4.3 AIR QUALITY

The information presented in this section is based on documents prepared by the Sacramento Metropolitan Air Pollution Control District (APCD), U.S. Environmental Protection Agency (EPA), California Air Resources Board (ARB), and National Oceanic and Atmospheric Administration (NOAA). These documents provide background information used in preparation of the existing conditions discussion and impact analysis included in this section.

4.3.1 EXISTING CONDITIONS

CLIMATE AND METEOROLOGY

Zone 40 is located in Sacramento County, in the Sacramento Valley Air Basin (SVAB), which is under the jurisdiction of the Sacramento Metropolitan Air Quality Management District (SMAQMD). Sacramento County is located at the southern end of the Sacramento Valley, which is bounded by the Coast and Diablo ranges on the west and the Sierra Nevada on the east. The county is 55 miles northeast of the Carquinez Strait, a sea-level gap between the Coast Ranges and the Diablo Range. The intervening terrain of the valley is flat. The prevailing wind direction is from the south, resulting in marine breezes through the Carquinez Strait. During winter, the sea breezes diminish and winds from the north occur more frequently.

During spring, summer, and early fall, a layer of warm air often overlays a layer of cool air from the Delta and San Francisco Bay, resulting in an inversion. Typical winter inversions are formed when the sun heats the upper layers of air, trapping air that has been cooled by contact with the colder surface of the earth during nighttime hours. Although each inversion layer predominates at certain times of the year, both types can occur at any time of the year. Local topography produces many variations that can affect the inversion base and thus influence local air quality (SMAQMD 1994).

The Sacramento Valley has hot, dry summers and cool, rainy winters. Summer temperatures range from an average nighttime low of 55°F to an average daytime high of 98°F, with temperatures in excess of 100°F common. Winter temperatures range from an average nighttime low of 37°F to an average daytime high of 61°F, with occasional overnight freezing temperatures. Annual precipitation averages 17 inches, with 88% of the rainfall occurring from November through April.

REGULATORY SETTING

Air quality in the Zone 40 area is regulated by several jurisdictions, including EPA, ARB, and SMAQMD. These jurisdictions develop rules, regulations, policies, and plans to achieve the goals and directives imposed through legislation. State and local rules, regulations, and policies do not supercede federal regulations, but they can be more stringent.

National and State Ambient Air Quality Standards

EPA has established primary and secondary National Ambient Air Quality Standards (NAAQS) for carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), respirable particulate matter (PM_{10}), fine particulate matter, and lead, which are referred to as criteria air pollutants. Primary standards protect public health, whereas secondary standards protect public welfare. ARB has established California Ambient Air Quality Standards (CAAQS) for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particulates, in addition to the criteria air pollutants identified above. In most cases, CAAQS are more stringent than NAAQS. The National and California Ambient Air Quality Standards are listed in Table 4.3-1.

Sacramento Metropolitan Air Quality Management District

The SMAQMD is the agency primarily responsible for ensuring that National and State Ambient Air Quality Standards are not exceeded and that air quality conditions are maintained in the SVAB. Responsibilities of the SMAQMD include preparing plans for attaining ambient air quality standards, adopting and enforcing rules and regulations concerning sources of air pollution, issuing permits for stationary sources of air pollution, inspecting stationary sources of air pollution and responding to citizen complaints, monitoring ambient air quality and meteorological conditions, and implementing programs and regulations required by the federal Clean Air Act and the California Clean Air Act. In an attempt to achieve National and State Ambient Air Quality Standards and maintain air quality, the SMAQMD has completed the Sacramento 1991 Air Quality Attainment Plan (AQAP) as well as the 1994 Sacramento Regional Clean Air Plan (SMAQMD 1991).

POLLUTANTS

Criteria Air Pollutants

The ARB and EPA focus on "criteria pollutants," including ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, and particulate matter, as indicators of air quality. A brief description, including information on adverse health effects and formation processes, of each criteria air pollutant is provided in Appendix C.

Ambient Air Quality

Air pollutant concentrations are measured at several monitoring stations in Sacramento County. The Elk Grove-Bruceville Road and Sacramento-T Street air quality monitoring stations record sufficient data to meet EPA and/or ARB criteria for quality assurance. In general, ambient air quality measurements from these stations are representative of the air quality in Zone 40.

