SECTION 5.9 AIR QUALITY

This section includes a summary of applicable regulations, existing air quality conditions, and an analysis of potential short-term and long-term air quality impacts of the Feather River Levee Repair Project (FRLRP). The method of analysis for short-term construction-related, long-term regional (operational), local mobile-source, odorous, and toxic air emissions is consistent with the recommendations of the Feather River Air Quality Management District (FRAQMD). In addition, mitigation measures are recommended as necessary to reduce significant air quality impacts.

5.9.1 REGULATORY SETTING

The project site is in Yuba County, which is in the Northern Sacramento Valley Air Basin (NSVAB). The NSVAB consists of Butte, Colusa, Glenn, Shasta, Sutter, Tehama, and Yuba Counties. Air quality in Yuba County is regulated by the U.S. Environmental Protection Agency (EPA), California Air Resources Board (ARB), and FRAQMD. Although EPA regulations may not be superseded, both state and local regulations may be more stringent. The following air quality regulations focus primarily on ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM), and lead. Because these are the most prevalent air pollutants known to be deleterious to human health and extensive health-effects criteria documents are available, these pollutants are commonly referred to as “criteria air pollutants.”

FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

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 5.9-1, “Ambient Air Quality Standards and Attainment Designations,” EPA has established primary and secondary NAAQS for the following criteria air pollutants: ozone, respirable particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), CO, NO_2, SO_2, 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 modified periodically to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. EPA reviews all state SIPs to determine conformation to the mandates of the CAA and its amendments and to determine whether implementation will achieve air quality goals. If EPA determines that a SIP is inadequate, a Federal Implementation Plan (FIP) that imposes additional control measures may be prepared for the nonattainment area. Failure to submit an approvable SIP or to implement the plan within the mandated time frame may result in application of sanctions to transportation funding and stationary air pollution sources in the air basin.

Table 5.9-1
Ambient Air Quality Standards and Attainment Designations

Pollutant	Averaging Time	California Standards		National Standards [a]		
		Standards [b,c]	Attainment Status [d]	Primary [c,e]	Secondary [c,f]	Attainment Status [g]
Ozone	1-hour	0.09 ppm (180 μg/m^3)	N (Moderate)	– [h]	Same as Primary Standard	– [h]
	8-hour	0.07 ppm (137 μg/m^3)	U	0.08 ppm (157 μg/m^3)		U/A
Respirable Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 μg/m^3	N	50 μg/m^3 [f]	Same as Primary Standard	U
	24-hour	50 μg/m^3		150 μg/m^3		
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 μg/m^3	U	15 μg/m^3	Same as Primary Standard	–
	24-hour	–	–	65 μg/m^3		
Carbon Monoxide (CO)	1-hour	20 ppm (23 mg/m^3)	U	35 ppm (40 mg/m^3)	–	U
	8-hour	9 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)		
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	–	–	0.053 ppm (100 μg/m^3)	Same as Primary Standard	U/A
	1-hour	0.25 ppm (470 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	–	–	–
Lead [i]	30-day Average	1.5 μg/m^3	A	–	–	–
	Calendar Quarter	–	–	1.5 μg/m^3	Same as Primary Standard	

Table 5.9-1
Ambient Air Quality Standards and Attainment Designations

Pollutant	Averaging Time	California Standards		National Standards [a]		
		Standards [b,c]	Attainment Status [d]	Primary [c,e]	Secondary [c,f]	Attainment Status [g]
Sulfates	24-hour	25 µg/m³	A	No National Standards		
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m³)	U			
Vinyl Chloride [i]	24-hour	0.01 ppm (26 µg/m³)	U/A			
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			

Notes: µg/m³ = micrograms per cubic meter; mg/m³ = milligrams per cubic meter; ppm = parts per million

[a] 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.

[b] 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. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[c] Concentration expressed first in units in which it was promulgated [i.e., parts per million (ppm) or micrograms per cubic meter (µg/m³)]. Equivalent units given in parentheses are based upon a reference temperature of 25 degrees Celsius (°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.

[d] 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 at least one violation of a state standard for that pollutant in the area.

Nonattainment/Transitional (NT): 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.

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

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

[g] 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.

[h] The national 1-hour ozone standard was revoked on June 15, 2005.

[i] 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.

Sources: California Air Resources Board 2006a; U.S. Environmental Protection Agency 2006a, 2006b

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

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 5.9-1). 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 overseeing local air district compliance with California and federal laws; approving local air quality attainment plans (AQAPs); 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.

LOCAL PLANS, POLICIES, REGULATIONS, AND LAWS

FRAQMD attains and maintains air quality conditions in Yuba and Sutter Counties through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean-air strategy of FRAQMD 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. FRAQMD 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 CCAA.

In an attempt to achieve the NAAQS and CAAQS and maintain healthful air quality throughout the NSVAB, FRAQMD and the other air districts in the NSVAB have jointly prepared and adopted AQAPs and reports. The most recent AQAP, completed in 2003, addresses all of the following:

- air quality modeling to identify the reductions needed and design effective emissions reduction strategies,
- comprehensive emission reduction programs that take advantage of zero- and near-zero-emission technologies, and
- the impacts of pollutant transport in the attainment demonstration.

In 1998 FRAQMD published the *Indirect Source Review Guidelines* (Feather River Air Quality Management District 1998). More recently FRAQMD has provided California Environmental Quality Act (CEQA) planning guidance online (Feather River Air Quality Management District 2006) to assist with identification of significant adverse air quality impacts and suggest amenities that will reduce potential project emissions early in the planning process. Because stationary sources such as industrial facilities are largely regulated, the guidelines focus on transportation and land-use control measures to reduce emissions to achieve and maintain federal and state health-based air quality standards.

All projects are subject to FRAQMD rules and regulations in effect at the time of construction. Specific rules applicable to the construction of the proposed project may include the following:

- Rule 3.0—Visible Emissions. A person shall not discharge into the atmosphere from any single source of emission whatsoever any air contaminant for a period or periods aggregating more than 3 minutes in any 1 hour which is as dark or darker in shade as that designated as No. 2 on the Ringelmann Chart, as published by the United States Bureau of Mines.

- Rule 3.2—Particulate Matter Concentration. A person shall not discharge into the atmosphere from any source particulate matter in excess of 0.3 grains per cubic foot of gas at standard conditions.

- Rule 3.15—Architectural Coatings. No person shall: (i) manufacture, blend, or repackage for sale within the District [FRAQMD]; (ii) supply, sell, or offer for sale within FRAQMD; or (iii) solicit for application or apply within FRAQMD, any architectural coating with VOC [volatile organic carbon] content in excess of the corresponding specified manufacturer's maximum recommendation.

- Rule 3.16—Fugitive Dust Emissions. A person shall take every reasonable precaution not to cause or allow the emissions of fugitive dust from being airborne beyond the property line, from which the emission originates, from any construction, handling or storage activity, or any wrecking, excavation, grading, clearing of land or solid waste disposal operation.

- Rule 4.1—Permit Requirements. Any person operating an article, machine, equipment, or other contrivance, the use of which may cause, eliminate, reduce, or control the issuance of air contaminants, shall first obtain a written permit from the Air Pollution Control Officer (APCO). Stationary sources subject to the requirements of Rule 10.3, Federal Operating Permit Program, must also obtain a Title V permit pursuant to the requirements and procedures of that rule.

