3.4 Air Quality and Greenhouse Gas Emissions

3.4.1 Introduction

This section describes air quality conditions and greenhouse gas (GHG) emissions in the study area and the potential impacts of the types of restoration projects that would be permitted under the Order. (See Section 2.6, *Categories of Restoration Projects in the Order*.) The environmental setting and evaluation of impacts related to air quality and GHG emissions are based on a review of existing published documents, including air quality plans and climate action plans; information on example projects similar to those permitted under the Order that may be implemented by other agencies; and other information sources listed in Chapter 8, *References*. Restoration projects that would be permitted under the Order that could impair air quality are evaluated in this section. No comments on air quality and GHG emissions were received in response to the notice of preparation (NOP). See Appendix B for the NOP comment letters.

3.4.2 Environmental Setting

In California, regional or local air districts have been established to administer air pollution laws and regulations that protect air quality within designated air basins. Table 3.4-1 lists the air basins in the study area.

Air Quality

Background

Criteria Air Pollutants

As required by the federal Clean Air Act (CAA), which was enacted in 1970, the U.S. Environmental Protection Agency (EPA) has identified six criteria air pollutants (CAPs) for which state and national health-based ambient air quality standards have been established. EPA calls these pollutants “criteria air pollutants” because the agency has regulated them by developing specific public health– and welfare-based criteria as the basis for setting permissible levels. Ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable and fine particulate matter (PM_{10} and $PM_{2.5}$), and lead are the six CAPs.

Ozone

Ozone is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) (referred to by some regulating agencies as volatile organic compounds), and oxides of nitrogen (NO_X). The main sources of ROG and NO_X, often referred to as ozone precursors, are products of combustion processes (including motor vehicle engines) and the evaporation of solvents, paints, and fuels. Ozone is a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production through the photochemical reaction process. Ozone causes eye irritation, airway constriction, and shortness of breath and can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema.

Table 3.4-1
Air Basins in the Study Area

Air Basin	Counties in the Air Basin
Great Basin Valleys	Alpine, Inyo, Mono
Lake County	Lake
Lake Tahoe	El Dorado, Placer
Mojave Desert	Kern, Los Angeles, San Bernardino, Riverside
Mountain Counties	Amador, Calaveras, El Dorado, Mariposa, Nevada, Placer, Plumas, Sierra, Tuolumne
North Central Coast	Monterey, San Benito, Santa Cruz
North Coast	Del Norte, Humboldt, Mendocino, Sonoma, Trinity
Northeast Plateau	Lassen, Modoc, Siskiyou
Sacramento Valley	Butte, Colusa, Glenn, Placer, Sacramento, Shasta, Solano, Sutter, Tehama, Yolo, Yuba
Salton Sea	Imperial, Riverside
San Diego	San Diego
San Francisco Bay Area	Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma
San Joaquin Valley	Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, Tulare
South Central Coast	San Luis Obispo, Santa Barbara, Ventura
South Coast	Los Angeles, Orange, Riverside, San Bernardino

SOURCE: Data compiled by Environmental Science Associates in 2020

Carbon Monoxide

CO is an odorless, colorless gas usually formed as the result of the incomplete combustion of fuels. The single largest source of CO is motor vehicle engines; the highest emissions occur during low travel speeds, stop-and-go driving, cold starts, and hard acceleration. Exposure to high concentrations of CO reduces the oxygen-carrying capacity of the blood and can cause headaches, nausea, dizziness, and fatigue; impair central nervous system function; and induce angina (chest pain) in persons with serious heart disease. Very high levels of CO can be fatal.

Particulate Matter

PM_{10} and $PM_{2.5}$ consist of particulate matter that is 10 microns or less in diameter and 2.5 microns or less in diameter, respectively (a micron is one-millionth of a meter). PM_{10} and $PM_{2.5}$ represent fractions of particulate matter that can be inhaled into the air passages and the lungs and can cause adverse health effects. Major pollutant sources of PM_{10} include: dust and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-

raised dust and ocean sprays). Major pollutant sources of $PM_{2.5}$ include: fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; also, formed from photochemical reactions of other pollutants, including NO_X, SO_X, and organics. Some sources of particulate matter, such as wood burning in fireplaces, demolition, and construction activities, are more local; others, such as vehicular traffic, have a more regional effect.

Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health. Particulates also can damage materials and reduce visibility. Large dust particles (diameter greater than 10 microns) settle out rapidly and are easily filtered by human breathing passages. This large dust is of more concern as a soiling nuisance rather than a health hazard. The remaining fraction, PM_{10} and $PM_{2.5}$, are a health concern, particularly at levels above the federal and state ambient air quality standards. $PM_{2.5}$ (including diesel exhaust particles) has greater effects on health, because these particles are so small and can penetrate to the deepest parts of the lungs.

Scientific studies have suggested links between fine particulate matter and numerous health problems, including asthma, bronchitis, and acute and chronic respiratory symptoms, such as shortness of breath and painful breathing. Recent studies have shown an association between morbidity (ill health) and mortality and daily concentrations of particulate matter in the air. Children are more susceptible to the health risks of PM_{10} and $PM_{2.5}$ because their immune and respiratory systems are still developing.

Studies conducted since the 1990s have shown a statistically significant direct association between mortality (premature deaths) and daily concentrations of particulate matter in the air. Despite important gaps in scientific knowledge and continued reasons for some skepticism, a comprehensive evaluation of the research findings provides persuasive evidence that exposure to fine particulate air pollution has adverse effects on cardiopulmonary health.

Nitrogen Dioxide

NO_2 is a reddish-brown gas that is a byproduct of combustion processes. Automobiles and industrial operations are the main sources of NO_2. Aside from its contribution to ozone formation, NO_2 can increase the risk of acute and chronic respiratory disease and reduce visibility. NO_2 may be visible as a coloring component on high-pollution days, especially in conjunction with high ozone levels.

Sulfur Dioxide

SO_2 is a combustion product of sulfur or sulfur-containing fuels such as coal and diesel. SO_2 is also a precursor to the formation of particulate matter, atmospheric sulfate, and atmospheric sulfuric acid formation that could precipitate downwind as acid rain.

Lead

Leaded gasoline (phased out in the United States beginning in 1973), lead-based paint (on older houses and cars), smelters (metal refineries), and the manufacture of lead storage batteries have been the primary sources of lead released into the atmosphere. Lead has a range of adverse neurotoxic health effects, which puts children at special

risk. Some lead-containing chemicals cause cancer in animals. Lead levels in the air have decreased substantially since leaded gasoline was eliminated. Ambient lead concentrations are monitored only on an as-warranted, site-specific basis in California.

Non-criteria Air Pollutants Covered under the California Ambient Air Quality Standards

Hydrogen Sulfide

Hydrogen sulfide is a colorless gas with the odor of rotten eggs. The most common sources of hydrogen sulfide emissions are oil and natural gas extraction and processing, and natural emissions from geothermal fields. It is also formed during bacterial decomposition of human and animal wastes, and is present in emissions from sewage treatment facilities and landfills. Hydrogen sulfide has an extremely strong and foul odor that can induce tearing of the eyes and symptoms related to overstimulation of the sense of smell, including headache, nausea, or vomiting.

Sulfates

Sulfates are a family of chemicals that contain the fully oxidized ionic form of sulfur, in combination with metal and/or hydrogen ions. In California, sulfur-containing compounds are emitted primarily during the combustion of petroleum-derived fuels (e.g., gasoline and diesel fuel) that contain sulfur. Because sulfate particles are part of $PM_{2.5}$, they have health effects similar to those from exposure to $PM_{2.5}$.

Visibility-Reducing Particles

Particulate matter pollution affects the environment by decreasing visibility (causing haze). These particles vary greatly in shape, size, and chemical composition, and come from a variety of natural and manmade sources. Some haze-causing particles, such as windblown dust and soot, are emitted directly to the air. Others are formed in the air from the chemical transformation of gaseous pollutants (e.g., sulfates, nitrates, organic carbon particles), which are the major constituents of fine particulate matter. These fine particles, caused largely by combustion of fuel, can travel hundreds of miles and impair visibility. Some haze-causing pollutants have been linked to serious health problems and are described in the *Particulate Matter* section above.

Vinyl Chloride

Vinyl chloride (chloroethene), a chlorinated hydrocarbon, is a colorless gas with a mild, sweet odor. Most vinyl chloride is used in the process of making polyvinyl chloride plastic and vinyl products, and thus is emitted from industrial processes. Exposure to vinyl chloride is primarily an occupational concern. Short-term exposure to high levels (10 parts per million [ppm] or above) of vinyl chloride in air causes central nervous system effects, such as dizziness, drowsiness, and headaches. The primary non-cancer health effect of long-term exposure to vinyl chloride through inhalation or oral exposure is liver damage. Inhalation exposure to vinyl chloride increases the risk of angiosarcoma, a rare form of liver cancer in humans.

