related Diesel Equipment Exhaust Emission

- Cease construction activity on forecasted Spare the Air Days.

- Staging areas for heavy-duty construction equipment shall be located as far as possible from sensitive receptors. They shall be located on site and not be within 1,000 feet of the project boundary.

- Before construction contracts are issued, the project applicant shall perform a review of new technology in consultation with SJVAPCD, as it relates to heavy-duty diesel equipment, to determine what (if any) advances in emissions reductions are available for use and are economically feasible. Construction contract and bid specifications shall require contractors to utilize the available and economically feasible technology on a percentage of the equipment fleet, as determined by SJVAPCD.

- When not in use, idling of on-site equipment shall be minimized. Under no conditions shall on-site equipment be left idling for more than 5 minutes.

- Prohibit the use of trucks with off-road engines to haul materials on-site. Use trucks with on-road engines instead.

In addition, measures implemented to achieve the above ISR reduction goals required by Mitigation Measure 4.2-1a may include, but are not limited to the additional measures listed below.

Additional Operational Emission Reduction Measures

- Use alternate fuels and emission controls to further reduce NO_X and PM_{10} exhaust emissions above the minimum requirements set forth in the ISR rule.
- Replace/substitute fossil-fueled (e.g., diesel) equipment with electrically driven equivalents (provided they are not run via a portable generator set).
- Use ARB-certified alternative fueled engines in construction equipment. Alternative fueled equipment may be powered by compressed natural gas, liquid propane gas, electric motors, or other ARB-certified off-road technologies. (To find engines certified by ARB, see http://www.arb.ca.gov/msprog/offroad/cert/cert.php.)
- Provide commercial electric power to the project site in adequate capacity to avoid or minimize the use of portable electric generators and equipment.
- Limit the hours of operation of heavy duty diesel equipment and/or the amount of equipment in use at any one time.

Mitigation Measure 4.2-1c: Implement an Emissions Reduction Agreement with SJVAPCD to Reduce Construction Emissions of ROG and NO_X. The Applicant shall enter into an emissions reduction agreement with SJVAPCD to reduce net ROG and NO_x emissions to less than 10 TPY. This agreement includes an emission reduction program, whereby the Applicant funds projects in the SJVAB, such as replacement and destruction of old engines with new more efficient engines. The agreement requires the Applicant to identify and propose opportunities for the reduction of emissions to fully mitigate the project's construction emissions to less than significant, and includes opportunities for removal or retrofication of stationary, transportation, indirect, and/or mobile-source equipment. Each proposal requires SJVAPCD approval and verification of emission reduction prior to receiving final discretionary approval of the project from the City of Merced. The emissions reduction agreement must be implemented *in addition to* the Required Measures to Reduce Construction-Related Diesel Equipment Exhaust Emission listed in Mitigation Measure 4.2-1b. Development and implementation of the emissions reduction agreement shall be fully funded by the Applicant. To the extent feasible, preference shall be given to off-site emission reduction projects that are located in or in close proximity to the City of Merced. If approved by SJVAPCD, the Applicant may develop an emissions reduction agreement that also fulfills the compliance requirements of SJVAPCD's ISR Rule (Rule 9510).

Mitigation Measure 4.2-1d: Comply with SJVAPCD's Regulation VIII-Fugitive Dust Prohibitions and Implement All Applicable Control Measures. Construction of the proposed project shall comply with SJVAPCD's Regulation VIII-Fugitive Dust Prohibitions and implement all applicable control measures, as required by law. Regulation VIII contains, but is not limited to, the following required control measures:

- Prewater site sufficient to limit visible dust emissions (VDE) to 20% opacity.
- Phase work to reduce the amount of disturbed surface area at any one time.
- During active operations, apply water or chemical/organic stabilizers/suppressants sufficient to limit VDE to 20% opacity.
- During active operations, construct and maintain wind barriers sufficient to limit VDE to 20% opacity.
- During active operations, apply water or chemical/organic stabilizers/suppressants to unpaved haul/access roads and unpaved vehicle/equipment traffic areas sufficient to limit VDE to 20% opacity and meet the conditions of a stabilized unpaved road surface.

- An owner/operator shall limit the speed of vehicles traveling on uncontrolled unpaved access/haul roads within construction sites to a maximum of 15 miles per hour (mph).
- An owner/operator shall post speed limit signs that meet State and Federal Department of Transportation standards at each construction site's uncontrolled unpaved access/haul road entrance. At a minimum, speed limit signs shall also be posted at least every 500 feet and shall be readable in both directions of travel along uncontrolled unpaved access/haul roads.
- When handling bulk materials, apply water or chemical/organic stabilizers/suppressants sufficient to limit VDE to 20% opacity.
- When handling bulk material, construct and maintain wind barriers sufficient to limit VDE to 20% opacity and with less than 50% porosity.
- When storing bulk materials, comply with the conditions for a stabilized surface as listed above.
- When storing bulk materials, cover bulk materials stored outdoors with tarps, plastic, or other suitable material and anchor in such a manner that prevents the cover from being removed by wind action.
- When storing bulk materials construct and maintain wind barriers sufficient to limit VDE to 20% opacity and with less than 50% porosity. If utilizing fences or wind barriers, apply water or chemical/organic stabilizers/suppressants to limit VDE to 20% opacity or utilize a 3-sided structure with a height at least equal to the height of the storage pile and with less than 50% porosity.
- Limit vehicular speed while traveling on the work site sufficient to limit VDE to 20% opacity.
- Load all haul trucks such that the freeboard is not less than 6 inches when material is transported across any paved public access road sufficient to limit VDE to 20% opacity.
- Apply water to the top of the load sufficient to limit VDE to 20% opacity.
- Cover haul trucks with a tarp or other suitable cover.
- Clean the interior of the cargo compartment or cover the cargo compartment before the empty truck leaves the site; and prevent spillage or loss of bulk material from holes or other openings in the cargo compartment's floor, sides, and/or tailgate; and load all haul trucks such that the freeboard is not less than 6 inches when material is transported on any paved public access road, and apply water to the top of the load sufficient to limit VDE to 20% opacity; or cover haul trucks with a tarp or other suitable cover.
- Owners/operators shall remove all visible carryout and trackout at the end of each workday.
- An owner/operator of any site with 150 or more vehicle trips per day, or 20 or more vehicle trips per day by vehicles with three or more axles shall take actions for the prevention and mitigation of carryout and trackout.
- Within urban areas, an owner/operator shall prevent carryout and trackout, or immediately remove carryout and trackout when it extends 50 feet or more from the nearest unpaved surface exit point of a site.
- Within rural areas, construction projects 10 acres or more in size, an owner/operator shall prevent carryout and trackout, or immediately remove carryout and trackout when it extends 50 feet or more from the nearest unpaved surface exit point of a site.
- For sites with paved interior roads, an owner/operator shall prevent and mitigate carryout and trackout.

- Cleanup of carryout and trackout shall be accomplished by manually sweeping and picking-up; or operating a rotary brush or broom accompanied or preceded by sufficient wetting to limit VDE to 20% opacity; or operating a PM_{10}-efficient street sweeper that has a pick-up efficiency of at least 80%; or flushing with water, if curbs or gutters are not present and where the use of water would not result as a source of trackout material or result in adverse impacts on storm water drainage systems or violate any National Pollutant Discharge Elimination System permit program.