TOXIC AIR CONTAMINANTS

Air quality regulations also focus on toxic air contaminants (TACs), or in federal parlance, hazardous air pollutants (HAPs). A TAC is defined as an air pollutant that may cause or contribute to an increase in levels of mortality or 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. 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 5.9-1). 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 statutes and regulations, in conjunction with additional rules set forth by FRAQMD, 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 for major sources of HAPs may differ from the standards for area sources. 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 promulgate vehicle or fuel standards containing reasonable requirements that control toxic emissions, at a minimum emissions of 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 of the CAAA 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

The State of California regulates TACs primarily through the Tanner Air Toxics Act (Assembly Bill [AB] 1807 [1983]) and the Air Toxics Hot Spots Information and Assessment Act (AB 2588 [1987]). The Tanner Act sets forth a formal procedure for ARB to designate substances as TACs. Research, public participation, and scientific peer review must occur before ARB can designate a substance as a TAC. To date, ARB has identified more than 21 TACs and has 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 adopts an Airborne Toxics Control Measure (ATCM) 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.

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:

- more stringent emission standards for some new urban bus engines, beginning with 2002 model year engines;
- zero-emission bus demonstration and purchase requirements applicable to transit agencies; and
- 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 fewer 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 emissions of formaldehyde 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 recently published *Air Quality and Land Use Handbook: A Community Health Perspective* (California Air Resources Board 2005), which provides guidance concerning land use compatibility with sources of TAC emissions. While not a law or adopted policy, the handbook offers 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 FRAQMD Regulation 4.0 ("General Requirements"), Regulation 4.1 ("Permits Required"), Regulation 10.1 ("New Source Review"), and Regulation 10.3 ("Federal Operating Permits"), all sources that possess the potential to emit TACs are required to obtain permits from FRAQMD. 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. FRAQMD limits emissions and public exposure to TACs through a number of programs. FRAQMD 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 FRAQMD (e.g., in a health risk assessment) based on their potential to emit toxics. If it is determined that the project would emit toxics in excess of FRAQMD's threshold of significance for TACs, as identified below, sources must 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, FRAQMD 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.

5.9.2 ENVIRONMENTAL SETTING

SOURCES OF INFORMATION

The information in this section is based primarily on review of the following documents:

- FRAQMD's *Indirect Source Review Guidelines* (Feather River Air Quality Management District 1998),
- FRAQMD CEQA planning information (Feather River Air Quality Management District 2006),
- *Draft Environmental Impact Report for the Yuba-Feather Supplemental Flood Control Project* (Yuba County Water Agency 2003), and
- *Draft Environmental Impact Report for the Feather-Bear Rivers Levee Setback Project* (Three Rivers Levee Improvement Authority 2004).

FACTORS AFFECTING POLLUTANT CONCENTRATIONS

The ambient concentrations of air pollutant emissions are determined by the amount of emissions released by pollutant sources and the ability of the atmosphere to transport and dilute such emissions. Natural factors that affect transport and dilution include terrain, wind, atmospheric stability, and the presence of sunlight. Therefore, existing air quality conditions in the project 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

The dimensions of the NSVAB are approximately 216 miles north to south and 95 miles east to west at the widest part. The NSVAB is bounded on the west and north by the Coast Range and on the east by the southern portion of the Cascade Range and the northern portion of the Sierra Nevada. The surrounding mountain ranges reach heights of 3,500 feet in the southwest, 8,500 feet in the northwest, 1,700 feet in the southeast, and 10,500 feet in the northeast. These mountain ranges provide a substantial physical barrier to locally created pollution as well as that transported northward on prevailing winds from the Sacramento metropolitan area.

Meteorology and Climate

The annual temperature, humidity, precipitation, and wind patterns of the NSVAB reflect the regional topography and the strength and location of a semipermanent, subtropical high-pressure cell. Summer temperatures that often exceed 100 degrees Fahrenheit (°F) coupled with clear sky conditions are favorable for ozone formation. Most precipitation in the valley occurs during winter storms. The coastal mountain ranges induce winter storms from the Pacific Ocean to release precipitation on the western slopes, producing a partial rain shadow over the valley. The winds and unstable atmospheric conditions associated with the passage of winter storms result in periods of low air pollution and excellent visibility. However, between winter storms, high pressure and light winds lead to the creation of low-level temperature inversions and stable atmospheric conditions that can result in high concentrations of CO and particulate matter (PM).

Summer conditions in the NSVAB are typically characterized by high temperatures and low humidity, with prevailing winds from the south. Summer temperatures average approximately 90°F during the day and 50°F at night (Feather River Air Quality Management District 1998).

Winter conditions in the NSVAB are characterized by occasional rainstorms interspersed with stagnant and foggy weather. Winter temperatures average in the low 50s (°F), and nighttime temperatures average in the upper 30s. Rainfall occurs mainly from late October to early May, averaging 17.2 inches per year, but varies significantly from year to year. During winter, north winds are frequent, but winds from the south predominate (Feather River Air Quality Management District 1998). The predominant wind direction and speed is from the south at 8.0 miles per hour (mph) (California Air Resources Board 1994).

Atmospheric Stability and Inversions

Stability describes the resistance of the atmosphere to vertical motion. The stability of the atmosphere depends on the vertical distribution of temperature. When the temperature decreases vertically at 10 degrees Celsius (°C) per 1,000 meters, the atmosphere is considered “neutral.” When the change in temperature is greater than 10°C per 1,000 meters, the atmosphere is considered “unstable.” When the change is less than 10°C per 1,000 meters, the atmosphere is termed “stable.” In the NSVAB, categories range from extremely unstable conditions, which are present in spring and summer, through neutral to stable conditions, which are both present in fall and winter. Unstable conditions occur primarily during the daytime, when solar heating warms the lower atmospheric layers sufficiently. Under extremely unstable conditions, large fluctuations in horizontal wind direction are coupled with large mixing depths, which are the vertical depths available for diluting air pollution near the ground. As solar heating decreases, fluctuations in wind direction and the vertical mixing depth become less pronounced, resulting in neutral to stable conditions. Under the most stable conditions, which are present in the NSVAB in fall and winter, air pollution emitted into the atmosphere will travel downwind with poor dispersion. The dispersive power of the atmosphere decreases with progression through the categories from extremely unstable to stable.

An inversion is a layer of warmer air over a layer of cooler air. Inversions influence the mixing depth of the atmosphere, thus significantly affecting air quality conditions. The NSVAB experiences two types of inversions that affect air quality. The first type of inversion layer contributes to photochemical smog problems by confining pollution to a shallow layer near the ground. This type occurs in summer, when sinking air near the ground forms a "lid" over the region. The second type of inversion occurs when the air near the ground cools while the air aloft remains warm. This type of inversion occurs during winter nights and can cause localized air pollution "hot spots" near emission sources because of poor dispersion. The shallow surface-based inversions are present in the morning, but are often broken by daytime heating of the air layers near the ground.

AMBIENT AIR QUALITY IN THE PROJECT AREA

Concentrations of criteria air pollutants (ozone, PM_{10}, $PM_{2.5}$, CO, NO_2, SO_2, and lead) are used as indicators of ambient air quality conditions. 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 and the primary component of smog. Ozone, typically associated with poor air quality, is not emitted directly into the air, but is formed through a series of chemical reactions between reactive organic gases (ROG) and oxides of nitrogen (NO_X) in the presence of sunlight. Motor vehicles and stationary (industrial) sources are major sources of emission of both ROG and NO_X, which are also referred to as ozone precursors.

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 in the lower atmosphere (troposphere) is a major health and environmental concern. Because sunlight and heat serve as catalysts for the reactions between ozone precursors, peak ozone concentrations typically occur during summer in the Northern Hemisphere (U.S. Environmental Protection Agency 2006a). 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 1991).

The adverse health effects associated with exposure to ozone pertain primarily to the respiratory system. Scientific evidence indicates that ambient levels of ozone can 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 part per million (ppm) for 1–2 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 such symptoms as throat dryness, chest tightness, shortness of breath, headache, and nausea. In addition to these adverse health effects, some evidence also relates ozone exposure to an increase in susceptibility to respiratory infections (Godish 1991). Ozone causes substantial damage to leaf tissues of crops and natural vegetation and damages many materials by acting as a chemical oxidizing agent (Feather River Air Quality Management District 1998).