Table 4.3-2 summarizes the air quality data from 1998 to 2001 for the monitoring stations identified above. The state (1-hour) and national (1-hour/8-hour) ozone standards were exceeded several times at both air monitoring stations in the past 4 years. The suspended (PM_{10}) national standard (24-hour average, 150 micrograms per cubic meter [$\mu g/m^3$]) was not

exceeded; however, the state standard (24-hour average, 50 µg/m^3) was exceeded. With respect to CO and NO_2, neither the state nor the national standards were exceeded from 1998 to 2001.

Table 4.3-1
Ambient Air Quality Standards

	California [1]	National [2]	
Air Pollutant	Concentration [3]	Primary (>) [3,4]	Secondary (>) [3,5]
Ozone	0.09 ppm, 1-hr avg	0.12 ppm, 1-hr avg 0.08 ppm, 8-hr avg [3]	0.12 ppm, 1-hr avg 0.08 ppm, 8-hr avg[3]
Carbon monoxide	9 ppm, 8-hr avg 20 ppm, 1-hr avg	9 ppm, 8-hr avg 35 ppm, 1-hr avg	9 ppm, 8-hr avg 35 ppm, 1-hr avg
Nitrogen dioxide	0.25 ppm, 1-hr avg	100 µg/m^3 annual	100 µg/m^3 annual
Sulfur dioxide	0.04 ppm, 24-hr avg 0.25 ppm, 1-hr avg	0.03 ppm, annual average 0.14 ppm, 24-hr avg	0.5 ppm, 3-hr avg
Respirable particulate matter (PM_{10})	30 µg/m^3 annual geometric mean 50 µg/m^3, 24-hr avg	50 µg/m^3 annual arithmetic mean 150 µg/m^3, 24-hr avg	50 µg/m^3 annual arithmetic mean 150 µg/m^3, 24-hr avg
Fine particulate matter ($PM_{2.5}$)	--	15 µg/m^3 annual arithmetic mean 65 µg/m^3, 24-hr avg	15 µg/m^3 annual arithmetic mean 65 µg/m^3, 24-hr avg
Lead	1.5 µg/m^3, 30-day average	1.5 µg/m^3 calendar quarter	1.5 µg/m^3 calendar quarter
Sulfates	25 µg/m^3, 24-hr avg	--	--
Hydrogen sulfide	0.03 ppm, 1-hr avg	--	--
Vinyl chloride	0.01 ppm, 24-hr avg	--	--
Visibility-reducing particles	Insufficient amount to produce an extinction coefficient of 0.23 per kilometer-visibility of 10 miles or more (0.07 to 30 miles or more for Lake Tahoe) because of particles when the relative humidity is less than 70%	--	--

[1] California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter (PM_{10}), 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.

[2] National standards (other than those for ozone and suspended particulate matter [PM_{10}] and those based on annual averages or annual arithmetic means) are not to be exceeded more than once per 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. For PM_{10}, the 24-hour standard is attained when 99% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. For $PM_{2.5}$, the 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard.

[3] The concentration is expressed in units in which it was promulgated where ppm = parts per million by volume and µg/m^3 = micrograms per cubic meter.

[4] National primary standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

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

Source: ARB Air Quality Data 1995-1997

Table 4.3-2
Summary of Annual Air Quality Data

	1998	1999	2000	2001
Ozone (O_3)				
Elk Grove-Bruceville Road Air Quality Monitoring Station				
State standard (1-hr avg, 0.09 ppm)				
National standard (1-hr/8-hr avg, 0.12/0.08 ppm)				
Maximum concentration (1-hr/8-hr average)	0.14/0.11	0.16/0.10	0.10/0.09	.11/0.09
Number of days state standard exceeded	7	16	3	10
Number of days national 1-hr/8-hr standard exceeded	1/4	1/7	0/1	0/3
Sacramento - T Street Air Quality Monitoring Station				
State standard (1-hr average, 0.09 ppm)				
National standard (1-hr/8-hr avg, 0.12/0.08 ppm)				
Maximum concentration (1-hr/8-hr avg)	0.14/0.09	0.12/0.09	0.10/0.08	0.11/0.09
Number of days state standard exceeded	8	6	3	2
Number of days national 1-hr/8-hr standard exceeded	1/4	0/4	0/0	0/3
Carbon Monoxide (CO)				
Sacramento - T Street Air Quality Monitoring Station				
State standard (1-hr/8-hr average, 20/9.1 ppm)				
National standard (1-hr/8-hr avg, 35/9.5 ppm)				
Maximum concentration (1-hr/8-hr average)	7.9/7.1	7.5/5.7	5.9/4.4	6.7/4.3
Number of days state standard exceeded	0	0	0	0
Number of days national 1-hr/8-hr standard exceeded	0/0	0/0	0/0	0/0
Nitrogen Dioxide (NO_2)				
Elk Grove-Bruceville Road Air Quality Monitoring Station				
State standard (1-hr average, 0.25 ppm)				
National standard (annual, 100 µg/m3)				
Maximum concentration (1-hr average)	0.048	0.081	0.051	0.063
Number of days state standard exceeded	0	0	0	0
Annual average (ppm)	0.009	0.011	0.010	0.009
Sacramento - T Street Air Quality Monitoring Station				
State standard (1-hr average, 0.25 ppm)				
National standard (annual, 100 µg/m^3)				
Maximum concentration (1-hr average)	0.075	0.099	0.084	0.067
Number of days state standard exceeded	0	0	0	0
Annual average (ppm)	0.021	0.021	0.019	N/A
Suspended Particulate Matter (PM_{10})				
Sacramento-T Street Air Quality Monitoring Station				
State standard (24-hr average, 50 µg/m^3)				
National standard (24-hr average, 150 µg/m^3)				
Maximum concentration	75	99	64	89
Number of days state standard exceeded	3	8	5	5
Number of days federal standard exceeded	0	0	0	0