- An owner/operator shall submit a Dust Control Plan to the Air Pollution Control Officer (APCO) before the start of any construction activity on any site that will include 10 acres or more of disturbed surface area for residential developments, or 5 acres or more of disturbed surface area for nonresidential development, or will include moving, depositing, or relocating more than 2,500 cubic yards per day of bulk materials on at least 3 days. Construction activities shall not commence until the APCO has approved or conditionally approved the Dust Control Plan. An owner/operator shall provide written notification to the APCO within 10 days before the commencement of earthmoving activities via fax or mail. The requirement to submit a dust control plan shall apply to all such activities conducted for residential and nonresidential (e.g., commercial, industrial, or institutional) purposes or conducted by any governmental entity.

Mitigation Measure 4.2-1e: Implement SJVAPCD-Recommended Enhanced and Additional Dust Control Measures. The following SJVAPCD-recommended enhanced and additional control measure shall be implemented to further reduce emissions of fugitive PM_{10} dust.

- Install sandbags or other erosion control measures to prevent silt runoff to public roadways from adjacent project areas with a slope greater than 1%.

- Suspend excavation and grading activity when winds exceed 20 mph.

- Limit area subject to excavation, grading, and other construction activity at any one time.

Implementation of Mitigation Measures 4.2-1a and -1b would result in the required minimum 20% reduction in NO_X emissions and a 45% reduction in PM_{10} emissions from heavy-duty diesel equipment, as compared with statewide average emissions. In addition, implementation of these measures would also result in a 5% reduction in ROG emissions from heavy-duty diesel equipment. All or part of the reductions may result from on-site equipment and fuel selection; the remainder would result from off-site reductions achieved through the payment of fees. Implementation of Mitigation Measure 4.2-1c would ensure the additional emissions reduction necessary to reduce construction-generated ROG and NO_x emissions to levels below 10 TPY. As a result, this impact (generation of construction-related ROG and NO_X emissions) would be reduced to a ***less-than-significant*** **level**.

With respect to fugitive PM_{10} dust emissions, implementation of Mitigation Measures 4.2-1d and 4.2-1e would ensure compliance with Regulation VIII, which is required by law, and include additional SJVAPCD-recommended control measures. As a result, this impact (generation of construction-related fugitive PM_{10} dust emissions) would be reduced to a ***less-than-significant*** level.

IMPACT 4.2-2 Generation of Long-Term Operation-Related (Regional) Emissions of Criteria Air Pollutants and Precursor Emissions. *Operation-related activities would result in project-generated emissions of ROG and NO_X that exceed SJVAPCD's significance threshold of 10 TPY (refer to Table 4.2-7). Thus, project-generated, operation-related emissions of criteria air pollutants and precursors could violate or contribute substantially to an existing or projected air quality violation, and/or expose sensitive receptors to substantial pollutant concentrations, especially considering the nonattainment status of Merced County. In addition, because SJVAPCD's significance thresholds approximately correlate with reductions from heavy-duty vehicles and land use project emission reduction requirements in the SIP, project-generated emissions could also conflict with any air quality planning efforts. As a result, this would be a* ***significant*** *impact.*

Area- and Mobile-Source Emissions

Project-generated, regional area- and mobile-source emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ were estimated using URBEMIS 2007 Version 9.2.2 computer program (ARB 2007x), which is designed to model emissions for land use development projects. URBEMIS allows land use selections that include project location and trip generation rates. URBEMIS accounts for area-source emissions from the usage of natural gas, landscape maintenance equipment, and consumer products; and mobile-source emissions associated with vehicle trips. Regional area- and mobile-source emissions were estimated based on the proposed land uses type and size identified in Chapter 3, "Project Description," the increase in trip generation from the traffic analysis prepared for this project (DKS Associates 2008), Section 4.11 "Traffic and Transportation," and default and SJVAPCD-recommended settings and parameters attributable to land use type and site location (SJVAPCD 2007x). This analysis does account for the fact that some outbound delivery truck trips from the Merced Distribution Center to the 49 existing Wal-Mart stores that it would serve would replace outbound delivery truck trips that are currently based at other existing Wal-Mart distribution centers. Results of the URBEMIS modeling, including the net results, are shown in Table 4.2-7.

Table 4.2-7
Summary of Modeled Project-Generated, Operation-Related Emissions of Criteria Air Pollutants and Precursors

Source	Emissions (Tons/Year)[1]			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
Area Source[2]				
Natural Gas	0.0	0.3	0.0	0.0
Landscaping	0.0	0.0	0.0	0.0
Architectural Coatings	1.3	0.0	0.0	0.0
Mobile Source				
Employee Commute Trips	5.1	3.6	1.6	0.4
Outbound Delivery Truck Trips[3]				
Proposed Project[4]	11.7	176.1	104.5	22.9
Existing[5]	6.7	122.5	73.9	16.0
Net[6]	5.0	53.6	30.6	6.9
Inbound Receivable Truck Trips[3]				
Proposed Project[7]	12.0	220.5	133.1	28.8
Existing[7]	12.0	220.5	133.1	28.8
Net Change[6]	0.0	0.0	0.0	0.0
On-Site Truck Activity				
Haul Truck Idling[8]	0.5	2.9	0.2	0.2
Haul Truck Travel[8]	0.6	4.9	0.1	0.1
Yard Truck Idling[9]	0.8	6.1	0.4	0.3
Yard Truck Travel[9]	0.2	1.4	0.1	0.1
Total (Net) Unmitigated	13.5	72.7	32.9	8.0
Total with ISR Compliance) [10]	No ISR requirement	48.7	16.5	No ISR requirement
SJVAPCD Significance Threshold	10	10	–[11]	–[11]

1 Except for emissions generated by on-site haul truck activity, all emissions were modeled using the URBEMIS 2007 Version 9.2.2 computer model, based on trip generation rates obtained from the traffic analysis, and implementing SJVAPCD's Recommended Standard Changes to URBEMIS Default Values (SJVAPCD 2007x).

2 Emissions from the periodic testing of the back-up generator and fire-water pump are not included because the amount of operation from periodic testing and maintenance would be nominal at an estimated 52 hours per year. Refer to stationary-source emissions discussion below.

3 According to the traffic analysis, a total of 644 truck trips would be generated by the proposed Merced Distribution Center. It is assumed that half of these truck trips would be associated with truck deliveries from the distribution center to retail stores (322 *outbound* delivery truck trips) and that the other half of trips would be associated with deliveries of goods to the distribution center (322 *inbound* receivable truck trips). The

Table 4.2-7
Summary of Modeled Project-Generated, Operation-Related Emissions of Criteria Air Pollutants and Precursors

Source	Emissions (Tons/Year)[1]			
	ROG	NO_X	PM_{10}	$PM_{2.5}$

emission estimates for outbound and inbound truck trips do not account for Wal-Mart's participation in EPA's SmartWay Transport Partnership or installation of auxiliary power units on its overnight truck fleet, which aim to increase energy efficiency and reduce emissions from ground freight carriers (EPA 2007).

[4] It is assumed that the average trip distance for all 322 outbound delivery truck trips would be equal to the average trip distance (in the San Joaquin Valley Air Basin) from the proposed distribution center to the 49 existing Wal-Mart stores that would be served by the Merced Distribution Center, which is 83.0 miles per trip, as provided by Wal-Mart (McAlexander, pers. comm., 2007).