Toxic Air Contaminants

Non-criteria air pollutants or toxic air contaminants (TACs) are airborne substances that can cause short-term (acute) and/or long-term (chronic or carcinogenic, i.e., cancer-

causing) adverse human health effects (i.e., injury or illness). TACs include both organic and inorganic chemical substances. They are emitted from a variety of common sources, including gasoline stations, automobiles, diesel engines, dry cleaners, industrial operations, and painting operations. TACs are regulated differently from CAPs at both the federal and state levels. At the federal level, these airborne substances are referred to as hazardous air pollutants (HAPs). The state list of TACs identifies 243 substances (ARB 2020b), and the federal list of HAPs identifies 187 substances (EPA 2020).

The California Air Resources Board (CARB) identified diesel particulate matter (DPM) as a TAC in 1998, based primarily on evidence demonstrating cancer effects in humans. The exhaust from diesel engines includes hundreds of different gaseous and particulate components, many of which are toxic. Mobile sources such as trucks and buses are among the primary sources of diesel emissions, and concentrations of DPM are higher near heavily traveled highways and rail lines with diesel locomotive operations. The cancer risk from DPM as determined by CARB declined from 750 in one million in 1990 to 570 in one million in 1995; by 2000, CARB estimated the average statewide cancer risk from DPM at 540 in one million. This calculated cancer risk value from ambient air exposure can be compared against the lifetime probability of being diagnosed with cancer in the United States, from all causes, which is approximately 38.5 percent according to the National Cancer Institute (CARB 2020b).

Another notable TAC is asbestos, a fibrous mineral that is both naturally occurring in ultramafic rock (a rock type commonly found in California) and used as a processed component of building materials. Because asbestos has been proven to cause serious adverse health effects, including asbestosis and lung cancer, it is strictly regulated based on its natural widespread occurrence and its use as a building material.

Odorous Emissions

Odors are generally regarded as an annoyance rather than a health hazard. Manifestations of a person’s reaction to odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache). The occurrence and severity of odor impacts depend on the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of the receptors. Odor impacts should be considered for any proposed new odor sources located near existing receptors, as well as any new sensitive receptors located near existing odor sources. Generally, increasing the distance between the receptor and the odor source will mitigate odor impacts.

Attainment Area Designations

Attainment Area Designations

The CAA and the California Clean Air Act (CCAA) require all areas of California to be classified as attainment, non-attainment, or unclassified as to their status with regard to the national ambient air quality standards (NAAQS) and California ambient air quality standards (CAAQS). Under the CAA and the CCAA, CARB designates portions of the state based on air quality monitoring data. Section 3.4.3, *Regulatory Setting*, includes a more detailed discussion of these federal and state standards.

Table 3.4-2 shows the federal and state non-attainment status for the air basins in the study area for criteria pollutants. For this assessment, an air basin was considered non-attainment if any portion of the basin is designated non-attainment even if whole or portions of counties are in attainment or unclassified. Because of the differences between the NAAQS and CAAQS, the designation of non-attainment areas is different under the federal and state legislation.

Table 3.4-2
Federal and State Non-attainment Status for Air Basins in the Study Area

Air Basin	Federal Non-attainment Designations—NAAQS	State Non-attainment Designations—CAAQS
Great Basin Valleys	PM_{10} (Mono Basin, Mammoth Lakes, Owens Valley)	Ozone, PM_{10}
Lake County	Not Applicable	
Lake Tahoe	Not Applicable	PM_{10}
Mojave Desert	Ozone (Antelope Valley and Western Mojave Desert), PM_{10}	Ozone, PM_{10}, hydrogen sulfide (Searles Valley)
Mountain Counties	Ozone, $PM_{2.5}$	Ozone, $PM_{2.5}$ (Portola Valley), PM_{10}
North Central Coast	Not Applicable	Ozone (Non-attainment–Transitional), PM_{10}
North Coast	Not Applicable	PM_{10}
Northeast Plateau	Not Applicable	
Sacramento Valley	Ozone, $PM_{2.5}$	Ozone, $PM_{2.5}$, PM_{10}
Salton Sea	Ozone, PM_{10}, $PM_{2.5}$	Ozone, PM_{10}
San Diego	Ozone	Ozone, $PM_{2.5}$, PM_{10}
San Francisco Bay Area	Ozone, $PM_{2.5}$	Ozone, $PM_{2.5}$, PM_{10}
San Joaquin Valley	Ozone, $PM_{2.5}$	Ozone, $PM_{2.5}$, PM_{10}
South Central Coast	Ozone	Ozone, PM_{10}
South Coast	Ozone, $PM_{2.5}$, Lead	Ozone, $PM_{2.5}$, PM_{10}, NO (State Route 60 portion)

SOURCE: CARB 2020a.

NOTES: CAAQS = California ambient air quality standards; NAAQS = national ambient air quality standards; NO_X = oxides of nitrogen; $PM_{2.5}$ = particulate matter 2.5 microns or less in diameter; PM_{10} = particulate matter 10 microns or less in diameter

Sensitive Receptors

Given the geographical range of the study area and the variety of land uses present, this section describes sensitive receptors at a high level. A specific discussion of sensitive receptors would require knowledge of the local land uses near the restoration projects permitted under the Order.

Air quality does not affect every individual or group in the population in the same way, and some groups are more sensitive than others to adverse health effects caused by exposure to air pollutants. Population subgroups sensitive to the health effects of air pollutants include the elderly and the young, those with higher rates of respiratory disease such as asthma and chronic obstructive pulmonary disease, and those with other environmental or occupational health exposures (e.g., indoor air quality) that affect cardiovascular or respiratory diseases. Land uses such as schools, children's day care centers, hospitals, and nursing and convalescent homes are more sensitive than the general public to poor air quality because the population groups associated with these uses have increased susceptibility to respiratory distress. Parks and playgrounds are considered moderately sensitive to poor air quality because persons engaged in strenuous work or exercise also have increased sensitivity to poor air quality; however, exposure times are generally far shorter in parks and playgrounds than in residential locations and schools, which typically reduces overall exposure to pollutants. Residential areas are more sensitive to air quality conditions than commercial and industrial areas because people generally spend longer periods of time at their residences, with associated greater exposure to ambient air quality conditions. Workers are not considered sensitive receptors because all employers must follow regulations set forth by the U.S. Occupational Safety and Health Administration to ensure the health and well-being of their employees.

The study area spans urbanized areas, rural areas, as well as parks and open space. In urbanized areas, sensitive receptors include schools, day care centers, residences, nursing homes, hospitals, and parks. In rural areas, the primary sensitive receptor would be rural residences.

Toxic Air Contaminants

The study area spans a variety of land uses that include sources of TACs, such as gas stations, automobile traffic, diesel engines, railways, dry cleaners, asbestos, industrial operations, and painting operations.

Odors

Odor-generating uses that may be present in the study area include wastewater treatment plants; landfills; chemical plants; decaying material in waterlogged areas; anaerobic decomposition of organic materials; and agricultural sources such as dairy and poultry farms, pesticide, fertilizer, and herbicide application, and rendering plants.

Greenhouse Gases

Certain gases in the earth's atmosphere, classified as GHGs, play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space. A portion of the radiation is absorbed by the earth's surface,

and a smaller portion of this radiation is reflected back toward space. This absorbed radiation is then emitted from the earth as low-frequency infrared radiation. The frequencies at which bodies emit radiation are proportional to temperature. The earth has a much lower temperature than the sun; therefore, the earth emits lower frequency radiation. Most solar radiation passes through GHGs; however, infrared radiation is absorbed by these gases. As a result, radiation that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate on earth.

Prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO_2), methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Human-caused emissions of these GHGs in excess of natural ambient concentrations are responsible for intensifying the greenhouse effect and leading to a trend of unnatural warming of the earth's climate, known as global climate change or global warming. GHG emissions contributing to global climate change are attributable, in large part, to human activities: on-road and off-road transportation, industrial/manufacturing, electricity generation by utilities and consumption by end users, residential and commercial on-site fuel usage, and agriculture and forestry. CO_2 emissions are largely byproducts of fossil fuel combustion. Methane, a highly potent GHG, results primarily from off-gassing (the release of chemicals from nonmetallic substances under ambient or greater pressure conditions), largely from agricultural practices and landfills. Nitrous oxide emissions are also largely attributable to agricultural practices and soil management.

Gases with high global warming potential have atmospheric insulative properties that are hundreds to tens of thousands of times greater than that of CO_2. Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are some of the most common types of high global warming potential gases and result from a variety of industrial processes. Hydrofluorocarbons and perfluorocarbons are used as refrigerants and can be emitted through evaporation and leakage. Sulfur hexafluoride is a powerful electrical insulator used in power transmission and semiconductor manufacturing and is emitted through evaporation and leakage into the atmosphere.