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

Sources: ARB 2002, EPA 2002

Attainment Status

Under the California Clean Air Act, the ARB is required to designate areas of the state as attainment, nonattainment, or unclassified with respect to applicable standards. An "attainment" designation for an area signifies that pollutant concentrations did not violate the applicable standard in that area. A "nonattainment" designation indicates that a pollutant concentration violated the applicable standard at least once, excluding those occasions when a violation was caused by an exceptional event, as defined in the criteria. An "unclassified" designation signifies that the data do not support either an attainment or a nonattainment status. The California Clean Air Act divides districts into moderate, serious, and severe air pollution categories, with increasingly stringent control requirements mandated for each category.

Federal and state classifications for nonattainment areas are typically based on "design values" (maximum concentrations recorded at a monitoring station over a given period) and/or the region's ability to reach attainment within the timeframes established for each designation. For instance, under the federal classification system, areas designated "severe" nonattainment (i.e., design value of 0.180 to 0.191 part per million [ppm]) have until November 15, 2005, to attain the federal 1-hour ozone standard, whereas areas designated "extreme" nonattainment (i.e., design value of 0.280 ppm and greater) must reach attainment by November 15, 2010. State ozone classifications are similar to federal classifications but are based solely on design values. Federal and state nonattainment classification systems have not been established for all criteria pollutants.

The national and state attainment status designations pertaining to the SVAB are presented in Table 4.3-3. The SVAB is currently designated as a severe/nonattainment area for the national and state ozone (1-hour) standards and serious nonattainment for the state PM_{10} standard.

Table 4.3-3
Attainment Status Designations - Sacramento Valley Air Basin

Pollutant	National Designation	State Designation
Ozone (1-hour)	Nonattainment/severe	Nonattainment/severe
Ozone (8-hour)	Designation to be determined	No state standard
PM_{10}	Nonattainment/serious	Nonattainment
$PM_{2.5}$	Designation to be determined	No state standard
CO	Unclassified/attainment	Attainment
Nitrogen dioxide	Unclassified/attainment	Attainment
Sulfur Dioxide	Attainment	Attainment
Lead (particulate)	No designation	Attainment
Hydrogen sulfide	No federal standard	Unclassified
Sulfates	No federal standard	Attainment
Visibility-reducing particulates	No federal standard	Unclassified
Source: SMAQMD 2002		

4.3.2 ENVIRONMENTAL IMPACTS

THRESHOLDS OF SIGNIFICANCE

Sacramento Metropolitan Air Quality Management District

On March 28, 2002, the Board of Directors of the SMAQMD approved the following revised significance criteria thresholds for pollutants emitted to air. Implementation of the 2002 Zone 40 WSMP would result in potentially significant air quality impacts if the following thresholds were exceeded:

- short-term effects (construction): NO_X emissions of 85 pounds per day (ppd),
- long-term effects (operational): NO_X and ROG emissions of 65 ppd (each), or
- particulate matter (PM_{10}): 275 ppd.

In addition to the above criteria, the State CEQA Guidelines state that air quality impacts would be significant if implementation of the 2002 Zone 40 WSMP would:

- cause or contribute substantially to an existing or projected violation of state or federal ambient air quality standards or
- expose sensitive receptors to substantial pollutant concentrations or odors.