[5] The trip generation rate and average trip distance (106.2 miles in the San Joaquin Valley Air Basin per trip) for existing outbound delivery trucks are based on existing conditions data provided by Wal-Mart for the 49 existing stores that would be supplied by the Merced Distribution Center (McAlexander, pers. comm., 2007).

[6] Net emissions are equal to emissions generated by the proposed project minus existing emissions.

[7] It is assumed that the average trip distance in the San Joaquin Valley Air Basin for all inbound receivable truck trips, with and without the proposed project, would be equal to the average existing trip distance of 106.2 miles between the 49 existing Wal-Mart stores that would be served by the Merced Distribution Center and their exist distribution center currently used by such trucks; these existing centers are located in Red Bluff and Porterville.

[8] Emissions generated by on-site travel and idling by haul trucks were estimated separately using emission factors from the EMFAC2007 Version 2.3 model (ARB 2006x).

[9] Emissions generated by on-site travel and idling by off-road yard trucks were estimated using emission factors derived from URBEMIS 2007 Version 9.2.2 (ARB 2007x).

[10] SJVAPCD's ISR Rule (Rule 9510) requires a 33% reduction in operational emissions of NO_X and a 50% reduction in PM_{10} over 10 years.

[11] The SJVAPCD has not identified mass emissions thresholds for operational emissions of PM_{10} and $PM_{2.5}$.

See Appendix C for detailed input parameters and modeling results.

Sources: Modeling performed by EDAW 2007

In addition, emissions from on-site activity by on-road haul trucks and off-road yard trucks were estimated separately using emission factors from EMFAC2007 Version 2.3 (ARB 2006x) and project-specific assumptions for on-site travel distances and idling times used in the HRA prepared for this project (Refer to Impact 4.2-4).

Results of the URBEMIS modeling, including the net results of changes in regional truck operations and emissions from on-site truck activity, are shown in Table 4.2-7. As shown in the Table 4.2-7, operation-related activities would result in project-generated annual unmitigated emissions of approximately 14 TPY of ROG, 73 TPY of NO_X, 33 TPY of PM_{10} and 8 TPY of $PM_{2.5}$. Based on the modeling conducted, operation-related activities would result in project-generated emissions of ROG and NO_X that exceed SJVAPCD's significance threshold of 10 TPY (refer to Table 4.2-7). Thus, project-generated, operation-related emissions of criteria air pollutants and precursors could violate or contribute substantially to an existing or projected air quality violation, and/or expose sensitive receptors to substantial pollutant concentrations, especially considering the nonattainment status of the San Joaquin Valley Air Basin within (and outside of) Merced County. In addition, because SJVAPCD's significance thresholds approximately correlate with reductions from heavy-duty vehicles and land use project emission reduction requirements of the SIP, project-generated emissions could also conflict with current air quality planning efforts. As a result, this would be a ***significant*** impact.

Stationary-Source Emissions

The proposed project would include stationary sources of pollutants that would be required to obtain permits to operate under SJVAPCD Rule 2201-New and Modified Stationary Sources. These sources could include, but not be limited to, diesel-engine generators for emergency power generation and a charbroil grill at the employee cafeteria. The permit process would assure that these sources would be equipped with the required emission controls, and that individually, these sources would not cause a significant environmental impact. These sources

would not be subject to the ISR rule. An HRA for these sources, as well as on-site activity by diesel-engine trucks is discussed in Impact 4.2-4. Nonetheless, the emissions from these sources would be additive to modeled area- and mobile-source emissions described above.

Mitigation Measure 4.2-2a: Comply with SJVAPCD's Indirect Source Review Rule (Rule 9510)

Similar to Mitigation Measure 4.2-1a, which addresses construction-related emissions, operation of the proposed project shall comply with SJVAPCD's ISR rule (Rule 9510), as required by law. The applicant shall submit an AIA application to SJVAPCD no later than applying for a final discretionary approval with the City of Merced. The AIA application shall be submitted on a form provided by the SJVAPCD and contain, but not be limited to, the applicant's name and address, detailed project description, on-site emission reduction checklist, monitoring and reporting schedule, and an AIA. The AIA shall quantify operational NO_X and PM_{10} emissions associated with the project. This shall include the estimated operational baseline emissions (i.e., before mitigation), and the mitigated emissions for each applicable pollutant for the project, or each phase thereof, and shall quantify the off-site fee, if applicable. General mitigation requirements, as contained in the ISR rule, include the following:

- Applicants shall reduce 33.3%, of the project's operational baseline NO_X emissions over a period of ten years as quantified in the approved AIA.

- Applicants shall reduce 50% of the project's operational baseline PM_{10} emissions over a period of ten years as quantified in the approved AIA.

The requirements listed above can be met through any combination of on-site emission reduction measures or offset fees, including those required and additional measures listed in Mitigation Measures 4.2-2b, 4.2-2c, 4.2-2d, and 4.2-2e for emissions of CAPs; and Mitigation Measures 4.2-6b and 4.2-6d for emissions of GHGs below; however, any on-site reductions of CAP emissions must be both quantifiable and verifiable to be credited towards the requirements of the ISR Rule.

Mitigation Measure 4.2-2b: Develop and Implement an Employee Trip Reduction Program to Reduce Operational Emissions.

The applicant shall develop and implement an employee trip reduction program that minimizes the percentage of employee commute trips in single occupancy vehicles. At a minimum, the program shall ensure that at least 25% of employee commute trips occur by some other transportation mode than a single occupancy vehicle. This program shall be fully funded by the applicant and be developed in consultation with the City of Merced, the Transit Joint Powers Authority for Merced County, and SJVAPCD. Measures that result in quantifiable trip reductions can also be counted as reductions in NO_X and PM_{10} emissions with respect to compliance with the ISR rule mentioned in Mitigation Measure 4.2-2a. The program shall be managed by an on-site Employee Transportation Coordinator employed and appointed by the applicant. A designated Transportation Manager shall also be on duty during each shift to manage the program. The 25% reduction in single occupancy vehicle trips by employees shall be achieved within 3 years of the opening of the distribution center. The reduction program and its effectiveness shall be evaluated annually and reported to the City of Merced. As part of the program, the applicant shall provide a display case or kiosk that displays all of the program information in a prominent area accessible to employees (e.g., break room, cafeteria, or entrance). Elements of the employee trip reduction program may include, but are not limited to, the following measures:

- Provide carpool ride matching assistance for employees, assistance with vanpool formation, and provisions of vanpool vehicles.

- Provide a separate site entrance exclusively for employee shuttles, carpools, vanpools, public transit, and cyclists that allows for more convenient and expedient access to and from the site during peak turnover periods (i.e., shift changes).

- Design and provide preferential parking for carpool and vanpool vehicles. Design features may include a separate parking lot for carpool and vanpool vehicles that is closer to the employee building entrance than the parking lot for single occupancy vehicles and/or covered parking spaces for carpool and vanpool vehicles. Other potential design features include connecting the preferential parking lot to the employee entrance of the building with shaded, landscaped walkways or with open-air, covered walkways.

- Implement parking fees for single occupancy vehicle commuters or a parking cash-out program for employees.

- Make available free public transit passes to all employees if public transit service is expanded to serve the project site.