According to the Intergovernmental Panel on Climate Change (IPCC), "It is extremely likely that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the anthropogenic increase in GHG concentrations and other anthropogenic forcings together" (IPCC 2014:5). Climate change is a global problem. GHGs are global pollutants, unlike CAPs and TACs, which are pollutants of regional and local concern.

Whereas pollutants with localized air quality effects have relatively short atmospheric lifetimes (about 1 day), GHGs have long atmospheric lifetimes (one to several thousand years). GHGs persist in the atmosphere for long enough time periods to be dispersed around the globe. Although the lifetime of any particular GHG molecule is dependent on multiple variables and cannot be determined with any certainty, it is understood that more CO_2 is emitted into the atmosphere than is sequestered by ocean uptake, vegetation, and other forms of sequestration. Of the total annual human-caused CO_2 emissions, approximately 55 percent is sequestered through ocean and land uptake

every year, averaged over the last 50 years, and the remaining 45 percent remains stored in the atmosphere (IPCC 2013:467).

The quantity of GHGs in the atmosphere that ultimately result in climate change is not precisely known, but is enormous; no single project alone would measurably contribute to an incremental change in the global average temperature, or to global, local, or micro climates. From the standpoint of CEQA, GHG impacts relative to global climate change are inherently cumulative. Chapter 5, *Cumulative Impacts*, includes a more detailed discussion of climate change.

Table 3.4-3 summarizes the most recent California statewide GHG emissions inventory. In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation for residential, commercial, and industrial use (CARB 2016).

Table 3.4-3
California Statewide Greenhouse Gas Emissions Inventory (2000–2017)

Emissions Sector	MMT CO_2e 2000	MMT CO_2e 2005	MMT CO_2e 2010	MMT CO_2e 2015	MMT CO_2e 2017	Percent of Total (2017)	Percent Change (2000–2017)
Transportation	180.3	189.1	165.1	166.2	169.9	40.1	-5.8
Electricity Generation[a]	104.8	107.9	90.3	83.8	62.4	14.7	-40.5
Industrial	97.4	95.9	91.5	91.5	89.4	21.1	-8.2
Commercial and Residential	44.0	43.1	45.9	38.8	41.1	9.7	-6.6
Agriculture	31.0	33.7	33.7	33.8	32.4	7.6	-4.5
High Global Warming Potential	6.3	9.3	13.5	18.6	19.9	4.7	+215.9
Recycling and Waste	7.3	7.8	8.4	8.7	8.9	2.1	+21.9
Total[b]	471.1	486.8	448.4	441.4	424.0	100	

SOURCE: CARB 2019

NOTES: MMT CO_2e = million metric tons of carbon dioxide equivalent

[a] Includes both in-state electricity generation and out-of-state imported electricity that is consumed in-state.

[b] Totals may not sum exactly due to rounding.

Carbon Sequestration

Carbon sequestration is the long-term storage of CO_2 that has been removed from the atmosphere and stored in a carbon reservoir (e.g., trees, vegetation, soil, and ocean). During these processes, CO_2 is absorbed from the atmosphere by trees and vegetation during photosynthesis. The CO_2 is then broken down and the carbon is stored (e.g., plant parts or soil), while the oxygen is released back into the atmosphere. Carbon sequestration plays an important role in preventing global climate change by reducing

greenhouse gas emissions and by preserving carbon "sinks" such as forests and wetlands. *An Inventory of Ecosystem Carbon in California's Natural & Working Lands* (CARB 2020c) provides an estimate of carbon sequestration in California. The inventory includes forest and other natural lands, urban land, cropland, soil carbon, and wetlands.

3.4.3 Regulatory Setting

This section discusses federal, state, and regional and local plans, policies, regulations, and laws, and ordinances pertaining to air quality and GHG emissions resources.

Future permitted restoration projects that would be implemented under the Order may be subject to the laws and regulations listed below, as well as other local or individual restoration projects requirements, depending on the project location.

Federal

Criteria Air Pollutants

EPA is in charge of implementing national air quality programs. EPA's air quality mandates are drawn primarily from the federal CAA, enacted in 1970. As required by the CAA, EPA has established primary and secondary NAAQS for the following criteria air pollutants: CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead. The primary standards protect public health and the secondary standards protect public welfare. Table 3.4-4 lists the current NAAQS, along with the current CAAQS that are discussed later in this section.

Table 3.4-4
Summary of Ambient Air Quality Standards

Pollutant	Averaging Time	State Standard	National Standard	Major Pollutant Sources
Ozone	1 hour	0.09 ppm	–	Formed when reactive organic gases and NO_X react in the presence of sunlight. Major sources include on-road motor vehicles, solvent evaporation, and commercial/industrial mobile equipment.
	8 hour	0.070 ppm	0.070 ppm	
Carbon Monoxide	1 hour	20 ppm	35 ppm	Internal combustion engines, primarily gasoline-powered motor vehicles.
	8 hour [a]	9 ppm	9 ppm	
Nitrogen Dioxide	1 hour	0.18 ppm	100 ppb	Motor vehicles, petroleum refining operations, industrial sources, aircraft, ships, and railroads.
	Annual Avg.	0.030 ppm	0.053 ppm	
Sulfur Dioxide	1 hour	0.25 ppm	75 ppb	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
	3 hour	–	0.5 ppm [b]	
	24 hour	0.04 ppm	0.14 ppm	
	Annual Avg.	–	0.030 ppm	

Table 3.4-4
Summary of Ambient Air Quality Standards

Pollutant	Averaging Time	State Standard	National Standard	Major Pollutant Sources
Respirable Particulate Matter (PM_{10})	24 hour	50 µg/m^3	150 µg/m^3	Dust and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
	Annual Avg.	20 µg/m^3	–	
Fine Particulate Matter ($PM_{2.5}$)	24 hour	–	35 µg/m^3	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; Also, formed from photochemical reactions of other pollutants, including NO_X, oxides of sulfur, and organics.
	Annual Avg.	12 µg/m^3	12.0 µg/m^3	
Lead	Monthly Ave.	1.5 µg/m^3	–	Present source: lead smelters, battery manufacturing and recycling facilities. Past source: combustion of leaded gasoline.
	Quarterly	–	1.5 µg/m^3	
Hydrogen Sulfide	1 hour	0.03 ppm	No National Standard	Geothermal power plants, petroleum production and refining.
Sulfates	24 hour	25 µg/m^3	No National Standard	Produced by the reaction in the air of SO_2.
Visibility-Reducing Particles	8 hour	Extinction of 0.23/km; visibility of 10 miles or more	No National Standard	See $PM_{2.5}$.
Vinyl Chloride	24 hour	0.01 ppm	No National Standard	Polyvinyl chloride and vinyl manufacturing.

SOURCES: CARB 2009, 2016.

NOTES: µg/m^3 = micrograms per cubic meter; km = kilometer; NO_X = oxides of nitrogen; ppb = parts per billion; ppm = parts per million; SO_2 = sulfur dioxide

[a] A more stringent 8-hour carbon monoxide state standard exists around Lake Tahoe (6 ppm).

[b] Secondary national standard.

The CAA also requires each state to prepare an air quality control plan, referred to as a state implementation plan (SIP), for areas that do not attain the NAAQS. Table 3.4-2 lists the NAAQS non-attainment status for air basins in the study area.

The federal CAA Amendments of 1990 added requirements for states with areas that are not in attainment of all NAAQSs 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 SIPs to determine whether they conform to the mandates of the CAA and its amendments, and whether implementation will achieve air quality goals. If EPA determines a SIP to be inadequate, a federal implementation plan that imposes additional control measures may be prepared for the non-attainment area. If an approvable SIP is not submitted or implemented within the mandated time frame, sanctions may be applied to transportation funding and permitting of stationary air pollution sources in the non-attainment air basin.

Toxic Air Contaminants

Air quality regulations also cover TACs, which federal agencies refer to as HAPs. In general, for TACs that 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. Instead, EPA and, in California, CARB, regulate HAPs and TACs, respectively, through statutes and regulations that generally require the use of the maximum available control technology or best available control technology for toxics to limit emissions.

Greenhouse Gases

EPA is the federal agency responsible for implementing the CAA and its amendments. The U.S. Supreme Court ruled on April 2, 2007, that CO_2 is an air pollutant as defined under the CAA, and that EPA has the authority to regulate emissions of GHGs. Based on the ruling in this case, EPA took steps to regulate GHG emissions and lent its support to state and local agencies' efforts to reduce GHG emissions.