IMPACT ANALYSIS

Impact 4.3-1: Short-Term Construction-Related Emissions. Short-term construction-generated emissions could potentially exceed SMAQMD daily emission thresholds of 85 ppd for NO_X and 275 ppd for fugitive dust (PM_{10}). As a result, short-term construction-generated air quality impacts would be potentially significant.

Emissions produced during construction would vary daily depending on the type of activity. In general, construction activities likely associated with the implementation of the 2002 Zone 40 WSMP would include site clearing, excavation and grading, utility construction, and building construction. At this time, the specific locations and types of equipment that would be used to construct project facilities are not known. Construction activities would normally involve the use of bulldozers, scrapers, backhoes, and trucks during excavation and grading; backhoes and paving equipment during utility construction; and pile drivers, concrete mixers and pumps, saws, hammers, cranes and forklifts during building construction.

The operation of heavy equipment during construction would generate fugitive dust and vehicle exhaust emissions. Vehicle exhaust emissions also would be generated by construction employees traveling to and from the construction site. Depending on the specific equipment required and activities performed, short-term construction-generated emissions could potentially exceed the SMAQMD daily emission thresholds of 85 ppd for NO_X and 275 ppd for

emissions of fugitive dust (PM_{10}). As a result, short-term construction-generated air quality impacts would be potentially significant.

Impact 4.3-2: Long-Term Operational Source Emissions. Project-generated emissions of ROG, NO_X, and PM_{10} associated with mobile source and fugitive dust emissions are anticipated to be less than AQMD thresholds. Therefore, this would be a less-than-significant impact.

Reactive organic gases (ROG), oxides of nitrogen (NO_X), and PM_{10} are the regional pollutants of primary concern in the SVAB**.** Operational emissions of ROG and NO_X would be associated with increases in mobile source emissions related to routine maintenance activities and employees commuting to and from the proposed facility sites. Increased energy demand associated with the operation of the proposed facilities also would result in minor increases in regional emissions. The operational emissions associated with the proposed water treatment plant scenarios, groundwater injection wells, and the groundwater treatment facilities are discussed below.

Mobile Source Emissions

Based on estimates from operation of similar facilities, the proposed water treatment plant and water diversion structure would require 10-20 full-time employees. Assuming an average of two one-way trips per employee per day, operation of the plant would result in 40 trips per day. Routine maintenance and inspection activities, including the delivery of equipment and supplies to the diversion structure and treatment plant, would result in 20–24 one-way trips per day. Assuming an average trip length of 10 miles, the proposed facilities would result in increased mobile source emissions of 1.2 pounds per day of ROG and 1.3 pounds per day of NO_X.

Stationary Source Emissions and Increased Energy Demand

Operation of the proposed facilities would require the use of various electricity-powered pumps and motors, which would result in indirect emissions of criteria pollutants associated with the generation of electricity. Because electrical generating facilities for Sacramento County are located either outside the county or are offset through pollution credits, electricity-generated pollution is discounted by the SMAQMD.

In the case of a power outage, backup emergency-use generators may be required. Backup generators likely would be located at the proposed water treatment and groundwater extraction facilities. Operation of the backup diesel generators would occur on an intermittent, as-needed basis and would be subject to regulations and permitting requirements for the operation of stationary emission sources. Because power generators would be used on an intermittent, as-needed basis, emissions from such sources are anticipated to have only a minor contribution to total project-related operational emissions.

Total Operational Emissions

As discussed above, increases in regional pollutants associated with the operation of the proposed facilities would be primarily the result of increased vehicle use associated with employees commuting to and from the proposed facilities, as well as maintenance, inspection, and delivery trips. Mobile source emissions have been estimated at less than 0.16 pound per day of ROG and 1 pound per day of NO_X. Additional emissions from stationary sources at the water treatment plant also would occur. However, it is anticipated that emissions from these sources would result in only minor contributions to total project-generated emissions. Therefore, total operational emissions of ROG and NO_X would not be expected to exceed the SMAQMD's threshold of 65 ppd. This operational air quality impact would be less than significant.

Impact 4.3-3: Increases in Toxic Air Contaminants. Water treatment facilities and operations have not been sufficiently defined at this time to accurately assess related impacts associated with the generation of toxic air contaminants. However, any water quality treatment facilities that would emit toxic air contaminants would require permitting from the SMAQMD. Compliance with thee permitting requirements would ensure that emissions of toxic air contaminant would be less than significant.