Emissions of ozone precursors in the project area have decreased in recent years and are projected to continue to decline in the future. On-road motor vehicles and other mobile sources are by far the largest contributors. More stringent mobile-source emission standards, cleaner burning fuels, and new rules for industrial operations have largely contributed to the decline in emissions trends. However, peak ozone values have not declined as quickly over the last several years as they have in other urban areas. This is because the urbanized areas of the Central Valley are identified as both transport contributors and receptors for these pollutants. Regardless, ozone concentrations have been declining in the project area because of the decrease in precursor emissions.

Particulate Matter

Health concerns associated with suspended particles focus on those particles small enough to reach the lungs when inhaled. Few particles larger than 10 micrometers in diameter reach the lungs. Therefore, respirable particulate matter is considered to consist of particles with an aerodynamic diameter of 10 micrometers or less, referred to as PM_{10}. PM_{10} consists of particulates directly emitted into the air, such as fugitive dust, soot, and smoke from mobile and stationary sources, construction operations, fires, and natural windblown dust, and particulates formed in the atmosphere by condensation and/or transformation of SO_2 and ROG (U.S. Environmental Protection Agency 2006a). Major sources of PM_{10} are the combustion of wood, diesel, and other fuels; industrial processes; and ground-disturbing activities such as construction and agricultural operations. In Yuba and Sutter Counties, the primary sources of PM_{10} are entrained road dust, farming operations, and agricultural burning (Feather River Air Quality Management District 1998).

Ambient PM_{10} standards are designed to prevent respiratory disease and protect visibility. 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 particulates (the piggybacking effect), or with fine dust particles of silica or asbestos. Generally, adverse health effects associated with PM_{10} may result from both short-term and long-term exposure to elevated PM_{10} concentrations and may include breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, alterations in the body's immune system, carcinogenesis, and premature death (U.S. Environmental Protection Agency 2006a).

Finer particles having an aerodynamic diameter of 2.5 micrometers or less are referred to as $PM_{2.5}$. $PM_{2.5}$ poses an increased health risk because these particles can deposit deep in the lungs and contain substances that are particularly harmful to human health.

Direct emissions of PM_{10} and $PM_{2.5}$ have increased in recent years and are projected to continue increasing in the near future. Emissions are dominated by contributions from areawide sources, primarily fugitive dust from paved and unpaved roads, fugitive dust from construction and demolition, and particulates from residential fuel combustion. Emissions of PM_{10} and $PM_{2.5}$ from mobile sources in the project area have remained relatively steady.

Carbon Monoxide

Carbon monoxide is a colorless, odorless, and poisonous gas produced by incomplete burning of carbon in fuels, primarily from mobile (transportation) sources of pollution. Approximately three-fourths of the nationwide CO emissions are estimated to be from mobile (transportation) sources; the remaining CO emissions are associated with wood-burning stoves, incinerators, and industrial sources. Peak CO levels are generally found near areas with high concentrations of mobile (transportation) sources and occur typically during calm conditions in the winter months.

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, slow reflexes, and fatigue. CO exposure is especially harmful to individuals who suffer from cardiovascular and respiratory diseases (U.S. Environmental Protection Agency 2006a).

Nitrogen Dioxide

Nitrogen dioxide 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 (U.S. Environmental Protection Agency 2006a). 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 approximately 4–12 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

Sulfur dioxide is produced by such stationary sources as coal and oil combustion, steel mills, refineries, and 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.

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 (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, 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 (U.S. Environmental Protection Agency 2006a).

As a result of EPA's regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector have declined dramatically (by 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 gasoline (U.S. Environmental Protection Agency 2006a).

The decrease in lead emissions and ambient lead concentrations over the past 25 years is California's most dramatic success story with regard to air quality management. 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 TAC.

Air Pollutant Sources and Concentrations

Approximately 60–70% of the air pollution in the FRAQMD area comes from mobile sources, which includes on-road and off-road motor vehicles (including cars, trucks, planes, trains, tractors, combines, buses, motorcycles, and boats). The remaining 30–40% of the air pollution in the FRAQMD area is a result of stationary sources that include agricultural operations, open burning of vegetative wastes, wood burning for residential heating, manufacturing industries, electric generation industries, diesel backup generators, retail gasoline and local bulk distribution facilities, auto body shops, dry cleaners, landfills, other human-made sources that emit air contaminants, and naturally occurring sources (including biological and geological sources, wildfires, and windblown dust) (Feather River Air Quality Management District 2006).

Air pollutant concentrations are measured at several monitoring stations in the NSVAB. The Yuba City air quality monitoring station on Almond Street is the closest monitoring station to the FRLRP project area with sufficient data to meet EPA and ARB criteria for quality assurance. In general, the ambient air quality measurements from this monitoring station are representative of the air quality in the project area.

Table 5.9-2, "Summary of Annual Air Quality Data from the Yuba City–Almond Street Air Quality Monitoring Station," summarizes the air quality data from this monitoring station for the years 2003–2005.

Table 5.9-2
Summary of Annual Air Quality Data from the Yuba City–Almond Street Monitoring Station

	2003	2004	2005
Ozone			
State standard (1-hour/8-hour avg., 0.09/0.07 ppm)			
National standard (8-hour avg., 0.08 ppm)			
Maximum concentration (1-hour/8-hour avg., ppm)	0.090/0.079	0.098/0.081	0.092/0.073
Number of days state standard exceeded	0	2	0
Number of days national 8-hour standard exceeded	0	0	0
Respirable particulate matter (PM_{10})			
State standard (24-hour avg., 50 µg/m³)			
National standard (24-hour avg., 150 µg/m³)			
Maximum concentration (µg/m³)	83.0	53.0	60.0
Number of days state standard exceeded (measured/calculated [a])	5/30.7	1/NA	5/31.1
Number of days national standard exceeded (measured/calculated [a])	0/0	0/0	0/0
Fine particulate matter ($PM_{2.5}$)			
No separate state standard			
National standard (24-hour avg., 65 µg/m³)			
Maximum concentration (µg/m³)	32.0	39.0	45.0
Number of days national standard exceeded (measured [b])	0	0	0
Carbon monoxide (CO)			
State standard (1-hour/8-hour avg., 20/9.1 ppm)			
National standard (1-hour/8-hour avg., 35/9.5 ppm)			
Maximum concentration (1-hour/8-hour avg., ppm)	4.30/2.36	5.80/2.54	4.40/3.39
Number of days state standard exceeded	0	0	0
Number of days national 1-hour/8-hour standard exceeded	0/0	0/0	0/0
Nitrogen dioxide (NO_2)			
State standard (1-hour avg., 0.25 ppm)			
National standard (annual, 0.053 ppm)			
Maximum concentration (1-hour avg., ppm)	0.080	0.066	0.062
Annual average (ppm)	0.014	0.012	0.012
Number of days state standard exceeded	0	0	0

Notes: µg/m³ = micrograms per cubic meter; NA = not available; ppm = parts per million by volume

[a] Measured days are those days when 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.

[b] The number of days a measurement was greater than the level of the national daily standard. Measurements are collected every day, every 3 days, or every 6 days, depending on the time of year and the site's monitoring schedule. The number of days above the standards is not directly related to the number of violations of the standard for the year.

Sources: California Air Resources Board 2006b, U.S. Environmental Protection Agency 2006c

Attainment Status

Both ARB and EPA use the type of monitoring data provided in Table 5.9-2 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." The "unclassified" designation 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 state and national attainment status designations for Yuba County are presented in Table 5.9-1. Yuba County is designated as a nonattainment area with respect to the state standards for ozone (1-hour) and PM_{10}, and is either in attainment or unclassified for the remaining state standards. Yuba County is either in attainment or unclassified for federal standards (Feather River Air Quality Management District 2006).