Greenhouse Gas Permitting Requirements

The CAA requires that new major stationary emissions sources and major modifications at existing stationary sources obtain an air pollution permit before beginning construction. On May 13, 2010, EPA issued the Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule (EPA 2011). This final rule sets thresholds for GHG emissions that define when permits under the New Source Review Prevention of Significant Deterioration (PSD) and Title V Operating Permit programs are required for new and existing industrial facilities.

PSD permitting requirements now cover new construction projects that emit at least 100,000 tons (90,718 metric tons [MT]) of GHGs per year, even if they do not exceed the permitting thresholds for any other attainment pollutant. Modifications at existing facilities that increase GHG emissions by at least 75,000 tons (68,039 MT) per year are subject to PSD requirements, even if they do not significantly increase emissions of any other attainment pollutant. Title V Operating Permit requirements apply to sources based on their GHG emissions even if they would not apply based on emissions of any other pollutant. Facilities that emit at least 100,000 tons (90,718 MT) per year of carbon dioxide equivalent (CO_2e) are subject to Title V permitting requirements.

Mandatory Greenhouse Gas Reporting Rule

On September 22, 2009, EPA issued a final rule for mandatory reporting of GHGs from large GHG emissions sources in the United States. In general, this national reporting requirement provides EPA with accurate and timely GHG emissions data from facilities that emit 25,000 MT or more of CO_2e per year. These publicly available data allow the reporters to track their own emissions, compare them to similar facilities, and aid in identifying cost-effective opportunities to reduce emissions in the future. Reporting is conducted at the facility level, except that certain suppliers of fossil fuels and industrial GHGs along with vehicle and engine manufacturers report at the corporate level. An estimated 85 percent of the total U.S. GHG emissions, from approximately 10,000 facilities, are covered by this final rule.

State

Criteria Air Pollutants

CARB is the agency responsible for coordination and oversight of state and local air pollution control programs in California, and for implementing the CCAA. The CCAA, adopted in 1988, required the CARB to establish CAAQS. CARB has established CAAQS, as shown in Table 3.4-4 above, for sulfates, hydrogen sulfide, vinyl chloride, visibility-reducing particulate matter, and the above-mentioned federal criteria air pollutants.

Table 3.4-2 lists the CAAQS non-attainment status for air basins in the study area. 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 date practical. The act specifies that local air districts should focus attention on reducing the emissions from transportation and area-wide emission sources, and provides air districts with the authority to regulate indirect sources.

Toxic Air Contaminants/Hazardous Air Pollutants

TACs in California are regulated primarily through the Tanner Air Toxics Act (Assembly Bill [AB] 1807, Chapter 1047, Statutes of 1983) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588, Chapter 1252, Statutes of 1987). AB 1807 established a formal procedure for CARB to designate substances as TACs. Research, public participation, and scientific peer review are required before CARB can designate a substance as a TAC. To date, CARB has identified more than 21 TACs and adopted EPA's list of HAPs as TACs. Most recently, particulate matter exhaust from diesel engines (DPM) was added to CARB's list of TACs.

Once a TAC is identified, CARB adopts an airborne toxics control measure for sources that emit that particular TAC. If a safe threshold exists for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If no safe threshold exists, the measure must incorporate best available control technology for toxics to minimize emissions.

CARB has adopted diesel exhaust control measures and more stringent emissions standards for various transportation-related mobile sources of emissions, including transit buses, and off-road diesel equipment (e.g., tractors, generators). Over time, replacing older vehicles will result in a vehicle fleet that produces substantially lower levels of TACs than under current conditions. Mobile-source emissions of TACs (e.g., benzene, 1-3-butadiene, DPM) 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/Clean Fuels and Phase II reformulated gasoline regulations) and control technologies. With implementation of CARB's Risk Reduction Plan (CARB 2000), it is expected that DPM concentrations will be 85 percent less in 2020 than in the year 2000. Adopted regulations are also expected to reduce formaldehyde emissions from cars and light-duty trucks. As emissions are reduced, the risks from exposure to the emissions should also be reduced.

Greenhouse Gas Emissions

Executive Order S-3-05

Executive Order S-3-05, signed by Governor Arnold Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra Nevada snowpack, exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those problems, the executive order established targets for the state's total GHG emissions: reduce emissions to the 2000 level by 2010, to the 1990 level by 2020, and to 80 percent below the 1990 level by 2050.

Executive Order B-30-15

On April 20, 2015, Governor Edmund G. Brown Jr. signed Executive Order B-30-15, which established a GHG emissions reduction target for California of 40 percent below the 1990 level by 2030. The executive order aligns California's GHG emissions reduction targets with those of leading international governments such as the 28-nation European Union, which adopted the same target in October 2014. The California Global Warming Solutions Act of 2006 (AB 32, discussed below) established the target of reducing GHG emissions to the 1990 level (431 MMT CO_2e) by 2020. This goal was achieved 4 years early in 2016 (CalEPA 2018).

Meeting California's emissions reduction target for 2030, emissions 40 percent below the 1990 level, will make it possible to reach the ultimate goal of reducing emissions to 80 percent below the 1990 level by 2050. This is in line with the scientifically established levels needed in the U.S. to limit global warming below 2 degrees Celsius (°C)—the warming threshold at which there will likely be major climate disruptions such as super droughts and rising sea levels, according to scientific consensus.

Assembly Bill 32, the California Global Warming Solutions Act of 2006

In September 2006, Governor Schwarzenegger signed AB 32, which established regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and a cap on statewide GHG emissions. AB 32 required that statewide GHG emissions be reduced to 1990 levels by 2020. AB 32 also requires that these

reductions “shall remain in effect unless otherwise amended or repealed,” further stating the following (Health and Safety Code Section 38551):

> *(b) It is the intent of the Legislature that the statewide greenhouse gas emissions limit continue in existence and be used to maintain and continue reductions in emissions of greenhouse gases beyond 2020.*
>
> *(c) The state board [California Air Resources Board] shall make recommendations to the Governor and the Legislature on how to continue reductions of greenhouse gas emissions beyond 2020.*

In 2017 CARB released California’s 2017 Climate Change Scoping Plan which included recommendations to maintain and continue reductions beyond 2020 (ARB 2017). AB 32 requires CARB to update the Scoping Plan at least every 5 years.

Assembly Bill 32 Climate Change Scoping Plan and Updates

In December 2008, CARB adopted its Climate Change Scoping Plan, which contains the main strategies California will implement to reduce CO_2e emissions by approximately 118 million metric tons (MMT), or approximately 21.7 percent from the state’s projected 2020 emissions level of 545 MMT CO_2e under a business-as-usual scenario. (This is a reduction of 47 MMT CO_2e, or almost 10 percent, from 2008 emissions.)

CARB released the First Update to the Climate Change Scoping Plan in May 2014 and subsequently adopted the plan, which identifies the next steps to reaching the goals of AB 32 and evaluates the progress that was made between 2000 and 2012 (CARB 2014). The update stated that California was on track to meet the near-term 2020 GHG limit and is well positioned to maintain and continue reductions beyond 2020 (CARB 2014). The update also reported trends in GHG emissions from various emissions sectors (e.g., transportation, building energy, agriculture).

On December 14, 2017, CARB adopted the 2017 Climate Change Scoping Plan (2017 Scoping Plan) (CARB 2017), which presents the framework for achieving the 2030 reductions established in more recent legislation. The 2017 Scoping Plan identifies the GHG reductions needed by each emissions sector to achieve a statewide emissions level before 2030 that is 40 percent below the 1990 level.

The 2017 Scoping Plan also identifies how GHGs from proposed projects could be evaluated under CEQA. Specifically, it states that achieving “no net increase” in GHG emissions is the correct overall objective for projects evaluated under CEQA if the projects cannot be shown to conform with applicable local GHG reduction plans. CARB recognizes that it may not be appropriate or feasible for every development project to mitigate its GHG emissions to no net increase, and that this may not necessarily imply a substantial contribution to the cumulatively significant environmental impact of climate change.

Senate Bill 375

Senate Bill (SB) 375, signed by Governor Schwarzenegger in September 2008, aligns regional transportation planning efforts, regional GHG emissions reduction targets, and land use and housing allocation. SB 375 requires metropolitan planning organizations

(MPOs) to adopt a sustainable communities strategy (SCS) or alternative planning strategy, showing prescribed land use allocation in each MPO's regional transportation plan. CARB, in consultation with the MPOs, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in their respective regions for 2020 and 2035.

Senate Bill X1-2, the California Renewable Energy Resources Act of 2011

SB X1-2 (2011) requires all California utilities to generate 33 percent of their electricity from renewables by the end of 2020. SB X1-2 set a three-stage compliance period requiring all California utilities, including independently owned utilities, energy service providers, and community choice aggregators, to generate 20 percent of their electricity from renewables by December 31, 2013; 25 percent by December 31, 2016; and 33 percent by December 31, 2020.