The toxics-generation potential of the proposed treatment facility would be largely dependent on the treatment process selected. In particular, chlorination and ozonation processes could result in the generation of toxic chemical byproducts that could be released into the atmosphere. Project facilities, operations, and site locations have not been sufficiently defined at this time to accurately assess related impacts associated with the generation of toxic air contaminants. However, any water quality treatment facilities that would emit toxic air contaminants would require permitting from the SMAQMD. Compliance with SMAQMD permitting requirements would ensure that emissions of toxic air contaminants would be less than significant.

4.3.3 ENVIRONMENTAL MITIGATION GUIDELINES

No environmental mitigation guidelines are necessary for the following less-than-significant impacts.

4.3-2: Long-Term Operational Source Emissions

4.3-3: Increases in Toxic Air Contaminants

Environmental mitigation guidelines are recommended for the following potentially significant impact.

4.3-1: Short-Term Construction-Related Emissions. Develop an air quality mitigation plan consistent with Sacramento Metropolitan Air Quality Management District protocols to reduce

construction-generated emissions. Such a plan is expected to include measures to control fugitive dust, such as the following construction-related environmental mitigation guidelines:

- All disturbed areas, including storage piles that are not actively used for construction purposes, shall be stabilized of dust emissions using water, chemical stabilizer/suppressant, or vegetative ground cover.
- All onsite unpaved roads and offsite unpaved access roads shall be stabilized of dust emissions using water or chemical stabilizer/suppressant.
- All ground-disturbing activities (e.g., clearing, grubbing, scraping, and excavation) shall be controlled of fugitive dust emissions using application of water or by presoaking.
- All material shall be transported offsite and covered and wetted to limit visible dust emissions, or at least 6 inches of freeboard space from the top of the container shall be maintained.
- Wheel washers shall be installed for all exiting trucks and equipment, or wheels shall be washed to remove accumulated dirt before leaving construction sites.
- All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at least once every 24 hours during operations.
- Following the addition of materials to, or the removal of materials from, the surfaces of outdoor storage piles, the piles shall be stabilized of fugitive dust emissions using water or chemical stabilizer/suppressant.
- Vehicle speeds on unpaved surfaces shall be limited to 15 mph.
- Excavation and grading activities shall be suspended when winds exceed 20 mph.
- Areas subject to excavation and grading at any one time shall be limited to the fullest extent possible.

The air quality mitigation plan will include measures to reduce short-term emissions of diesel exhaust particulate matter, such as the following:

- Truck and equipment engines shall be maintained in good running condition, in accordance with manufacturer specifications.
- When not in use, equipment shall not be left idling.
- The project contractor(s) or designated representatives, shall provide a plan for approval by SCWA and SMAQMD demonstrating that the heavy-duty (> 50 horsepower) off-road vehicles to be used in construction activities, including owned, leased, and subcontractor vehicles, will achieve a projectwide fleet-average 20% NO_X reduction and 45% particulate

reduction compared to the most recent ARB fleet average at time of construction. Acceptable options for reducing emissions may include use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, and/or other options as they become available.

- The project contractor(s) or designated representatives shall submit to SMAQMD a comprehensive inventory of all off-road construction equipment, equal to or greater than 50 horsepower, that will be used an aggregate of 40 or more hours during any portion of the construction project. The inventory shall include the horsepower rating, engine production year, and projected hours of use or fuel throughput for each piece of equipment. The inventory shall be updated and submitted monthly throughout the duration of the project, except that an inventory shall not be required for any 30-day period in which no construction activity occurs. At least 48 hours before the use of subject heavy-duty off-road equipment, the project representative shall provide SMAQMD with the anticipated construction timeline including start date, and name and phone number of the project manager and onsite foreman.

- Implementing the 2002 Zone 40 WSMP shall ensure that emissions from all off-road diesel powered equipment used on the project site do not exceed 40% opacity for more than 3 minutes in any one hour. Any equipment found to exceed 40% opacity (or Ringelmann 2.0) shall be repaired immediately, and SMAQMD shall be notified within 48 hours of identification of noncompliant equipment. A visual survey of all in-operation equipment shall be made at least weekly, and a monthly summary of the visual survey results shall be submitted throughout the duration of the project, except that the monthly summary shall not be required for any 30-day period in which no construction activity occurs. The monthly summary shall include the quantity and type of vehicles surveyed as well as the dates of each survey.

4.3.4 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Adherence to the above environmental mitigation guidelines would reduce the project's air quality impacts to a less-than-significant level.