ARB does not establish attainment status designations for vinyl chloride because ARB has classified it as a TAC for which ARB has established an ACTM that reduces exposure below the safe threshold.

5.9.3 ENVIRONMENTAL IMPACTS

THRESHOLDS OF SIGNIFICANCE

Significance thresholds for total maximum daily emissions are used by air quality management districts as a guide to identify the level of significance that a project may have on the formation of ozone and a project's contribution to the district's overall PM_{10} load. The FRAQMD *Indirect Source Review Guidelines* and CEQA planning guidance (Feather River Air Quality Management District 1998, 2006) provide recommended thresholds of significance for project-generated emissions of ozone precursors and PM_{10}.

In accordance with these recommended thresholds, a project alternative would have a significant impact on air quality if any of the following would occur:

- project implementation would substantially conflict with or substantially obstruct implementation of the applicable air quality plan;

- project construction would result in emissions that exceed:
  - 25 pounds per day (lb/day) of ROG,
  - 25 lb/day of NO_X, or
  - 80 lb/day of PM_{10};

- operation of the project would result in regional emissions that exceed:
  - 25 lb/day of ROG,
  - 25 lb/day of NO_X, or
  - 80 lb/day of PM_{10};

- operation of the project would result in or contribute to local CO concentrations that exceed the California 1-hour or 8-hour CO ambient air quality standards of 20 ppm or 9 ppm, respectively; or

- project implementation would result in exposure of sensitive receptors to excessive concentrations of toxic air emissions, criteria air pollutants, or odorous emissions.

Implementation of any of the project alternatives considered would not result in any major sources of odor, and the project does not involve operation of any of the common types of facilities that are known to produce odors (e.g., landfill, coffee roaster, wastewater treatment facility). In addition, the diesel exhaust from the use of on-site construction equipment would be intermittent and temporary, and it would dissipate rapidly from the source with an increase in distance. Thus, implementation of the proposed project would not expose sensitive receptors to odorous emissions, and this issue is not discussed further in this environmental impact report (EIR).

IMPACT ANALYSIS

Analysis Method

Almost all increased pollutant emissions that would be associated with the proposed project would be generated by construction activities. Construction emissions are described as short term or temporary in duration. These short-term emissions, especially PM_{10}, have the potential to represent a significant air quality impact.

Fugitive dust emissions are associated primarily with site preparation and excavation and vary as a function of such parameters as soil silt content, soil moisture, wind speed, acreage of disturbance area, and vehicle miles traveled on-site and off-site. ROG and NO_X emissions are associated primarily with gas and diesel equipment exhaust and the application of architectural coatings. CO emissions are a direct function of vehicle idling time and, thus, traffic flow conditions.

The methodology used for estimating construction emissions associated with the levee repairs and potential levee setback was based on emission factors and assumptions obtained from the following sources:

- FRAQMD's *Indirect Source Review Guidelines* (Feather River Air Quality Management District 1998),

- FRAQMD CEQA planning guidance (Feather River Air Quality Management District 2006),

- the Sacramento Metropolitan Air Quality Management District's air quality thresholds of significance (Sacramento Metropolitan Air Quality Management District 2004),

- EPA's *Compilation of Air Pollutant Emission Factors* (U.S. Environmental Protection Agency 1985),

- the South Coast Air Quality Management District's *CEQA Air Quality Handbook* (South Coast Air Quality Management District 1993), and

- EMFAC 2002 (California Air Resources Board 2003).

Assumptions regarding construction equipment and personnel, haul distances, areas of disturbance, and durations and timing of different construction activities were developed based on the information provided in Chapter 4, "Description of the Proposed Project," and coordination with project engineers.

The conclusions regarding construction emissions are based on the maximum daily emissions calculated for the entire 20-month construction period (scheduled to start in 2007 and last through 2008). The potential overlap of activities (e.g., construction of the slurry cutoff wall, setback levee, and detention basin) was considered.

For purposes of the calculations of maximum potential daily emissions, unmitigated conditions were assumed for fugitive dust emissions (i.e., no dust-control measures were assumed to be applied). This standard method of calculating potential emissions is very conservative, given that modern construction practices include very active dust-control measures, such as watering of roadways and wetting of excavation areas and stockpiles.

Alternative 1 – The Levee Strengthening Alternative

Impact LS-5.9-a

Temporary Emissions of ROG, NO_X, and PM_{10} during Construction. Maximum daily emissions of ROG, NO_X, and PM_{10} associated with levee repair and strengthening activities would exceed FRAQMD's recommended significance thresholds and contribute to existing nonattainment conditions for ozone and PM_{10} in the NSVAB. This impact would be **significant.**

The total length of the existing Feather River and Yuba River levees in project Segments 1, 2, and 3 is approximately 13.1 miles, or roughly 69,000 feet. Repair and strengthening activities along 13.1 miles of levee would result in the temporary generation of construction-related emissions for approximately 2 years. In each year of the project most emissions would be generated between April 15 and November 1, which is considered outside of the "flood season." Fugitive dust and mobile-source emissions (such as motor vehicle exhaust) would be generated by various construction activities, including:

- the operation of equipment at the construction sites, employee commute trips, and the delivery of equipment and materials to the construction areas;

- ground disturbance associated with preparing work surfaces on and near the existing levee; installing seepage control measures such as slurry cutoff walls, relief wells, and seepage/stability berms; and excavation of material from borrow areas and the proposed detention basin site;

- construction of the replacement for Pump Station No. 3 and demolition of the existing pump station.

The anticipated equipment types, borrow quantities and sources, and truck trips required for construction of the setback levee are described under Section 4.3.3, "Alternative 1—Construction," in Chapter 4, "Description of the Proposed Project." Detailed calculations are shown in Appendix E of this EIR, "Calculations of Construction-Related Emissions." The following discussions describe the main assumptions used in the calculations and summarize the results.

Assumptions

It was assumed for purposes of emissions calculations that the following mobile heavy-construction equipment could be used for general levee repair, construction of slurry cutoff walls, berm construction, borrow/detention basin excavation, and construction of Pump Station No. 3:

- eight excavators,
- six scrapers,
- six bulldozers,
- three graders,
- three rollers,
- two water trucks,
- 20 highway dump trucks,
- one crane,
- one loader, and
- four additional pieces of mobile equipment (e.g., tool carrier trucks, lubricating trucks).

Please note that the air quality model used for this analysis requires entries for specific types of construction equipment included in the model. The model does not provide entries for all types of construction equipment listed in Section 4.3.3, "Alternative 1—Construction." Therefore, the equipment listed above is intended to represent an approximation of the equipment described in Section 4.3.3.

The amount and types of equipment used during construction activities would vary from day to day depending on the specific activities being conducted. The number of off-site vehicle trips is also anticipated to vary from day to day. For purposes of calculating the maximum potential daily emissions, it was assumed that the equipment listed above would operate simultaneously for 16 hours on a day of maximum construction activity. This is a very conservative assumption used to calculate potential maximum daily emissions.

A peak construction labor force of 100 employees and an average travel distance of 10 miles to the construction site were assumed.

The daily average area of ground disturbance was estimated by calculating an estimated footprint for the levee repair work area, including additional acreage to account for staging areas, detention basin construction, potential soil borrow sites, and other activities, and dividing the total by the expected number of work days. As mentioned above, the total length of the existing Feather River and Yuba River levees in the three project segments is about 13.1 miles, or 69,000 feet. For purposes of this analysis, the average width of the levee repair work area was assumed to be 100 feet (the actual average width is likely to be less). The area of land disturbance would therefore be approximately 6.9 million square feet, or 158 acres. The detention basin/borrow area is expected to cover approximately 150 acres, and seepage/stability berms are expected to cover approximately 30 acres. To account for ground disturbance associated with staging areas and other activities, an additional 50 acres was added to the disturbance area, although the actual acreage of additional disturbance is expected to be less. The total estimated acreage of ground disturbance was therefore assumed to be approximately 388 acres. Based on the assumption that the period of active ground disturbance would total 440 days (22 active construction days per month over 20 months), the average daily disturbance area was calculated to be approximately 0.88 acre.