- Provide adequate bicycle parking/racks in a covered, secure area.

- Provide an adequate number of showers, changing areas, and locker facilities to accommodate employees who bike to work (typically one shower and 3 lockers for every 25 employees of a shift).

- Fund the design and installation of bikeways or bike lanes along local roads that provide access to the site.

- Implement compressed work schedules for employees (e.g., 4 shifts per week for full time employees).

- Operate free employee shuttle or vanpool system that serves employees according to their shift times and places of residence. Low-emissions shuttle or vanpool vehicles shall be used (e.g., hybrid, CGN, or electric). Provide a covered area for the on-site employee shuttle stop or vanpool parking lot and an open-air covered walkway connection to the employee entrance of the building to provide summertime shade and protection from rain.

- Provide incentives for employees who take their children to child daycare centers to select nearby centers and designate these centers as official stops of the free employee shuttle or vanpool system. Incentives may include, but are not limited to, the subsidization of daycare rates or the negotiation of group discounts for children of employees at these childcare providers. An on-site child daycare center shall be provided only if supported by the findings of a comprehensive HRA performed in consultation with SJVAPCD.

- Time employee work shifts according to the class times at nearby K–12 schools and/or have employee shuttles or vanpools make stops at nearby K–12 schools.

Mitigation Measure 4.2-2c: Implement Recommended Mitigation Measures to Reduce Operational Emissions.

The following required mitigation measures shall be implemented by the project applicant to reduce operation-related emissions regardless of whether the emission reductions can be quantified and documented for compliance with the ISR rule required by Mitigation Measure 4.2-2a or whether they result in a quantifiable reduction of employee commute trips in single occupancy vehicles. However, any emissions reductions attained by these measures that can be quantified and documented can be credited to achieve the ISR reduction goals discussed in Mitigation Measure 4.2-2a.or employee trip reduction goals discussed in Mitigation Measure 4.2-2b. These required measures are listed below.

- The applicant's participation in EPA's SmartWay Transport Partnership (EPA 2007) shall include the portion of its haul truck fleet that is based at or serves the Merced distribution center and shall continue participation of this truck fleet in the Partnership for as long as the Partnership or a similar successor program exists.

- The Applicant shall fully fund or contribute its fair share of funding for the development of a Class II Bike Lanes along Childs Avenue and Gerard Avenue from Parsons Avenue to the project's eastern boundary line that would connect the proposed project to nearby land uses, including the residential neighborhoods to the

west along Childs Avenue and Gerard Avenue. Building bicycle lanes at these locations is consistent with the City of Merced Bicycle Plan, which was adopted on October 20, 2008 and meets requirements of the California Bicycle Transportation Act (1994) and qualifies the City of Merced to receive state funding for bicycle projects. The City shall determine the Applicant's fair share monetary contribution to the development of these bicycle lanes and the Applicant shall pay its fair share at the same time building permit fees are due to the City.

- Provide on-site shops and services for employees including a cafeteria and a bank/ATM.

- Use only electric-powered landscape maintenance equipment to care for landscaped areas. If this work is hired out to a landscaping company, then the contract shall prohibit the use of gasoline or diesel powered landscape maintenance equipment.

- Building and site design shall include electrical outlets around the exterior of the units to enable use of electric landscape maintenance equipment.

Mitigation Measure 4.2-2d: Implement Additional Operational On-Site Emission Reduction Measures.

- Where feasible, additional measures shall be implemented to reduce operational emissions. Such measures shall include, but are not limited to the additional measures listed below. If, however, the additional measures listed below are technologically or economically infeasible, the Applicant shall submit a written report to the City of Merced Planning & Permitting demonstrating such infeasibility. Approval of this report shall be received by the Applicant prior to receiving final discretionary approval of the project from the City of Merced Planning & Permitting. Purchase and operate electric or hybrid-powered yard tractors (e.g., Volk-brand tractors) to serve as "yard trucks" that move trailers to and from the trailer yard and loading docks.

- Provide electric maintenance equipment, install solar, low-emission, or central water heaters, increase building insulation beyond Title 24 requirements, orient buildings to take advantage of solar heating and natural cooling and use passive solar designs, energy efficient windows (double pane and/or Low-E), highly reflective roofing materials, cool pavement, radiant heat barrier, install photovoltaic cells, programmable thermostats for all heating and cooling systems, awnings or other shading mechanisms for windows, patio, and walkway overhangs, ceiling fans, utilize passive solar cooling and heating designs, utilize day lighting systems such as skylights, light shelves, and interior transom windows.

- The project shall include as many clean alternative energy features as possible to promote energy self-sufficiency (e.g., photovoltaic cells, solar thermal electricity systems, small wind turbines).

Mitigation Measure 4.2-2e: Implement an Emissions Reduction Agreement with SJVAPCD to Reduce Operational Emissions of ROG and NO_X.

The Applicant shall enter into an emissions reduction agreement with SJVAPCD to reduce net ROG and NO_x emissions to less than 10 TPY. This agreement includes an emission reduction program, whereby the applicant funds projects in the SJVAB, such as replacement and destruction of old engines with new more efficient engines. The agreement requires the Applicant to identify and propose opportunities for the reduction of emissions to fully mitigate the project's operational emissions of ROG and NO_x to less than 10 TPY, and includes opportunities for removal or retrofit of stationary, transportation, indirect, and/or mobile-source equipment. Each proposal requires SJVAPCD approval and verification of emission reduction prior to receiving final discretionary approval of the project from the City of Merced. The emissions reduction agreement shall be implemented *in addition to* the Employee Trip Reduction Program required by Mitigation Measure 4.2-2b, the set of Recommended Mitigation Measures to Reduce Operational Emissions required by Mitigation Measure 4.2-2c, and the set of Additional Operational On-Site Emission Reduction Measures required by Mitigation Measure 4.2-d. However, any emission reductions achieved through these measures that are quantifiable and verifiable could effectively reduce the amount of additional, off-site reductions that must be obtained through the emissions reduction agreement. (Furthermore,

any quantifiable and verifiable emissions of CAPs that would result as an added benefit from implementation of Mitigation Measures 4.2-6b and 4.2-6d, which are designed to achieve GHG reductions as discussed under Impact 4.2-6 below, could also effectively reduce the amount of additional, off-site reductions that must be obtained through the emissions reduction agreement.) To the extent feasible, the selection of program for reducing operational emissions of CAPs established in the agreement shall give preference to off-site emission reduction projects that are located in or in close proximity to the City of Merced. If approved by SJVAPCD the Applicant may develop an emissions reduction agreement that also fulfills the compliance requirements of SJVAPCD's ISR Rule (Rule 9510) discussed in Mitigation Measure 4.2-2a. Development and implementation of the emissions reduction agreement shall be fully funded by the Applicant.

Implementation of Mitigation Measure 4.2-2a would result in at least the required minimum 33.3% reduction in NO_X emissions and a 50% reduction in PM_{10}. If these reductions are not attained by the on-site measures described above, they would occur through off-site reductions as a result of payment of fees collected by SJVAPCD. Implementation of Mitigation Measure 4.2-2b would result in emissions generated by employee commute trips. (Implementation of Mitigation Measure 4.2-2b may also have the added benefit of lessening traffic congestion and traffic noise levels on area roads.) Implementation of these measures as well as Mitigation Measures 4.2-2c and 4.2-2d would reduce project-generated, operational emissions of ROG and NO_X. Implementation of Mitigation Measure 4.2-2e would ensure the additional emissions reduction necessary to reduce operational emissions of ROG and NO_x to levels below 10 TPY. As a result, this impact would be reduced to a ***less-than-significant*** level.