SB X1-2 also requires that the renewable electricity standard be met increasingly with renewable energy supplied to California's grid from sources in or near California. SB X1-2 specified that renewables from these sources must make up at least 50 percent of total renewable energy for the 2011–2013 compliance period, at least 65 percent for the 2014–2016 compliance period, and at least 75 percent for 2016 and beyond.

Senate Bill 350, the Clean Energy and Pollution Reduction Act of 2015

SB 350 requires the California Public Utilities Commission (CPUC) to focus its energy procurement decisions on reducing GHG emissions by 40 percent by 2030, including through efforts to procure at least 50 percent renewable energy, double energy efficiency, and promote electrification of transportation.

Senate Bill 100, California Renewables Portfolio Standard Program: Emissions of Greenhouse Gases

SB 100 requires that California's renewable-energy and zero-carbon resources supply 100 percent of electric retail sales to end-use customers, and 100 percent of the electricity procured for state agencies, by December 31, 2045. The policy specifies that the transition to a zero-carbon electric system must not cause or contribute to increases of GHG emissions elsewhere in the western electricity grid.

SB 100 also requires the California Energy Commission (CEC), CPUC, and CARB to complete a joint agency report to the Legislature evaluating the 100 percent zero-carbon electricity policy. The report will be developed using a public process and qualitative and quantitative analyses to address the requirements and intent of the statute.

In consultation with all California balancing authorities and as part of a public process, the three agencies will issue a report to the Legislature by January 1, 2021, and at least every 4 years afterward. The joint report will include:

- A review of the 100 percent zero-carbon policy focused on technologies, forecasts, then-existing transmission, and the maintenance of safety, environmental and public safety protection, affordability, and system and local reliability.
- An evaluation identifying the potential benefits and impacts of achieving the policy on system and local reliability.

- An evaluation of the nature of any anticipated financial costs and benefits to electric, gas, and water utilities, including customer rate impacts and benefits.
- The barriers to, and benefits of, achieving the policy.
- Alternative scenarios in which the policy can be achieved and the estimated costs and benefits of each scenario.

Senate Bill 32 and Assembly Bill 197 (2016)

In August 2016, Governor Brown signed SB 32 and AB 197, which extended California's GHG emissions reduction programs beyond 2020. SB 32 amended the Health and Safety Code to include Section 38566, which contains language authorizing CARB to achieve a statewide GHG emissions reduction of at least 40 percent below the 1990 level by no later than December 31, 2030. SB 32 codified the targets established by Executive Order B-30-15 for 2030, which set the next interim step in the state's continuing efforts to pursue the long-term target expressed in Executive Orders S-3-05 and B-30-15 of 80 percent below the 1990 emissions level by 2050.

Regional and Local

The study area encompasses multiple counties, cities, and air districts throughout California. Each county, city, and air district has local regulations, an air quality management plan (AQMP), a general plan, and in some cases a climate action plan, containing goals and policies to improve air quality and address community health and sustainability. Counties and cities may set community GHG emissions reduction targets, require best management practices to reduce emissions of air pollutants such as fugitive dust, and reinforce local air district recommendations.

3.4.4 Impacts and Mitigation Measures

Methods of Analysis

Air quality and GHG emissions impacts from the types of restoration projects permitted under the Order are evaluated in terms of how typical construction and operation of project components could emit criteria air pollutants and precursors, odors, TACs, and GHGs. However, the precise locations and detailed characteristics of potential future individual restoration projects are yet to be determined. Therefore, this air quality and GHG emissions analysis focuses on reasonably foreseeable changes from implementation of the types of projects and actions that might be taken in the future consistent with the level of detail appropriate for a program-level analysis.

Permanent impacts are those that would continue through the life of a project as a result of the environmental conditions caused by restoration projects permitted under the Order (e.g., new infrastructure such as fish screens that would require routine maintenance and cleaning of fish screens and removal of debris and sediment from stream crossings). Temporary impacts are considered those that would be temporary in nature (e.g., construction-related activities).

The approach to assessing air quality and GHG emissions impacts was to identify and review existing environmental studies, data, model results, and other information for projects that are consistent with those identified in Section 2.6, *Categories of*

Restoration Projects in the Order, and Section 2.7, *Typical Construction, Operation, and Maintenance Activities and Methods*.

Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, an air quality– or GHG emissions–related impact is considered significant if the types of projects that would be permitted under the Order would do any of the following:

- Conflict with or obstruct implementation of the applicable air quality plan
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard
- Expose sensitive receptors to substantial pollutant concentrations
- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people
- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs

Appendix G of the State CEQA Guidelines further indicates that, where available, the thresholds of significance established by the applicable air district may be relied upon to make the significance determinations. If the applicable air district has not established specific thresholds, then the thresholds of neighboring air districts or emissions limits used for stationary-source permitting may be used.

Impacts and Mitigation Measures

Table 3.4-5 summarizes the impact conclusions presented in this section for easy reference.

As part of the State Water Board or Regional Board's issuance of a NOA for a restoration project under the Order, compliance with the general protection measures and mitigation measures listed below would be required when applicable to a given project. Not all general protection measures and mitigation measures would apply to all restoration projects. The applicability of the general protection measures and mitigation measures would depend on the individual restoration activities, project location, and the potentially significant impacts of the individual restoration project. Implementation of the mitigation measures would be the responsibility of the project proponent(s) under the jurisdiction of the State Water Board, appropriate Regional Board, or other authorizing regulatory agency.

Table 3.4-5
Summary of Impact Conclusions—Air Quality and Greenhouse Gas Emissions

Impact Statement	Construction Activities	Constructed Facilities and Operations and Maintenance
3.4-1: Implementing future restoration projects permitted under the Order could conflict with an applicable air quality plan.	SU	LTS
3.4-2: Emissions from future restoration projects permitted under the Order could result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard.	SU	LTS
3.4-3: Emissions from future restoration projects permitted under the Order could result in other emissions (such as those leading to odors) that would adversely affect a substantial number of people.	LTS	LTS
3.4-4: Emissions from future restoration projects permitted under the Order could expose sensitive receptors to substantial pollutant concentrations.	SU	LTS
3.4-5: Implementing future restoration projects permitted under the Order could result in an increase in GHG emissions that may have a significant impact on the environment.	SU	LTS
3.4-6: Implementing future restoration projects permitted under the Order could conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing emissions of GHGs.	SU	LTS

SOURCE: Data compiled by Environmental Science Associates in 2019 and 2020
NOTES: LTS = less than significant; SU = significant and unavoidable

Impact 3.4-1: Implementing future restoration projects permitted under the Order could conflict with an applicable air quality plan.

As described in Section 3.4.3, *Regulatory Setting*, most of the air districts in the study area have one or more air quality management plans that include control measures, rules, and regulations to bring air districts into attainment for certain criteria air pollutants.

Effects of Project Construction Activities

Construction activities permitted under the Order would include construction of culverts, bridges, fish screens, ladders, and pilings; removal of small dams, tide gates, flood

gates, and legacy structures; placement of bioengineered stabilization materials; grading and excavation to reconnect, set back, or breach levees; reconnection of stream and river channels; creation of depressions, berms, and drainage features; and installation of cofferdams during construction. These activities could require the use of mobile diesel-powered construction equipment such as excavators, graders, scrapers, bulldozers, and backhoes. For example, haul trucks would be used to move borrow and/or spoils and other materials and would emit pollutants. ROG, NO_X, PM_{10}, $PM_{2.5}$, CO, and CO_2 would be emitted during the combustion of fuels in construction equipment and material transport trucks.

It is reasonable to assume that the construction of projects would comply with the control measures, rules, and regulations stated in the AQMPs of local air districts. For example, analysis of a project designed to restore the natural geomorphic processes and ecological functions at a marsh could find that the generation of construction-related emissions of ROG, NO_X, and PM_{10} would not violate or contribute substantially to an existing or projected air quality violation.

AQMPs set forth rules, regulations, and control measures to bring an air district into attainment for certain criteria pollutants. If a project would substantially contribute to pollutant concentrations that exceed the NAAQS and CAAQS, it may also conflict with the local AQMP. As discussed for Impact 3.4-2 below, emissions from construction activities permitted under the Order could violate an air quality standard; contribute substantially to an air quality violation; and/or result in a short-term cumulatively considerable net increase in pollutants for which the region is non-attainment. Therefore, it is possible that construction activities for restoration projects permitted under the Order could conflict with an applicable air quality plan.