The emissions calculations also included 4,910 truck trips to haul aggregate base, concrete, demolition debris, bentonite, and other materials to and within the site. These materials were assumed to be transported an average of 5.5 miles on paved roads. This estimate of haul trips exceeds estimates elsewhere in this DEIR (e.g., Section 4.3.3, "Alternative 1—Construction"; and Section 5.11, "Transportation and Circulation") to provide a margin of error and to ensure that emissions are not underrepresented. In addition, the emission calculations include sufficient haul trips to move 1.6 million cy of borrow material.

Results

Average daily construction emissions were calculated for completion of Alternative 1. It was assumed that there would be 440 active construction work days during the 2-year construction period. Detailed calculations of the maximum daily temporary emissions are shown in Appendix E. Table 5.9-3, "Summary of Maximum Daily Average Construction Emissions for Alternative 1," summarizes the results for this alternative. As indicated in the table, the maximum unmitigated daily emissions associated with Alternative 1 were estimated at 166 lb/day of ROG, 816 lb/day of NO_X, and 692 lb/day of PM_{10}.

Table 5.9-3
Summary of Maximum Daily Average Construction Emissions for Alternative 1

Emission Source	Pollutant (lb/day)		
	ROG	**NO_X**	**PM_{10}**
Mobile-Source Equipment	165	814	43
Employee Trips	1	2	0
Fugitive Dust			649
Total Unmitigated	**166**	**816**	**692**
FRAQMD Threshold	**25**	**25**	**80**

Notes: FRAQMD = Feather River Air Quality Management District; lb/day = pounds per day; NO_X = oxides of nitrogen; PM_{10} = particles with an aerodynamic diameter of 10 micrometers or less; ROG = reactive organic gases
See Appendix E for assumptions and modeling results.
Source: Data compiled by EDAW in 2006

Based on the conservative assumptions described above, the maximum daily emissions under Alternative 1 would exceed FRAQMD's recommended significance thresholds of 25 lb/day for

ROG, 25 lb/day for NO_X, and 80 lb/day for PM_{10}. In addition, Yuba County is designated as a nonattainment area for the national and state ozone (1-hour) standards and as a nonattainment area for the state PM_{10} standard. Because maximum construction emissions of ROG, NO_X, and PM_{10} would exceed FRAQMD thresholds and would contribute to existing nonattainment conditions in the NSVAB, this impact would be significant.

Impact LS-5.9-b

Long-Term Changes in Emissions of ROG, NO_X, and PM_{10} Associated with Levee Repairs and Strengthening. The proposed levee repairs and strengthening are expected to contribute only minimally, if at all, to long-term emissions of pollutants through potential vehicle trips related to occasional maintenance activities. The resulting increase in long-term emissions would be small; therefore, this impact would be **less than significant.**

The only operational activities associated with Alternative 1 would be the continuation of maintenance activities that are currently performed along the existing Feather River and Yuba River levees. The only potential mechanism for changes in operation or maintenance activities under Alternative 1 are the possible installation of relief wells and the relocation and possible increase in capacity at Pump Station No. 3. Relief wells are being considered in the preliminary project design as a method to address levee underseepage. However, a final determination as to the usage, number, and location of relief wells would be made as part of the detailed design process. Relief wells can be prone to plugging and damage from vandalism, and require operation (water removal) and periodic maintenance (flushing, cleaning, and replacement) to remain effective over the long term. If relief wells are installed, these maintenance activities could generate vehicle trips to the levees; however, such trips would be infrequent, and they are not expected to contribute measurably to long-term regional or local vehicle emissions.

If relief wells are included in Alternative 1, the capacity at the new/relocated Pump Station No. 3 would need to be greater than the capacity at the existing pump station to accommodate water generated by the relief wells. However, such an increase in capacity would not result in a significant increase in maintenance requirements. Replacement of Pump Station No. 3 could potentially reduce the need for maintenance activities because the existing exposed pump facility would be replaced by new pump equipment enclosed in a structure. Under any scenario associated with the relocation of Pump Station No. 3, if additional vehicle trips for maintenance are necessary, such additional trips would be infrequent and are not expected to contribute measurably to long-term regional or local vehicle emissions.

Replacement of Pump Station No. 3 could result in the use of an emergency backup generator at the new facility. If installed, such a backup generator would be subject to FRAQMD permitting and BACT requirements and thus would not be considered to have significant air-quality impacts. In fact, air districts typically do not even require the inclusion of such emissions in CEQA analyses unless the operation of a stationary source would result in surplus emissions in excess of BACT and offsets.

Therefore, the overall long-term effect of Alternative 1 on local and regional pollutant emissions is expected to be a negligible increase, if any, in emissions of ROG, NO_X, and PM_{10}. In addition, because Alternative 1 would not generate substantial vehicle trips and associated vehicle miles traveled, the project would be in compliance with the NSVAB AQAP. Thus, implementation of

Alternative 1 would not conflict with or obstruct implementation of the applicable air quality plan. This impact would be less than significant.

Impact LS-5.9-c

Exposure of Sensitive Receptors to Toxic Air Emissions. Emissions of TACs associated with construction or operations under Alternative 1 would not result in exposure of receptors to concentrations of TACs in excess of applicable thresholds. This impact would be **less than significant**.

Short-Term Construction Sources

Levee repair and strengthening activities would result in short-term emissions of diesel exhaust from on-site heavy-duty equipment. ARB identified particulate exhaust emissions from diesel-fueled engines (diesel PM) as a TAC in 1998. Construction under Alternative 1 would result in the generation of diesel PM emissions from the use of off-road diesel equipment required for site grading and excavation, and other construction activities. According to ARB, the potential cancer risk from the inhalation of diesel PM, as discussed below, outweighs the potential noncancer health impacts.

The dose to which receptors are exposed (a function of concentration and duration of exposure) is the primary factor used to determine the health risk (i.e., potential exposure to TAC emission levels that exceed applicable standards). 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 California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA), 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 project (Salinas, pers. comm., 2004).

Thus, short-term construction activities would not expose sensitive receptors to substantial pollutant concentrations for the following reasons:

- the overall use of mobilized equipment would be temporary (approximately 1% of the 70-year exposure period);
- equipment would move regularly down the linear construction corridor, further limiting the exposure period at any one location because diesel PM dissipates rapidly with an increase in distance from the source (Zhu et al. 2002);
- there are no sensitive receptors located in the immediate vicinity of a majority of the project site; and
- where there are sensitive receptors nearby (only in project Segment 3), they would be located at least 75 feet from the construction area.

As a result, this impact would be less than significant.

Long-term Operational Sources

Alternative 1 would not result in a net increase of long-term emissions of TACs from mobile sources. Long-term operations under this alternative would not require any additional employees and thus would not result in any emissions of TACs associated with employee commute trips. Also with respect to mobile-source emissions, as stated previously under Impact LS-5.9-b, maintenance-related trips would be negligible.

Furthermore, implementation of Alternative 1 would not result in the operation of any new major stationary emission sources of TACs. Specifically, long-term operations would include the use of an emergency backup generator at the new Pump Station No. 3, which would serve as a replacement for the existing Pump Station No. 3; however, such a stationary source would be subject to FRAQMD permitting and toxic (T)-BACT requirements. Before granting a permit for sources, FRAQMD would perform or refer to a formal health-risk assessment to ensure that operations would not result in the exposure of sensitive receptors to levels of TAC emissions that exceed the recommended threshold. Thus, long-term operational sources would not expose sensitive receptors to substantial pollutant concentrations. As a result, this impact would be less than significant.