IMPACT 4.2-3 Generation of Long-Term, Operation-Related (Local) Mobile-Source Emissions of CO. *Based on SJVAPCD's screening criteria, project-generated long-term operational local mobile-source emissions of CO would not result in or substantially contribute to emissions concentrations that exceed the 1-hour ambient air quality standard of 20 ppm or the 8-hour standard of 9 ppm, respectively. As a result, this impact would be less than significant.*

CO concentration is a direct function of motor vehicle activity, particularly during peak commute hours, and meteorological conditions. Under specific meteorological conditions, CO concentrations may reach unhealthy levels with respect to local sensitive land-uses such as residential areas, schools, and hospitals. As a result, the SJVAPCD recommends analysis of CO emissions at a local rather than a regional level. Because of the fact that increased CO concentrations are usually associated with roadways that are congested and with heavy traffic volume, the SJVAPCD has established preliminary screening criteria to determine with fair certainty that, if not violated, project-generated long-term operational local mobile-source emissions of CO would not result in or substantially contribute to emissions concentrations that exceed the 1-hour ambient air quality standard of 20 ppm or the 8-hour standard of 9 ppm, respectively. SJVAPCD's preliminary screening criteria consist of the following:

- A traffic study for the project indicates that the Level of Service (LOS) on one or more streets or at one or more intersections in the project vicinity would be reduced to LOS E or F, or

- A traffic study for the project indicates that implementation would substantially worsen an already existing LOS F on one or more streets or at one or more intersections in the project vicinity (SJVAPCD 2002).

According to the traffic analysis prepared for this project, all affected signalized intersections would operate at LOS D or better under 2010 background plus project conditions and under cumulative plus project (2030) conditions during both AM and PM peak hours. The intersections of SR 140 and Baker Drive, Childs Avenue and the SR 99 southbound off-ramp, and Childs Avenue and the SR 99 northbound off-ramp are projected to be at LOS E or F during the AM and/or PM peak hours under 2010 background conditions with or without the project (DKS Associates 2008). However, these intersections are unsignalized (all-way stop controlled) and would not serve heavy traffic volumes that could generate substantial localized concentrations of CO. Also, traffic generated by the project would not result in excessive idling or substantially worsen any area street segments in any other way.

Intersections controlled by stop signs do not experience high enough traffic volumes and associated congestion to result in violations of the AAQS; therefore, CO modeling is not recommended for unsignalized intersections (Garza et al. 1997). Because the intersections controlled by stop signs would accommodate fewer vehicles than signalized intersections, it is reasonable to conclude that congestion at the intersections controlled by stop signs would not result in CO concentrations that exceed the AAQS.

Some signalized intersections in the vicinity of the project area are predicted to operate at an unacceptable LOS (i.e., LOS E or F) under cumulative conditions in the year 2030 with or without the traffic that would be generated by the proposed project (DKS Associates 2008). Because of stricter vehicle emissions standards in newer cars, new technology, and increased fuel economy, future CO emission factors under cumulative conditions (analysis year 2030) would be substantially lower than those under existing conditions.

Thus, based on the screening criteria above, project-generated long-term operational local mobile-source emissions of CO would not result in or substantially contribute to emissions concentrations that exceed the 1-hour ambient air quality standard of 20 ppm or the 8-hour standard of 9 ppm, respectively. As a result, this impact would be ***less than significant***.

Mitigation Measure

No mitigation is required.

IMPACT 4.2-4 **Exposure of Sensitive Receptors to Emissions of Toxic Air Contaminants.** *Construction and operation of the proposed project would result in increased health risk levels associated with short-and long-term emissions of diesel PM and other TACs. However, the incremental increase in health risk levels, including cancer risk and noncancer chronic risk, would not exceed applicable thresholds at nearby sensitive receptors. As a result, this impact would be* ***less than significant****.*

The exposure of sensitive receptors to emissions of TACs from on-site sources during construction and operation of the proposed project are discussed separately below.

Short-term Construction-Related Emissions

Construction-related activities would result in temporary, short-term project-generated emissions of diesel PM from the exhaust of off-road heavy-duty diesel equipment for site preparation (e.g., demolition, excavation, grading, and clearing); paving; application of architectural coatings; and other miscellaneous activities. As shown in Table 4.2-6, off-road diesel-powered equipment operated during project construction would generate approximately 2 tons of diesel PM exhaust emissions at the project site during the one-year construction effort (i.e., off-road diesel exhaust during site preparation, actual building construction, and asphalt paving). This amount would be lower with implementation of Mitigation Measure 4.2-1a because the NO_X and PM_{10} reduction measures required by the ISR rule would also result in reduced emissions of diesel PM. Diesel PM was identified as a TAC by ARB in 1998. The potential cancer risk from the inhalation of diesel PM, as discussed below, outweighs the potential for all other health impacts (ARB 2003). At this time, SJVAPCD has not adopted a methodology for analyzing such impacts and does not recommended the completion of HRAs for construction-related emissions of TACs, with a few exceptions (e.g., where construction phase is the only phase of project) (Reed, pers. comm., 2007).

In January 2001, EPA promulgated a Final Rule to reduce emission standards for 2007 and subsequent model year heavy-duty diesel engines. These emission standards represent a 90% reduction in NO_X, 72% reduction of nonmethane hydrocarbon emissions, and 90% reduction of PM emissions in comparison to the 2004 model year emission standards. In December 2004, ARB adopted a fourth phase of emission standards (Tier 4) in the Clean Air Non-road Diesel Rule that are nearly identical to those finalized by EPA on May 11, 2004. As such, engine manufacturers are now required to meet after treatment-based exhaust standards NO_X and PM starting in 2011

that are more than 90% lower than current levels, putting emission factors from off-road engines virtually on par with those from on-road heavy-duty diesel engines.

The dose to which receptors are exposed is the primary factor used to determine health risk (i.e., potential exposure to TAC emission levels that exceed applicable standards). Dose is a function of the concentration of a substance or substances in the environment and the duration of exposure to the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the maximally exposed individual. Thus, the risks estimated for a maximally exposed individual are higher if a fixed exposure occurs over a longer period of time. According to the Office of Environmental Health Hazard Assessment, health risk assessments, which determine the exposure of sensitive receptors to TAC emissions, should be based on a 70-year exposure period; however, such assessments should be limited to the period/duration of activities associated with the proposed project (Salinas, pers. comm., 2004). Thus, because the use of off-road heavy-duty diesel equipment would be temporary in combination with the highly dispersive properties of diesel PM (Zhu and Hinds 2002) and further reductions in exhaust emissions, project-generated, construction-related emissions of TACs would not expose sensitive receptors to substantial emissions of TACs. Compliance with the ISR rule, as required by law, would also reduce diesel PM exhaust emissions. As a result, this impact would be less than significant.