The specific locations and emissions of possible construction activities are not known at this time. Therefore, the potential for a conflict between a given restoration project permitted under the Order and an applicable air quality plan cannot be determined. Factors necessary to identify specific impacts include the location and size of the project, construction characteristics, attainment status of the local air basin or basins, and the applicable AQMPs of the local air quality district. Because air pollutant emissions from restoration projects permitted under the Order could conflict with applicable air quality plans, this impact would be **potentially significant**.

Projects implementing applicable general protection measures (see Appendix E) included in the Order would further reduce impacts to air quality and greenhouse gas emissions. The following general protection measures may apply to air quality and greenhouse gas emissions:

- GPM-8: Work Area and Speed Limits
- GPM-17: Fugitive Dust Reduction

Integration of these general protection measures into project designs and plans would reduce the impact of air pollutant emissions from project construction activities, but not to a less-than-significant level. This impact would be **potentially significant**.

As part of the State Water Board or Regional Board's issuance of a NOA for a restoration project under the Order, compliance with Mitigation Measure AIR-1 would be required when applicable to a given project. Implementation of this mitigation measure would be the responsibility of the project proponent(s) under the jurisdiction of the State Water Board, appropriate Regional Board, or other authorizing regulatory agency.

Mitigation Measure AIR-1: Minimize Conflicts with Applicable Air Quality Plans

Proponents of restoration projects permitted under the Order and their construction contractors shall implement the following measures to minimize conflicts between project construction and applicable air quality plans:

- Use equipment and vehicles that comply with CARB requirements and emission standards for on-road and off-road fleets and engines. New engines and retrofit control systems should reduce NO_X and PM emissions from diesel-fueled on-road and off-road vehicles and equipment.
- Minimize idling times, either by shutting equipment off when not in use or by reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure, Title 13, Section 2485 of the California Code of Regulations). Clear signage should be posted for construction workers at all entrances to the site.
- Maintain all equipment in proper working condition according to the manufacturer's specifications.
- Use electric equipment when possible. Use lower emitting alternative fuels to power vehicles and equipment where feasible.
- Use low–volatile organic compound (VOC) coatings and chemicals; minimize chemical use.

Mitigation measures for individual restoration projects would also include recommendations or requirements of the local air district(s). Project proponents would coordinate with local air district(s) regarding project-specific mitigation and implement applicable measures during construction. For example, the Bay Area Air Quality Management District (BAAQMD) lists basic and additional mitigation measures to reduce emissions from project construction (BAAQMD 2010, 2017). The following basic construction mitigation measures are recommended for restoration projects permitted under the Order:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 miles per hour (mph).

- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- Post a publicly visible sign with the telephone number and person at the lead agency to contact regarding dust complaints. This person shall respond and take corrective action within 48 hours. The air district's phone number shall also be visible to ensure compliance with applicable regulations.

The following additional construction mitigation measures are recommended for projects with construction emissions above the threshold determined for the local AQMP:

- All exposed surfaces shall be watered at a frequency adequate to maintain minimum soil moisture of 12 percent. Moisture content can be verified by lab samples or moisture probe.
- All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph.
- Wind breaks (e.g., trees, fences) shall be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50 percent air porosity.
- Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established.
- The simultaneous occurrence of excavation, grading, and ground-disturbing construction activities on the same area at any one time shall be limited. Activities shall be phased to reduce the amount of disturbed surfaces at any one time.
- Site accesses to a distance of 100 feet from the paved road shall be treated with a 6- to 12-inch compacted layer of wood chips, mulch, or gravel.
- Erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than 1 percent.
- The idling time of diesel-powered construction equipment shall be minimized to 2 minutes.
- The project shall develop a plan demonstrating that the off-road equipment (more than 50 horsepower) to be used in the construction project (i.e., owned, leased, and subcontractor vehicles) would achieve a project-wide fleet-average 20 percent NO_X reduction and 45 percent PM reduction compared to the most recent CARB fleet average. Acceptable options for reducing emissions include the use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, add-on devices such as particulate filters, and/or other options as such become available.

- The project shall use low-VOC (i.e., ROG) coatings beyond local requirements (i.e., Regulation 8, Rule 3: Architectural Coatings).
- All construction equipment, diesel trucks, and generators shall be equipped with best available control technology for emission reductions of NO_X and PM.
- All contractors shall use equipment that meets CARB's most recent certification standard for off-road heavy-duty diesel engines.

Mitigation Measure AIR-1 would be implemented to reduce the impacts of restoration projects permitted under the Order. However, because the extent and location of such actions are not known at this time, it is not possible to conclude that the mitigation measure, or equally effective mitigation measures, would reduce significant impacts to a less-than-significant level in all cases. Therefore, this impact would be **significant and unavoidable**.

Effects of Constructed Facilities (Natural or Artificial Infrastructure) and Operations and Maintenance of those Facilities

Restoration projects permitted under the Order could require periodic and routine maintenance. For example, operations and maintenance (O&M) necessary to support the functionality of constructed infrastructure may include maintenance and cleaning of fish screens, removal of debris and sediment from stream crossings, and O&M of fishways, which would produce air pollutant emissions from the use of equipment and vehicles that could conflict with applicable air quality plans. Emissions-generating activities would be similar to those described for the construction of restoration projects; however, the level of activity would be less intense and less frequent in the operational phase than during construction. Therefore, it is anticipated that emissions from restoration projects permitted under the Order would not violate an air quality standard, contribute substantially to an air quality violation, or result in a short-term cumulatively considerable net increase of non-attainment pollutants. Therefore, this impact would be **less than significant**.

The general protection measures listed above for project construction would be followed to further reduce the impacts of ground-disturbing activities for restoration projects permitted under the Order related to work area and speed limits and dust suppression.

Integration of these general protection measures into project designs and plans would continue to reduce the **less-than-significant** impacts of constructed facilities related to a conflict with an applicable air quality plan.

Impact 3.4-2: Emissions from future restoration projects permitted under the Order could result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard.

Construction activities from restoration projects permitted under the Order could be located in one or more air basins. Most of these air basins have established numeric thresholds for construction-generated emissions of criteria air pollutants and precursors,

indicating when emissions are significant at the project level and when emissions are cumulatively considerable.

Effects of Project Construction Activities

Construction activities for restoration projects permitted under the Order could require the use of diesel-powered construction equipment such as excavators, graders, scrapers, bulldozers, and backhoes. Haul trucks would be used to move borrow and/or spoils and other materials and would emit pollutants. ROG, NO_X, PM_{10}, $PM_{2.5}$, CO, and CO_2 would be emitted during the combustion of fuels in construction equipment and material transport trucks. Construction of restoration projects would emit fugitive PM_{10} and $PM_{2.5}$ dust, primarily during earthmoving activities. Other sources of fugitive dust would include vehicle travel on paved and unpaved roads, creation and management of borrow sites, concrete batch plants, and material handling, storage, and transport.

It is reasonable to expect that construction activities for restoration projects permitted under the Order may be intensive enough to result in substantial pollutant emissions. For example, floodplain restoration projects within the jurisdictional area of BAAQMD (e.g., including setting back, breaching, and removal of levees, berms, and dikes, and hydraulic reconnection and revegetation) may require the extensive use of heavy equipment and haul trips that would generate NO_X emissions in excess of BAAQMD's maximum daily threshold of 54 pounds per day, one of the more stringent thresholds in the study area.

Construction activities for restoration projects permitted under the Order could emit air pollutants. However, the specific locations and emissions of possible future facilities are not known at this time. Therefore, the potential for substantial construction-related emissions impacts cannot be determined. Factors necessary to identify site- or resource-specific impacts include the project's location, duration, and construction characteristics, and the thresholds of the local air quality district. Because the construction activities for restoration projects permitted under the Order could result in a cumulatively considerable net increase of a criteria pollutant for which a project region is in non-attainment status under an applicable federal or state ambient air quality standard, this impact would be **potentially significant**.

The general protection measures listed for Impact 3.4-1 would be followed to reduce the impacts of ground-disturbing activities for restoration projects permitted under the Order related to work area and speed limits and dust suppression.

As part of the State Water Board or Regional Board's issuance of a NOA for a restoration project under the Order, compliance with Mitigation Measure AIR-1 would be required when applicable to a given project. Implementation of this mitigation measure would be the responsibility of the project proponent(s) under the jurisdiction of the State Water Board, appropriate Regional Board, or other authorizing regulatory agency.

Mitigation Measure AIR-1 would be implemented to reduce the impacts of restoration projects permitted under the Order. However, because the extent and location of such actions are not known at this time, it is not possible to conclude that the mitigation measure, or equally effective mitigation measures, would reduce the significant impacts

of restoration projects constructed by other agencies to a less-than-significant level in all cases. Therefore, this impact would be **significant and unavoidable**.