Alternative 2 – The Levee Strengthening and ASB Setback Levee Alternative

Impact ASB-5.9-a

Temporary Emissions of ROG, NO_X, and PM_{10} during Construction. Maximum daily emissions of ROG, NO_X, and PM_{10} associated with levee repair and strengthening activities in project Segments 1 and 3 and construction of the Above Star Bend (ASB) setback levee in Segment 2 would exceed FRAQMD's recommended significance thresholds and contribute to existing nonattainment conditions for ozone and PM10 in the NSVAB. This impact would be **significant.**

See the discussion of Impact LS-5.9-a for Alternative 1 above. Levee repair and strengthening activities and construction of the ASB setback levee would result in the temporary generation of construction-related emissions for approximately the same length of time and during the same periods as construction activities assumed under Alternative 1. Construction activities in project Segments 1 and 3 would be the same as under Alternative 1, but fugitive dust and mobile-source emissions would be expected to be greater under Alternative 2 because a new setback levee would be constructed in Segment 2 and the existing Feather River levee removed in this project segment, resulting in a larger construction area and disturbed surface and hauling of greater volumes of soil.

The anticipated equipment types, borrow quantities and sources, and truck trips required for construction of the ASB setback levee are described under Section 4.4.3, "Alternative 2—Construction," in Chapter 4. Detailed calculations are shown in Appendix E of this EIR. The following discussions describe the main assumptions used in the calculations and summarize the results.

Assumptions

It was assumed for purposes of emissions calculations that the following mobile heavy-construction equipment could be used for general levee repair, construction of slurry cutoff walls, berm construction (if needed), construction of Pump Station No. 3, and construction of the ASB setback levee foundation and embankment:

- six excavators,
- 10 scrapers,
- six bulldozers,
- four graders,
- four rollers,
- two water trucks,
- 20 highway dump trucks,
- one crane,
- one loader, and
- three additional pieces of mobile equipment (e.g., tool carrier trucks, lubricating trucks).

Please note that the air quality model used for this analysis requires entries for specific types of construction equipment included in the model. The model does not provide entries for all types of construction equipment listed in Section 4.4.3, "Alternative 2—Construction." Therefore, the equipment listed above is intended to represent an approximation of the equipment described in Section 4.4.3.

The amount and types of equipment used during construction activities would vary from day to day depending on the specific activities being conducted. The number of off-site vehicle trips is also anticipated to vary from day to day. For purposes of calculating the maximum potential daily emissions, it was assumed that the equipment listed above would operate simultaneously for 16 hours on a day of maximum construction activity. This is a very conservative assumption used to calculate potential maximum daily emissions.

A peak construction labor force of 100 employees and an average travel distance of 10 miles to the construction site were assumed.

The daily average area of ground disturbance was estimated by adding the approximate areas of the existing levee segments to be repaired and strengthened (project Segments 1 and 3) or removed (Segment 2), the footprint of the ASB setback levee, and the proposed borrow sites, then dividing the total by the expected number of work days. The existing Feather River levee segment along Segment 2 that would be removed is a total of approximately 6.5 miles long. The area cleared would be approximately 6.86 million square feet (34,320 feet long x 200 feet wide), or 158 acres. The new setback levee would be approximately 5.9 miles long. The maximum area of ground disturbance would be approximately 10.9 million square feet (31,152 feet long x 350 feet wide), or 250 acres. The total length of the existing Feather River and Yuba River levees in project Segments 1 and 3 is about 6.6 miles, or 34,850 feet. For purposes of this analysis, the average width of the levee repair work area was assumed to be 100 feet (the actual average width is likely to be less). The area of land disturbance would therefore be approximately 3.5 million square feet, or 80 acres. The soil borrow area and detention basin/borrow area currently being considered covers approximately 689 acres. Although it is unlikely that this entire area would be disturbed, it is assumed for the emission calculations that construction would affect the entire 689 acres. To account for ground disturbance associated with staging areas and other activities, an additional 50 acres was added to the disturbance area, although the actual acreage of additional disturbance is expected to be less. The total estimated acreage of ground disturbance was therefore assumed to be approximately 1,230 acres. Based on the assumption that the period of active ground disturbance would total 440 days (22 active construction days per month over 20 months), the average daily disturbance area under Alternative 2 was calculated to be about 2.8 acres.

The emissions calculations also included 2,700 truck trips to haul aggregate base and drain rock, concrete, demolition debris, bentonite, and other materials to and within the site. These materials were assumed to be transported an average of 5.5 miles on paved roads. This estimate of haul trips exceeds estimates elsewhere in this DEIR (e.g., Section 4.4.3, "Alternative 2—Construction"; and Section 5.11, "Transportation and Circulation") to provide a margin of error and to ensure that emissions are not underrepresented. In addition, the emissions calculations include sufficient haul trips to move 3.3 million cy of borrow material for construction of the ASB setback levee.

Results

Average daily construction emissions were calculated for completion of Alternative 2. It was assumed that there would be 440 active construction work days during the 2-year construction period. Detailed calculations of the maximum daily temporary emissions are shown in Appendix E. Table 5.9-4, "Summary of Maximum Daily Average Construction Emissions for Alternative 2," summarizes the results for this alternative. As indicated in the table, the maximum unmitigated daily emissions associated with Alternative 2 were estimated at 188 lb/day of ROG, 938 lb/day of NO_X, and 1,447 lb/day of PM_{10}.

Table 5.9-4
Summary of Maximum Daily Average Construction Emissions for Alternative 2

Emission Source	Pollutant (lb/day)		
	ROG	**NO_X**	**PM_{10}**
Mobile-Source Equipment	187	936	49
Employee Trips	1	2	0
Fugitive Dust			1,398
Total Unmitigated (Levee)	**188**	**938**	**1,447**
FRAQMD Threshold	**25**	**25**	**80**

Notes: FRAQMD = Feather River Air Quality Management District; lb/day = pounds per day; NO_X = oxides of nitrogen; PM_{10} = particles with an aerodynamic diameter of 10 micrometers or less; ROG = reactive organic gases. Results are rounded to the nearest whole number.
See Appendix E for assumptions and modeling results.
Source: Data compiled by EDAW in 2006

Based on the conservative assumptions described above, maximum emissions under Alternative 2 would exceed FRAQMD's recommended significance thresholds of 25 lb/day for ROG, 25 lb/day for NO_X, and 80 lb/day for PM_{10}. In addition, Yuba County is designated as a nonattainment area for the national and state ozone (1-hour) standards and as a nonattainment area for the state PM_{10} standard. Because construction emissions of ROG, NO_X, and PM_{10} would exceed the FRAQMD thresholds and would contribute to existing nonattainment conditions in the NSVAB, this impact would be significant.

Impact ASB-5.9-b

Long-Term Changes in Emissions of ROG, NO_X, and PM_{10} Associated with Levee Repairs and Strengthening and the Levee Setback. The proposed levee repairs and strengthening in project Segments 1 and 3 and the ASB levee setback in Segment 2 would be expected to contribute only minimally, if at all, to long-term emissions of pollutants through vehicle trips related to occasional maintenance activities. The potential cessation of agricultural uses on some lands in the levee setback area could result in a decrease in long-term pollutant emissions in this area, particularly PM_{10} emissions associated with agricultural land disturbance and burning operations. Such a reduction would be a small **potentially beneficial** effect on air quality.

For project Segments 1 and 3 and for the relocation of Pump Station No. 3, this impact would be the same as described above for Impact LS-5.9-b under Alternative 1. Changes to operations and maintenance activities in these areas, if any, would not result in significant increases in emissions.