Long-Term Operation-Related Emissions

A HRA was performed to assess the potential health risk associated with TACs generated by the operation of the proposed project, which would occur for an indefinite length of time. This HRA was performed, according to the recommendation of the SJVAPCD, to determine the exposure (i.e., risk levels) of existing nearby sensitive-receptors (e.g., residences, worker locations, and schools) from on-site TAC emission sources. The need to conduct a site-specific HRA was also supported by the recommendations of ARB in its Air Quality and Land Use Handbook, which suggest that an HRA be performed before locating a distribution center and sensitive receptors within 1,000 feet of each other (ARB 2005).

Implementation of the proposed project would result in TAC emissions from various operation-related activities, including diesel PM from on-site travel and idling by haul trucks and yard trucks, transport refrigeration units, the diesel-powered backup generator and fire-water pump; and naphthalene and polycyclic aromatic hydrocarbons from the grill in the employee cafeteria.

For emission sources of diesel PM, air quality dispersion modeling was conducted using the EPA AERMOD model (Version 07026) with the ISC-AERMOD View interface (Version 5.6) (Lakes Environmental Software 2007) to determine the concentration levels at existing nearby sensitive receptors. Emission rates for (on-road) haul trucks, (off-road) yard trucks, transport refrigeration units, backup generator, and the fire-water pump were based on those in the SJVAPCD Modeling Guidance, equipment manufacturer specifications, or particulate matter standards for the pertinent class of diesel-powered internal combustion engines. To evaluate potential health risk associated with operation of the cafeteria, dispersion and risk modeling were performed using the Hotspots Analysis Reporting Program (HARP) software package (Version 1.3, updated October 2006) developed by ARB for conducting health risk assessments (ARB 2006x). Emissions of organic gases from the on-site cafeteria were evaluated using an air toxic pollutant surrogate for the total mass estimate for organic gases, in accordance with SJVAPCD Modeling Guidance (SJVAPCD 2007x). In addition to emission rate information, all air dispersion modeling was based on five sequential years of hourly preprocessed meteorological data provided by SJVAPCD and terrain data from the U.S. Geological Survey (U.S. Geological Survey 2006). Variable emission correction factors were incorporated into the modeling to account for proportionally higher levels of emissions activity during peak daytime hours compared to late evening hour and early morning hours when operational activity is generally lower.

The HRA evaluated increased cancer risk and chronic noncancer health hazards at specific nearby locations where people may be exposed to emissions of TACs, including residences, schools, and worker sites (A detailed map of

these discrete receptor locations is shown in Figure 2 of Appendix C. Carcinogenic risks and potential chronic noncancer health effects were assessed using the dispersion modeling, as described in the preceding sections, and numerical values of toxicity provided by OEHHA (OEHHA 2003). The HRA evaluated cancer and noncancer health effects from inhalation exposure at individual sensitive receptors, including nearby residences, worker sites, and schools. Exposure levels at both existing and future planned sensitive receptors were assessed. Because the pollutants of concern do not have published toxicity factors for short-term (acute) exposure, this HRA evaluated only potential long-term health impacts.

Health risk impacts were identified at actual locations of residential and worker receptors within a 1-mile radius of the proposed project site. A summary of maximum cancer risk and noncancer health impacts values is shown in Table 4.2-8.

Of the 10 residential locations identified (as shown in Figure 2 of the HRA in Appendix C) for evaluating the maximum increase in individual health risk impacts, the incremental increase in cancer risk at the Maximum Exposed Individual Receptor (MEIR) was determined to be 7.3 in 1 million (Table 4.2-8). The HI for increased noncancer chronic risk at the MEIR was determined to be 0.0086 (Table 4.2-8). Both the MEIR for increased cancer risk and highest HI for noncancer chronic risk occurred at the same residential receptor, an existing residence located less than a mile southwest of the proposed project site.

Table 4.2-8
Summary of Modeled Maximum Health Risk Impacts by Individual Receptor

Individual Receptor Type	Health Risk Impact[1]	
	Cancer Risk	Noncancer Risk
Residential Receptors		
Maximum Exposed Individual Receptor (MEIR)	7.3	0.0086
Worker (Occupational) Receptors		
Maximum Exposed Individual Worker (MEIW)	2.4	0.0034
School Receptors		
Maximum Exposed Individual Child (MEIC)	0.18(c) , 1.3(w)	0.000054(c), 0.0019(w)
Threshold	10	1.0

[1] Cancer risk shown is total cancer risk, expressed in cases per million people, from diesel particulate matter, polycyclic aromatic hydrocarbons, and naphthalene. Cancer risk for residential receptor is based on a 70-year exposure. Cancer risk for worker receptors is based on an adjusted worker exposure in accordance with OEHHA (OEHHA 2003) and the SJVAPCD Modeling Guidance (SJVAPCD 2007x). Two cancer risk impacts were estimated for the schools. The first cancer risk shown (c) is based on a 9-year student exposure using inhalation and body weight factors developed by OEHHA for children. The second (w) cancer risk is based on a 40-year worker exposure.

See Appendix C for detailed input parameters and modeling results.

Sources: Modeling performed by ENSR 2007

Two worker locations were identified for evaluating the maximum increased individual health risk impacts at the Maximum Exposed Individual Worker (MEIW). As shown in Table 4.2-8, increased cancer risk at the MEIW, based on worker exposure assumptions, was determined to be 2.4 in one million. The HI for increased noncancer chronic risk at the MEIW was 0.0034. This worker receptor occurs north of the proposed project site along Childs Avenue.

Four schools were identified within 2.5 miles of the proposed project site, all of which are located to the west. For evaluating school receptors, two health risk analyses were conducted. The first was to evaluate the increase in potential health risk impacts to children that attend the schools using the 9-year exposure scenario available in the HARP model to estimate health risk for children. This exposure scenario accounts for the higher breathing rate to body mass ratio of a child compared to an adult and is appropriate for use in estimating exposure to children. The

second assessment treated the schools as worker receptors, similar to the analysis performed for identification of impacts at the MEIW, to account for adult staff employed at the schools.

The levels of increased cancer risk at all receptors estimated in this health risk analysis were less than the SJVAPCD significance level of 10 in one million. In addition, operation of the project would not result in HIs for noncancer chronic risk at any receptor that would exceed SJVAPCD's recommended threshold of 1.0. In summary, based on the results of this HRA, human health risks and effects from long-term operational on-site emissions associated with the proposed project would not result in the exposure of any off-site sensitive receptors to levels that exceed applicable thresholds. As a result, this is a ***less-than-significant*** impact.

Mitigation Measure

No mitigation is required.

IMPACT 4.2-5 Exposure of Sensitive Receptors to Emissions of Odors. *Construction and operation of the proposed project would not result in the frequent exposure of receptors to substantial objectionable odor emissions. As a result, this impact would be* ***less than significant.***

The project site currently consists of undeveloped and fallow farmlands and orchards with no buildings or sensitive receptors on-site. The nearest off-site sensitive receptors to the project site include the new housing development located approximately 1,250 feet west of the project site (across an existing almond orchard zoned for future industrial development), a farm house located across Gerard Avenue approximately 450 feet from the southwest corner of the project site, a farm house located over 700 feet from the project site's southeast corner, and a farm house located approximately 100 feet east of the project site (across Tower Road). The exposure of sensitive receptors to odors from project construction and operation are discussed separately below.