Effects of Constructed Facilities (Natural or Artificial Infrastructure) and Operations and Maintenance of those Facilities

Restoration projects permitted under the Order could require periodic and routine maintenance. For example, O&M activities necessary to support the functionality of constructed infrastructure may include maintenance and cleaning of fish screens, removal of debris and sediment from stream crossings, and fishways O&M. These activities would produce air pollutant emissions that could result in a cumulatively considerable net increase of a criteria pollutant for which a project region is non-attainment under an applicable federal or state ambient air quality standard. Emissions-generating activities would be similar to those described for the construction of projects; however, the level of activity would be less intense and less frequent in the operational phase than during construction.

Routine O&M activities for restoration projects permitted under the Order would not be expected to result in a cumulatively considerable net increase of any criteria pollutant for which a project region is non-attainment under an applicable federal or state ambient air quality standard. Therefore, this impact would be **less than significant**.

The general protection measures listed for Impact 3.4-1 would be followed to further reduce the impacts of ground-disturbing O&M activities for restoration projects permitted under the Order related to work area and speed limits and dust suppression.

Integration of these general protection measures into project designs and plans would continue to reduce the **less-than-significant** impacts of constructed facilities related to the potential for a cumulatively considerable net increase of any criteria pollutant for which a project region is non-attainment under an applicable federal or state ambient air quality standard.

Impact 3.4-3: Emissions from future restoration projects permitted under the Order could result in other emissions (such as those leading to odors) that would adversely affect a substantial number of people.

The occurrence and severity of odor impacts depend on the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of receptors.

Effects of Project Construction Activities

Construction of restoration projects permitted under the Order could require the use of diesel-powered equipment and haul trucks such as excavators, graders, scrapers, bulldozers, and backhoes. Exhaust emissions from diesel equipment may generate odors. Haul trucks would move borrow and/or spoils and other materials and would emit exhaust. Odors may also be emitted during dredging and the placement of dredge spoils on adjacent lands for drying; if present, organic material could release gases, specifically hydrogen sulfide (H_2S), commonly described as having a foul or “rotten egg” smell.

Sources of construction-related emissions generally would not be in one location for long periods of time. The emissions would be intermittent and would dissipate from the

source rapidly over a short distance. For example, the analysis of a project designed to restore natural geomorphic processes and ecological functions at a marsh could find that the project would not result in any major sources of odors and that construction odors would be intermittent and short-term.

Construction activities for restoration projects permitted under the Order could temporarily generate odorous emissions. The specific locations and emissions of possible future projects are not currently known; therefore, the precise odor impacts cannot be identified at this time. Factors necessary to identify specific impacts include the project's location, construction characteristics, frequency and duration, and the location of sensitive receptors. However, given the temporary and intermittent nature of the impacts and the dissipation of odors, objectionable odors are unlikely to affect a substantial number of people. Impacts would be **less than significant**.

Projects implementing applicable general protection measures (see Appendix E) included in the Order would further reduce impacts to air quality and greenhouse gas emissions. The following general protection measures may apply to air quality and greenhouse gas emissions:

- IWW-13: Dredging Operations and Dredging Materials Reuse Plan

Integration of this general protection measure into project designs and plans would further reduce the **less-than-significant** impact related to other emissions (such as those leading to odors).

Effects of Constructed Facilities (Natural or Artificial Infrastructure) and Operations and Maintenance of those Facilities

Restoration projects constructed under the Order could require periodic and routine maintenance work, such as sediment removal within or near the facilities, vegetation removal, and inspection and maintenance of facilities. Odor-generating activities would be similar to those described for construction of projects; however, the level of activity would be less intensive in the operational phase than during construction. For example, repairing damage to a fish screen may require the use of heavy equipment that would create odorous diesel emissions, but the activity would not be as intense as during the initial construction of the fish screen.

In addition to maintenance activities, the operational characteristics of restoration projects permitted under the Order could generate odors. For example, floodplain restoration, including setting back, breaching, and removal of levees, berms, and dikes, and hydraulic reconnection and revegetation may increase the acreage that could be temporarily flooded, which could expose decomposing organic matter to the atmosphere and create objectionable odors. However, odorous emissions would be intermittent and dissipate from the source rapidly over a short distance. Thus, it is unlikely that projects would create objectionable odors affecting a substantial number of people.

Restoration projects permitted under the Order could temporarily generate odorous emissions. The specific locations and emissions of future facilities are not currently known; therefore, the precise odor impacts cannot be identified at this time. Factors necessary to identify specific impacts include the project's location, operational

characteristics, frequency and duration, and the location of sensitive receptors. However, given the temporary and intermittent nature of the impacts and the dissipation of odors, objectionable odors are unlikely to affect a substantial number of people. Impacts would be **less than significant**.

Projects implementing applicable general protection measures (see Appendix E) included in the Order would further reduce impacts to air quality and greenhouse gas emissions. The following general protection measures may apply to air quality and greenhouse gas emissions:

- IWW-13: Dredging Operations and Dredging Materials Reuse Plan

Integration of this general protection measure into project designs and plans would further reduce **less-than-significant** impacts related to other emissions (such as those leading to odors).

Impact 3.4-4: Emissions from future restoration projects permitted under the Order could expose sensitive receptors to substantial pollutant concentrations.

High concentrations of fugitive dust, CO, and TACs generated during construction activities are of particular concern for sensitive receptors. The study area contains vast rural areas that are sparsely populated as well as cities of significant size, density, and population.

Effects of Project Construction Activities

Construction activities from restoration projects permitted under the Order could include activities that would generate air pollutant emissions such as fugitive dust, CO, and TACs that could present health risks to sensitive receptors. The dose to which receptors are exposed is the primary factor used to determine health risk (i.e., potential exposure to TAC emission levels that exceed applicable standards). Dose is a function of the concentration of a substance and the duration of exposure. According to the California Office of Environmental Health Hazard Assessment, health risk assessments that determine the exposure of sensitive receptors to TAC emissions should be based on a 30-year exposure period (OEHHA 2015:8-1).

It is therefore important to consider that the use of off-road heavy-duty diesel equipment for construction of restoration projects permitted under the Order would be temporary, occurring in any one location for short periods of time. For example, setback levee construction is linear, and emissions would not take place in just one location for the duration of construction, which would take far less than 30 years.

It is also important to consider the proximity of the nearby sensitive receptors. Studies show that DPM is highly dispersive (e.g., DPM concentrations decrease by 70 percent at 500 feet from the source) (Zhu et al. 2002), and receptors must be close to emissions sources to result in the possibility of exposure to concentrations of concern. Although some projects, such as a setback levee, could be located near cities and communities of substantial size, density, and population, many would be far from sensitive receptors. For example, analysis of a project designed to restore the natural geomorphic processes and ecological functions of a marsh could find that the project would not

result in any major sources of emissions and would be required to comply with established standards and regulations for emissions.

The health impacts from exposure to these pollutants depend on the concentrations to which sensitive receptors are exposed, the duration of the exposure, and the toxicity of the pollutant. Although construction-related emissions would last no more than a few years and are transient, some construction activities for restoration projects permitted under the Order could occur over several years and could be close to sensitive receptors. For example, setback levee construction may be required near existing infrastructure, potentially exposing sensitive receptors to substantial concentrations of air pollutant emissions and TACs.

Because the construction activities for restoration projects permitted under the Order could expose sensitive receptors to substantial pollutant concentrations, this impact would be **potentially significant**.

The general protection measures listed for Impact 3.4-1 would be followed to reduce the impacts of ground-disturbing O&M activities for restoration projects permitted under the Order related to work area and speed limits and dust suppression.

As part of the State Water Board or Regional Board's issuance of a NOA for a restoration project under the Order, compliance with Mitigation Measure AIR-2 would be required when applicable to a given project. Implementation of this mitigation measure would be the responsibility of the project proponent(s) under the jurisdiction of the State Water Board, appropriate Regional Board, or other authorizing regulatory agency.

Mitigation Measure AIR-2: Minimize Construction Air Pollutant Emissions

Air quality analyses prepared for future restoration projects shall evaluate human health risks from potential exposures of sensitive receptors to substantial pollutant concentrations from the projects. The need for a human health risk analysis should be evaluated using approved screening tools, and discussed with the local air quality management district or air pollution control district during the preparation of the air quality analysis.

If the project's health risk is determined to be significant, control measures should be implemented to reduce health risks to levels below the applicable air district threshold.

Implementation of one or more of the following requirements, where feasible and appropriate, would reduce the effects of construction:

- Use equipment with diesel engines designed or retrofitted to minimize DPM emissions, usually through the use of catalytic particulate filters in the exhaust.
- Use electric equipment to eliminate local combustion emissions.
- Use alternative fuels, such as compressed natural gas or liquefied natural gas.