Along the ASB setback levee in project Segment 2, levee maintenance activities would be the same as for the existing levee in almost all respects. The only potential difference between the operation and maintenance of the new setback levee and current practice would be the possible use of relief wells along the setback levee. Relief wells are being considered in the preliminary project design as a method to address levee underseepage. However, a final determination as to the usage, number, and location of relief wells would be made as part of the detailed design process. Relief wells can be prone to plugging and damage from vandalism, and require operation (water removal) and periodic maintenance (flushing, cleaning, and replacement) to remain effective over the long term. If relief wells are installed, these maintenance activities could generate vehicle trips to the levees; however, such trips would be infrequent, and they are not expected to contribute measurably to long-term regional or local vehicle emissions.

Land use changes that are possible as part of implementation of the levee setback could have small but measurable beneficial effects on long-term pollutant emissions affecting regional and local air quality. Setting back the levee could allow for the conversion of some land from agricultural uses to riparian and wetland areas. If habitat restoration is implemented in any locations in the setback area, the restored areas would be removed from agricultural production. As noted previously, the primary sources of PM_{10} in Yuba and Sutter Counties are entrained road dust, farming operations, and agricultural burning (Feather River Air Quality Management District 1998). Agricultural emissions are typically unmitigated, although burning is regulated by FRAQMD such that it is prohibited on days of decreased air quality.

The cessation of agricultural uses on some of the lands in the ASB levee setback area would result in reductions in land disturbance such as plowing and disking; the use of tractors, bulldozers, and other heavy mobile farm equipment on unpaved ground; and agricultural burning. There is not sufficient information to quantify the amount of the potential decrease in pollutants associated with any long-term land use changes. However, examination of some of the standard emission factors used in calculating fugitive dust emissions provides some indication of the potential size of PM_{10} emissions that may be associated with typical farming activities. As indicated in Table 5.9-5, “Standard Factors Used in Evaluating Fugitive Dust Emissions,” plowing 20 acres in a day could release more than 1,700 lb/day (20 x 85.6) of fugitive dust, and the equivalent of one truck (or other heavy equipment, such as a harvester) traveling 10 miles on an unpaved road could cause the emission of 230 lb/day (1 x 10 x 23).

In addition to decreases in fugitive dust emissions, any reduced agricultural use of lands in the levee setback area would also likely result in a decrease in the emission of ozone (ROG and NO_X) because of the reduction in the regular, long-term use of heavy mobile farm equipment.

Table 5.9-5
Standard Factors Used in Evaluating Fugitive Dust Emissions

Activity	Unit of Measure	Emission Factor (lb/day)
Dirt/debris/grading	Number of pieces of equipment operating during 1 hour	21.8
Exposed graded surfaces	Acres per day	85.6
Truck travel on unpaved roads	Miles traveled per day	23

Note: lb/day = pounds per day
Source: South Coast Air Quality Management District 1993

In contrast, the long-term use of lands as riparian/wetland habitat would not be expected to generate pollutant emissions, except for possible increases in emissions from vehicle trips to the levee setback area associated with recreational uses. If substantially increased recreational uses are envisioned as a result of subsequent design of land uses in the levee setback area, long-term air quality effects may need to be considered in more detail in additional environmental review. However, substantial increases in vehicle trips associated with recreational use of the levee setback area are not anticipated, and any increases in emissions associated with recreational uses are not currently expected to offset the decrease in emissions that would be associated with decreased agricultural uses. Therefore, the overall long-term effect of the levee setback on local and regional pollutant emissions could potentially be a reduction in emissions of ROG, NO_X, and PM_{10}. A decrease in operational emissions would be a beneficial effect on long-term air quality conditions.

Impact ASB-5.9-c

Exposure of Sensitive Receptors to Toxic Air Emissions. Emissions of TACs associated with construction or operations under Alternative 2 would not result in exposure of receptors to concentrations of TACs in excess of applicable thresholds. This impact would be **less than significant**.

This impact would be similar to Impact LS-5.9-c, described under Alternative 1 above. Although construction equipment would operate in different locations with construction of the ASB setback levee than under Alternative 1 (e.g., along the ASB setback alignment, in soil borrow areas, in the levee setback area), the same mechanisms and potential for exposure to TACs would occur. Because construction would occur in different locations, there is the potential for different or additional sensitive receptors to be nearby. However, no sensitive receptors would be closer than the distance identified for Alternative 1 (no closer than 75 feet). For the same reasons as described above, this impact would be less than significant.

Alternative 3 – The Levee Strengthening and Intermediate Setback Alternative

Impact IS-5.9-a

Temporary Emissions of ROG, NO_X, and PM_{10} during Construction. This impact would be the same as Impact ASB-5.9-a, described under Alternative 2 above. For the same reasons as described above, this impact would be **significant**.

Impact IS-5.9-b

Long-Term Changes in Emissions of ROG, NO_X, and PM_{10} Associated with Levee Repairs and Strengthening and the Levee Setback. This impact would be the same as Impact ASB-5.9-b, described under Alternative 2 above. Potential beneficial effects on air quality could be slightly less because the levee setback area would be smaller, and, thus, slightly less agricultural land has the potential to be converted to nonagricultural use. However, operational emissions would still be negligible under Alternative 3. As a result, for the same reasons as described above, this impact would be **potentially beneficial**.

Impact IS-5.9-c

Exposure of Sensitive Receptors to Toxic Air Emissions. This impact would be the same as Impact ASB-5.9-c, described under Alternative 2 above. For the same reasons as described above, this impact would be **less than significant**.

5.9.4 MITIGATION MEASURES

ALTERNATIVE 1—THE LEVEE STRENGTHENING ALTERNATIVE

No mitigation is required for Impact LS-5.9-b (long-term changes in ROG, NO_X, and PM_{10} emissions) or Impact LS-5.9-c (exposure to toxic air emissions).

Mitigation is provided below for Impact LS-5.9-a (construction-related emissions of ROG, NO_X, and PM_{10}).

LS-5.9-a Implement FRAQMD Pollution-Control Measures to Minimize Temporary Emissions of ROG, NO_X, and PM_{10} during Construction. This mitigation would reduce the impact, but not to a less-than-significant level.

FRAQMD's *Indirect Source Review Guidelines* and online CEQA guidance provide mitigation measures for reducing short-term air quality impacts. As recommended by FRAQMD, Three Rivers Levee Improvement Authority shall ensure that the following mitigation measures (summarized from FRAQMD guidance) are implemented during all project construction activities to the extent practicable. In addition, construction of the proposed project is required to comply with all applicable FRAQMD rules and regulations, in particular Rule 3.0 (Visible Emissions), Rule 3.16 (Fugitive Dust Emissions), and Rule 3.15 (Architectural Coatings).

1. Implement a Fugitive Dust Control Plan that includes the following measures (see Appendix E):

- All grading operations on a project should be suspended when winds carry dust beyond the property line despite implementation of all feasible dust control measures. Consideration should be given to suspending all project grading when winds exceed 20 mph to minimize the risk of dust being carried beyond the property line.

- Construction sites shall be watered as directed by the [Yuba County] Department of Public Works or FRAQMD and as necessary to prevent fugitive dust violations.

- An operational water truck should be on-site at all times. Apply water to control dust as needed to prevent visible emissions violations and offsite dust impacts.

- On-site dirt piles or other stockpiled particulate matter should be covered, wind breaks installed, and water and/or soil stabilizers employed to reduce windblown dust emissions. Incorporate the use of approved nontoxic soil stabilizers according to manufacturer's specifications to all inactive construction areas.

- All transfer processes involving a free fall of soil or other particulate matter shall be operated in such a manner as to minimize the free fall distance and fugitive dust emissions.

- Apply approved chemical soil stabilizers according to the manufacturers' specifications, to all inactive construction areas (previously graded areas that remain inactive for 96 hours) including unpaved roads and employee/equipment parking areas.

- To prevent track-out, wheel washers should be installed where project vehicles and/or equipment exit onto paved streets from unpaved roads. Vehicles and/or equipment shall be washed prior to each trip. Alternatively, a gravel bed may be installed as appropriate at vehicle/equipment site exit points to effectively remove soil buildup on tires and tracks to prevent/diminish track-out.