Short-Term Construction-Related Emissions

The predominant source of power for construction equipment is diesel engines. Exhaust odors from diesel engines, as well as emissions associated with asphalt paving and the application of architectural coatings may be considered offensive to some individuals. However, because odors would be temporary and would disperse rapidly with distance from the source, construction-generated odors would not result in the frequent exposure of off-site receptors to objectionable odor emissions.

Long-Term Operation-Related Emissions

The primary odor source from project operations would be diesel exhaust from on-site travel and idling of haul trucks and yard trucks. With the exception of trucks checking in at the truck entrance on the west side of the project site, most truck activity would occur near the center of the project site. The truck gate area would be located approximately 100 feet from the project site's west boundary and the closest off-site receptor would be the new housing development located across the almond orchard at a distance of approximately 1,350 feet. Because this is a substantial distance with respect to the rapid dispersion rate of diesel exhaust and because an ARB air toxic control measure limits truck idling to 5 minutes (13 CCR Chapter 10 Section 2485), on-site diesel emissions are not expected to generate odor complaints at off-site receptors.

Odor may also be generated by the charbroil grill in the employee cafeteria. During a 2-day site visit to the Wal-Mart distribution center in Apple Valley, CA odors from the charbroil grill were not observed from any location on the site, including indoor and outdoor areas near the employee cafeteria. In addition, because the employee cafeteria is located near the center of the project site in the warehouse building any noticeable odors would likely disperse to an unnoticeable level before reaching the site boundary.

Both project construction and project operations are not expected to result in the frequent exposure of off-site receptors to substantial objectionable odor emissions. As a result, this impact would be considered ***less than significant***.

Mitigation Measure

No mitigation is required.

IMPACT 4.2-6 **Generation of Emissions of Greenhouse Gases.** *Construction- and operation-related activities of the proposed project would result in a considerable net increase in emissions of CO_2 and other greenhouse gases. These levels would constitute a considerable net increase in GHG emissions. In addition, this increase would conflict with the state's AB 32 goals, which require reductions in statewide emissions levels of GHGs. As a result, this impact would be considered* ***significant.***

Construction- and operation-related emissions of CO_2 associated with implementation of the proposed project were estimated using URBEMIS 2007 Version 9.2.2 computer program (ARB 2007x), which is designed to model construction and operational emissions for land use development projects. Construction emissions were estimated based on default parameters of the URBEMIS 2007 model and SJVAPCD-recommended parameters for composition of the construction equipment fleet, ground disturbance acreage, worker trips, and material haul trips (SJVAPCD 2007x). The URBEMIS 2007 model does not account for CO_2 emissions associated with the production of concrete or other building materials used in project construction. Operation-related emissions were estimated based on the proposed land uses type and size, vehicle trip information from the traffic analysis prepared for this project (DKS Associates 2008), Section 4.11 "Traffic and Transportation," truck trip information from an existing Wal-Mart distribution centers in California (McAlexander, pers. comm., 2007), electricity and natural gas consumption from the Wal-Mart distribution center in Porterville, CA (Gordon, pers. comm., 2007), and SJVAPCD's recommended standard changes to URBEMIS Default Values (SJVAPCD 2007x). In addition, emissions from on-site activity by on-road haul trucks and off-road yard trucks were estimated separately using assumptions about on-site travel distances and idling times, and indirect-source GHG emissions were estimated using the California Climate Action Registry Protocol , Version 2.2 (CCAR 2007) and electricity consumption data for the existing Wal-Mart distribution center in Porterville, CA (Gordon, pers. comm., 2007). Modeled construction and operational emissions of CO_2 are summarized in Tables 4.2-9 and 4.2-10, respectively.

Table 4.2-9
Summary of Modeled Project-Generated Construction-Related Emissions of Carbon Dioxide

Source	Carbon Dioxide Emissions (Tons/Year) [1]
Grading	
Fugitive Dust	0.0
Off-Road Diesel Exhaust	984.9
On-Road Diesel Exhaust	0.0
Worker Trips	30.6
Subtotal Unmitigated	1,015.4
Asphalt	
Off-Gas Emissions	0.00
Off-Road Diesel Exhaust	21.8
On-Road Diesel Exhaust	41.8
Worker Trips	1.6
Subtotal Unmitigated	65.2
Building Construction	
Off-Road Diesel Exhaust	1,329.8
Vendor Trips	1,722.09
Worker Trips	1,079.0
Subtotal Unmitigated	4,130.8

Table 4.2-9
Summary of Modeled Project-Generated Construction-Related Emissions of Carbon Dioxide

Source	Carbon Dioxide Emissions (Tons/Year) [1]
Architectural Coatings	
Off-Gas Emissions	0.0
Worker Trips	15.3
Subtotal Unmitigated	15.3
Total	5,226.7

Notes: See Appendix C for detailed input parameters and modeling results.

[1] Emissions generated by construction were estimated using URBEMIS 2007 Version 9.2.2 (ARB 2007x) and SJVAPCD-recommended input parameters (SJVAPCD 2007x). The URBEMIS 2007 model does not account for CO2 emissions associated with the production of concrete or other building materials used in project construction.

Source: Modeling performed by EDAW 2007

Table 4.2-10
Summary of Modeled Project-Generated Operation-Related Emissions of Carbon Dioxide

Source	Carbon Dioxide Emissions (Tons/Year)[1]
Area Source[2]	
Natural Gas[3]	344.2
Landscaping	0.0
Architectural Coatings	0.3
Mobile Source	
Employee Commute Trips	2,619.1
Outbound Delivery Truck Trips[4]	
Proposed Project[5]	24,170.7
Existing[6]	21,108.4
Net[7]	3,062.3
Inbound Receivable Truck Trips[4]	
Proposed Project[8]	37,995.2
Existing[8]	37,995.2
Net[7]	0.0
On-Site Truck Activity	
Haul Truck Idling[9]	311.3
Haul Truck Travel[9]	296.6
Yard Truck Idling[10]	578.1
Yard Truck Travel[10]	132.9
Indirect Sources	
Electricity Consumption[11]	5,363.7
Total Unmitigated[12]	**12,708.4**

[1] Emissions were modeled using the URBEMIS 2007 Version 9.2.2 computer model, based on trip generation rates obtained from the traffic analysis, and implementing SJVAPCD's Recommended Standard Changes to URBEMIS Default Values (SJVAPCD 2007x).

[2] Emissions from the periodic testing of the back-up generator and fire-water pump are not included because the amount of operation from periodic testing and maintenance would be nominal at an estimated 52 hours per year.

[3] Emissions from natural gas usage were calculated using recent natural gas usage rates at the Porterville distribution center, as provided by Wal-Mart staff (Gordon, pers. comm., 2007).

[4] According to the traffic analysis, a total of 644 truck trips would be generated by the proposed Merced Distribution Center. It is assumed that half of these truck trips would be associated with truck deliveries from the distribution center to retail stores (322 *outbound* delivery truck trips) and that the other half of trips would be associated with deliveries of goods to the distribution center (322 *inbound* receivable truck trips). The emission estimates for outbound and inbound truck trips do not account for Wal-Mart's participation in EPA's SmartWay Transport Partnership, which aims to increase energy efficiency and reduce emissions from ground freight carriers (EPA 2007).

[5] It is assumed that the average trip distance for all 322 outbound delivery truck trips would be equal to the average trip distance (in and beyond the San Joaquin Valley Air Basin) from the proposed distribution center to the 49 existing Wal-Mart stores that would be served by the Merced Distribution Center, which is 109.1 miles per trip, as provided by Wal-Mart (McAlexander, pers. comm., 2007).

[6] The trip generation rate and average trip distance (171.5 miles in and beyond the San Joaquin Valley Air Basin) for existing outbound

Table 4.2-10
Summary of Modeled Project-Generated Operation-Related Emissions of Carbon Dioxide

Source	Carbon Dioxide Emissions (Tons/Year)[1]

delivery trucks are based on existing conditions data provided by Wal-Mart for the 49 existing stores that would be supplied by the Merced Distribution Center (McAlexander, pers. comm., 2007).

[7] Net emissions are equal to emissions generated by the proposed project minus existing emissions.

[8] It is assumed that the average trip distance for all inbound receivable truck trips (in and beyond the San Joaquin Valley Air Basin), with and without the proposed project, would be equal to the average existing trip distance of 171.5 miles between the 49 existing Wal-Mart stores that would be served by the Merced Distribution Center and their existing distribution center in Red Bluff or Porterville.

[9] Emissions generated by on-site travel and idling by haul trucks were estimated separately using default emission factors derived from the EMFAC2007 Version 2.3 model (ARB 2006x).

[10] Emissions generated by on-site travel and idling by off-road yard trucks were estimated using emission factors derived from URBEMIS 2007 Version 9.2.2 (ARB 2007x).

[11] Carbon dioxide (CO_2) emissions associated with electricity consumption were estimated according to methodologies of the *California Climate Action Registry General Reporting Protocol, Version 2.2* (CCAR 2007). According to the Protocol an additional 1.03 CO_2-equivalent/year of CH_4 and 7.65 CO_2-equivalent/year of N_2O would be generated by electricity consumption.

[12] The SJVAPCD has not identified mass emissions thresholds for CO_2 emissions. This estimate total does not account for the depletion of carbon sequestration associated with the removal of the existing on-site almond orchard.

See Appendix C for detailed input parameters, calculations, and modeling results.

Source: Modeling performed by EDAW 2007

As shown in Table 4.2-8, construction of the project would generate approximately 5,226.7 tons of CO_2 during the 12-month construction period. Though the construction period is projected to last for one year, the CO_2 emissions generated during that year-long period would persist in the atmosphere for much longer periods of time, on the order of tens to hundreds of years. As shown in Table 4.2-9, operation of the project would generate annual emissions of approximately 12,595 tons of CO_2 during each year of the life of the project. There are no adopted numeric thresholds above or below which a significant increase in greenhouse gas emissions would occur. Absent this type of guidance, and given the cumulative nature of contribution of these emissions to global climate change, these levels would constitute a considerable net increase in GHG emissions. In addition, this increase could conflict with the state's AB 32 goals, which require reductions in statewide GHG emission levels. As a result, this impact would be ***significant.***

Mitigation Measure 4.2-6a: Implement Mitigation Measures 4.2-1a and 4.2-1b.

The applicant shall implement Mitigation Measures 4.2-1a and 4.2-1b, which will have the added benefit of reducing construction-related emissions of CO_2.

Mitigation Measure 4.2-6b: Ensure On-Site Yard Trucks are Maintained and Meet On-Road Truck Emissions Standards.

The applicant shall ensure that all on-site "yard trucks" have ARB-approved on-road truck engines that meet on-road truck emissions standards and are maintained in proper working condition according to manufacturer specifications.

Mitigation Measure 4.2-6c: Implement Mitigation Measures 4.2-2a, 4.2-2b, 4.2-2c, and 4.2-2d.

The applicant shall implement Mitigation Measures 4.2-2a, 4.2-2b, 4.2-2c, and 4.2-2d, which will have the added benefit of reducing project-generated, operation-related emissions of CO_2.

Mitigation Measure 4.2-6d: Implement Effective Mitigation Measures.

The following measures, as well as any other effective mitigation measures, shall be implemented by the project applicant to further reduce operation-related emissions of CO_2.

- Install solar panels in all available areas of the project site, including the roof of the warehouse building, the buffer areas surrounding the paved truck yards and employee parking lot, and covered parking areas, walkways and outdoor areas, to supply electricity for on-site use. This measure would be consistent with the Merced Vision 2015 General Plan Policy SD-3.1, which is to promote the use of solar energy technology (City of Merced 1995).

- Determine which local electricity provider, Pacific Gas and Electric Company or Merced Irrigation District, produces electricity with the lowest CO_2-equivalent output emission rate (lb/MWh) and select this provider to meet remaining electricity demand of on-site operations.

- Retain the portion of the existing almond orchard located between the proposed truck gate and future Campus Parkway. For all almond trees that are subject to removal, participate in an urban and community forestry program (such as the UrbanWood program managed by the Urban Forest Ecosystems Institute [Urban Forest Ecosystems Institute 2007]) in which tree wood is harvested for an end-use that would retain its carbon sequestration (e.g., furniture building, cabinet making). For all nonharvestable almond trees that are subject to removal, develop an off-site tree program that includes a level of tree planting that, at a minimum, increases carbon sequestration by an amount equivalent to what would have been sequestered by the almond orchard during its lifetime. This program shall be funded by the applicant and reviewed for comment by an independent Certified Arborist unaffiliated with the Applicant. Final approval of the program shall be provided by the City. Components of the program may include, but not be limited to, providing urban tree canopy in the City of Merced, or reforestation in suitable areas outside the City. Upon its completion, the California Urban Forestry Greenhouse Gas Reporting Protocol shall be used to assess this mitigation program. At the time of writing this document, the Center for Urban Forest Research expects to complete the California Urban Forestry Greenhouse Gas Reporting Protocol with the California Climate Action Registry sometime in 2008 (Center for Urban Forest Research 2007). All unused vegetation and tree material shall be shipped to the nearest composting facility, or landfill that is equipped with a methane collection system, or biomass power plant. Tree and vegetative material should not be burned on or off-site unless used as fuel in a biomass power plant.

- The applicant shall inventory all emissions of GHGs associated with operation of the project according to the most recently established methodologies of the CCAR or ARB. This inventory shall include mobile-source GHG emissions associated with trips by Wal-mart trucks traveling to and from the distribution center, and on-site vehicles that are part of Wal-mart's vehicle fleet. At the time of writing this report the most recently established methodology is the California Climate Action Registry's General Reporting Protocol, Version 2.2 (CCAR 2007).

Implementation of the Mitigation Measures 4.2-6a through 4.2-6d above would result in reductions of emissions of CO_2 and offsets; however, at the time of writing this EIR these reductions cannot be fully quantified. In addition, implementation of Mitigation Measure 4.2-1c and Mitigation Measure 4.2-2e, which require the Applicant to implement an emissions reduction agreement with SJVAPCD to reduce construction and operational emissions of ROG and NO_X to less than the SJVAPCD-established threshold for ROG and NO_X 10 TYP, will have the added benefit of reducing construction and operational GHG emissions. However, the size of the associated GHG reduction cannot be quantified at the time of writing this EIR and, more significantly, there is not established methodology for verifying the associated GHG reductions from emission reduction agreements. Moreover, the net increase in GHG emissions would may still be of an amount that would be considered substantial. Because the project would potentially still result in a net increase in CO_2 emission levels and conflict with the state's AB 32 goals, this impact would be remain ***significant and unavoidable***.