- Paved streets shall be swept frequently (water sweeper with reclaimed water recommended; wet broom) if soil material has been carried onto adjacent paved, public thoroughfares from the project site.

- Provide temporary traffic control as needed during all phases of construction to improve traffic flow, as deemed appropriate by the Department of Public Works and/or Caltrans [California Department of Transportation] and to reduce vehicle dust emissions.

- Reduce traffic speeds on all unpaved surfaces to 15 mph or less and reduce unnecessary vehicle traffic by restricting access. Provide appropriate training, on-site enforcement, and signage.

- Reestablish ground cover on the construction site as soon as possible and prior to final occupancy, through seeding and watering.

- No open burning of vegetative waste (natural plant growth wastes) or other materials (trash, demolition debris et al.) may be conducted at the project site. Materials also may not be hauled off-site for disposal by open burning Vegetative wastes should be chipped or delivered to waste to energy facilities (permitted biomass facilities), mulched, composted, or used for firewood.

2. Construction equipment exhaust emissions shall not exceed FRAQMD Regulation III, Rule 3.0 ("Visible Emissions") limitations (40% opacity or Ringelmann 2.0). Operators of vehicles and equipment found to exceed opacity limits shall take action to repair the equipment within 72 hours or remove the equipment from service. Failure to comply may result in a Notice of Violation.

3. The primary contractor shall be responsible to ensure that all construction equipment is properly tuned and maintained prior to and for the duration of onsite operation.

4. Limit vehicle and equipment idling times to 10 minutes—saves fuel and reduces emissions.

5. Use existing power sources (e.g., power poles) or clean fuel generators rather than temporary power generators.

6. Develop and implement a traffic plan to minimize traffic flow interference from construction activities. The plan may include advance public notice of routing, use of public transportation, and satellite parking areas with a shuttle service. Schedule operations affecting traffic for off-peak hours. Minimize obstruction of through-traffic lanes. Provide a flag person to guide traffic properly and ensure safety at construction sites.

7. Portable engines and portable engine-driven equipment units used at the project work site, with the exception of on-road and off-road motor vehicles, may require ARB Portable Equipment Registration with the state or a local district permit. The owner/operator shall be responsible for arranging appropriate consultations with ARB or the District [FRAQMD] to determine registration and permitting requirements prior to equipment operation at the site.

8. The proponent shall assemble a comprehensive inventory list (i.e. make, model, engine year, horsepower, and emission rates) of all heavy-duty off-road (portable and mobile) equipment (50 horsepower and greater) that will be used an aggregate of 40 or more hours for the construction project and apply the following mitigation measure:

Reducing NO_X emissions from off-road diesel powered equipment

The project shall provide a plan for approval by FRAQMD demonstrating that the heavy-duty (equal to or greater than 50 horsepower) off-road equipment to be used in the construction project, including owned, leased and subcontractor vehicles, will achieve a projectwide fleet-average 20% NO_X reduction and 45% particulate reduction[1] compared to the most recent ARB fleet average at time of construction.

The FRAQMD Fugitive Dust Control Plan is included in Appendix E.

Implementing the FRAQMD measures is expected to achieve a 5% reduction in ROG emissions from construction equipment, 20% reduction in NO_X emissions from construction equipment, 45% reduction in PM_{10} emissions from construction equipment, and 75% reduction in fugitive dust emissions (Sacramento Metropolitan Air Quality Management District 2004). The resulting maximum average daily emissions with implementation of Alternative 1, as shown in Table 5.9-6, "Summary of Maximum Daily Average Construction Emissions with Mitigation Incorporated," are calculated to be 158 lb/day of ROG, 653 lb/day of NO_X, and 186 lb/day of PM_{10}.

Table 5.9-6
Summary of Maximum Daily Average Construction Emissions with Mitigation Incorporated

Total Emissions	Pollutant (lb/day)		
	ROG	**NO_X**	**PM_{10}**
Alternative 1			
Total Unmitigated	166	816	692
Total Mitigated [1]	158	653	186
FRAQMD Threshold	25	25	80
Alternatives 2 and 3			
Total Unmitigated	188	938	1,447
Total Mitigated [1]	179	751	377
FRAQMD Threshold	25	25	80

Notes: FRAQMD = Feather River Air Quality Management District; lb/day = pounds per day; NO_X = oxides of nitrogen; PM_{10} = particles with an aerodynamic diameter of 10 micrometers or less; ROG = reactive organic gases

[1] Based on a 5% reduction in ROG emissions from construction equipment, 20% reduction in NO_X emissions from construction equipment, 45% reduction in PM_{10} emissions from construction equipment, and 75% reduction in fugitive dust emissions (Sacramento Metropolitan Air Quality Management District 2004).

See Appendix E for assumptions and modeling results.

Source: Data compiled by EDAW in 2006

These mitigated emissions would exceed the FRAQMD thresholds of 25 lb/day for ROG, 25 lb/day for NO_X, and 80 lb/day for PM_{10}. Therefore, although the impact would be reduced, implementing Mitigation Measure LS-5.9-a would not reduce the impact related to construction-related emissions to a less-than-significant level.

[1] Acceptable options for reducing emissions may include use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology (Carl Moyer Guidelines), after-treatment products, voluntary offsite mitigation projects, provide funds for air district off-site mitigation projects, and/or other options as they become available. The District should be contacted to discuss alternative measures.

ALTERNATIVE 2—THE LEVEE STRENGTHENING AND ASB SETBACK LEVEE ALTERNATIVE

No mitigation is required for Impact ASB-5.9-b (long-term changes in ROG, NO_X, and PM_{10} emissions) or Impact ASB-5.9-c (exposure to toxic air emissions).

Mitigation is provided below for Impact ASB-5.9-a (construction-related emissions of ROG, NO_X, and PM_{10}).

ASB-5.9-a **Implement FRAQMD Pollution-Control Measures to Minimize Temporary Emissions of ROG, NO_X, and PM_{10} during Construction.** This measure is identical to Mitigation Measure LS-5.9-a above. This mitigation would reduce the impact (see Table 5.9-6), but not to a less-than-significant level.

ALTERNATIVE 3—THE LEVEE STRENGTHENING AND INTERMEDIATE SETBACK LEVEE ALTERNATIVE

No mitigation is required for Impact IS-5.9-b (long-term changes in ROG, NO_X, and PM_{10} emissions) or Impact IS-5.9-c (exposure to toxic air emissions).

Mitigation is provided below for Impact IS-5.9-a (construction-related emissions of ROG, NO_X, and PM_{10}).

IS-5.9-a **Implement FRAQMD Pollution-Control Measures to Minimize Temporary Emissions of ROG, NO_X, and PM_{10} during Construction.** This measure is identical to Mitigation Measure LS-5.9-a above. This mitigation would reduce the impact (see Table 5.9-6), but not to a less-than-significant level.

5.9.5 IMPACTS REMAINING SIGNIFICANT AFTER MITIGATION

ALTERNATIVE 1—THE LEVEE STRENGTHENING ALTERNATIVE

Impact LS-5.9-a (Temporary emissions of ROG, NO_X, and PM_{10} during construction) would remain significant and unavoidable after mitigation.

ALTERNATIVE 2—THE LEVEE STRENGTHENING AND ASB SETBACK LEVEE ALTERNATIVE

Impact ASB-5.9-a (Temporary emissions of ROG, NO_X, and PM_{10} during construction) would remain significant and unavoidable after mitigation.

ALTERNATIVE 3—THE LEVEE STRENGTHENING AND INTERMEDIATE SETBACK LEVEE ALTERNATIVE

Impact IS-5.9-a (Temporary emissions of ROG, NO_X, and PM_{10} during construction) would remain significant and unavoidable after mitigation.