If the restoration project would result in significant emissions of airborne, naturally occurring asbestos, or metals from excavation, hauling, blasting, tunneling, placement, or other handling of rocks or soil, a dust mitigation and air monitoring plan shall identify individual restoration project measures to minimize emissions and

ensure that airborne concentrations of the TACs of concern do not exceed regulatory or risk-based trigger levels.

Mitigation Measure AIR-1 and AIR-2 would be implemented to reduce the impacts of restoration projects permitted under the Order. However, because the extent and location of such actions are not known at this time, it is not possible to conclude that the mitigation measure or equally effective mitigation measures, would reduce significant impacts to a less-than-significant level in all cases. Therefore, this impact would be **significant and unavoidable**.

Effects of Constructed Facilities (Natural or Artificial Infrastructure) and Operations and Maintenance of those Facilities

Restoration projects constructed under the Order could require periodic and routine maintenance work, such as removal of sediment within or near the facilities, vegetation removal, and inspection and maintenance of facilities. These O&M activities could generate emissions of air pollutants such as fugitive dust, CO, and TACs that, at high dosages, present health risks to sensitive receptors. For example, O&M activities necessary to support the functionality of constructed infrastructure may include maintenance and cleaning of fish screens, removal of debris and sediment from stream crossings, and fishways O&M, which would generate pollutant emissions.

Emissions-generating activities during the operational phase would be similar to those described for construction; however, the level of activity would be much lower in the operational phase than during construction. Sensitive receptors could be located in the vicinity of O&M activities, and thus could be exposed to air pollutants. As described above for construction impacts, the health impacts from exposure to these pollutants depend on the concentrations to which sensitive receptors are exposed, the duration of the exposure, and the toxicity of the pollutant. Operational activities would not be of sufficient duration or intensity to rise to the level of chronic exposure necessary to cause health impacts because: (1) routine O&M work would be temporary and intermittent, (2) activity levels would be less intense and less frequent during the operational phase than during construction, and (3) pollutants that would be emitted would not be of substantial toxicity at anticipated concentrations and duration. For example, the analysis of a project designed to restore the natural geomorphic processes and ecological functions of a marsh could find that the project would not result in any major sources of emissions and would be required to comply with established standards and regulations for emissions.

Restoration projects permitted under the Order could temporarily generate emissions of air pollutants. The specific locations and emissions of possible future facilities during O&M activities are not currently known; therefore, the precise air pollutant emissions impacts cannot be identified at this time. Factors necessary to identify specific impacts include the project’s location and operational characteristics, frequency and duration of emissions, and the location of sensitive receptors. However, given the temporary and intermittent nature of the impacts and the dissipation of pollutant concentrations, such emissions are unlikely to affect a substantial number of people. Impacts would be **less than significant**.

The general protection measures listed for Impact 3.4-1 would be followed to further reduce the **less-than-significant** impacts of ground-disturbing O&M activities for restoration projects permitted under the Order related to work area and speed limits and dust suppression.

Impact 3.4-5: Implementing future restoration projects permitted under the Order could result in an increase in GHG emissions that may have a significant impact on the environment.

Restoration projects permitted under the Order could be located in one or more air basins, some of which have established numeric thresholds for construction-generated GHG emissions that indicate when emissions are significant.

Effects of Project Construction Activities

Construction activities for restoration projects permitted under the Order could emit GHGs from fuel combustion during the use of construction equipment, trucks, worker vehicles, and dredging equipment. For example, a levee setback project would require extensive use of heavy equipment, such as excavators, graders, scrapers, bulldozers, backhoes, and dredges, which would result in GHG emissions. Numerous haul truck trips would be required to move borrow and/or spoils and other materials.

Equipment used for the construction of restoration projects permitted under the Order could increase GHG emissions in the short term. Following project completion, all construction emissions would cease.

Despite the intensity and duration of construction activities, and the lack of available mitigation measures to abate GHG emissions from heavy-duty construction equipment and on-road hauling emissions, the incremental contribution to climate change by the project's construction emissions could be short term and minimal. However, construction activities permitted under the Order could increase GHG emissions. The specific locations and GHG emissions of possible future projects are not currently known; therefore, the potential for significant construction-related GHG emissions impacts cannot be identified at this time. Factors necessary to identify specific impacts include the project's location and construction characteristics, and the frequency and duration of emissions. Impacts would be **potentially significant**. The Order does not include any general protection measures applicable to this impact.

As part of the State Water Board or Regional Board's issuance of a NOA for a restoration project under the Order, compliance with Mitigation Measure AIR-3 would be required when applicable to a given project. Implementation of this mitigation measure would be the responsibility of the project proponent(s) under the jurisdiction of the State Water Board, appropriate Regional Board, or other authorizing regulatory agency.

Mitigation Measure AIR-3: Minimize GHG Emissions

Restoration projects permitted under the Order shall implement the GHG mitigation measures listed in the most recent air district guidance documents (e.g., CAPCOA

2010; BAAQMD 2011), as appropriate for the project site and conditions. Current versions of such guidance documents list the following for construction of projects:

- Use alternative fuels for construction equipment.
- Use electric and hybrid construction equipment.
- Limit construction equipment idling beyond regulatory requirements.
- Institute a heavy-duty off-road vehicle plan.
- Implement a construction vehicle inventory tracking system.
- Use local building materials for at least 10 percent of total materials.
- Recycle or reuse at least 50 percent of construction waste or demolition materials.

In addition, the California Attorney General's Office has developed a list of measures and strategies to reduce GHG emissions at the individual project level. As appropriate, the measures can be included as design features of a restoration project, required as changes to the project, or imposed as mitigation (whether undertaken directly by the project proponent or funded by mitigation fees). The measures are examples; the list is not intended to be exhaustive. The following are best management practices to consider and implement (as applicable) during design, construction, and O&M of project facilities.

Transportation and Motor Vehicles

- Limit idling time for commercial vehicles, including delivery and construction vehicles.
- Use low- or zero-emission vehicles, including construction vehicles.
- Institute a heavy-duty off-road vehicle plan and a construction vehicle inventory tracking system for construction projects.
- Promote ridesharing.
- Provide the necessary facilities and infrastructure to encourage the use of low- or zero-emission vehicles (e.g., electric vehicle charging facilities and conveniently located alternative fueling stations).
- Provide a shuttle service to public transit/work sites.
- Provide information on all options for individuals and businesses to reduce transportation-related emissions.

SmartWay Truck Efficiency

This strategy involves requiring existing trucks/trailers to be retrofitted with the best available "SmartWay Transport" and/or CARB-approved technology. Technologies that reduce GHG emissions from trucks include devices that reduce aerodynamic drag and rolling resistance. Aerodynamic drag may be reduced using devices such as cab roof fairings, cab side gap fairings, cab side skirts, and on the trailer side, skirts, gap fairings, and trailer tail. Rolling resistance can be reduced using single wide tires or low-rolling resistance tires and automatic tire inflation systems on both the tractor and the trailer.

Tire Inflation Program

The strategy involves actions to ensure that vehicle tire pressure is maintained to manufacturer specifications.

Blended Cements

The strategy to reduce CO_2 emissions involves the addition of blending materials such as limestone, fly ash, natural pozzolan, and/or slag to replace some of the clinker in the production of Portland cement.

Anti-Idling Enforcement

The strategy guarantees emissions reductions as claimed by increasing compliance with anti-idling rules, thereby reducing the amount of fuel burned through unnecessary idling. Measures include enhanced field enforcement of anti-idling regulations, increased penalties for violations of anti-idling regulations, and restriction on registrations of heavy-duty diesel vehicles with uncorrected idling violations.

Because the extent and location of such actions are not known at this time, it is not possible to conclude that Mitigation Measure AIR-3, or equally effective mitigation measures, would reduce significant impacts to a less-than-significant level in all cases. It is reasonable to expect that construction activities could result in substantial GHG emissions, especially given the wide range of air district GHG emissions thresholds. For example, it is likely that GHG emissions would exceed local air district thresholds if the permitted action is undertaken by a lead agency that has adopted a net zero GHG emissions threshold. Therefore, this impact would be **significant and unavoidable**.

Effects of Constructed Facilities (Natural or Artificial Infrastructure) and Operations and Maintenance of those Facilities

Restoration projects permitted under the Order could consist of periodic and routine maintenance work such as sediment removal within or near the facilities, vegetation removal, and inspection and maintenance of facilities. Maintenance activities that would generate GHG emissions would be similar to those described for the construction of projects permitted under the Order; however, the level of activity, and therefore the level of emissions, would be much lower in the operational phase than during construction because activity would not be as intense during operations. Additionally, establishing, restoring, and enhancing tidal, subtidal, and freshwater wetlands would result in the creation of new wetlands, which sequester carbon. Carbon sequestration plays an important role in preventing global climate change by reducing greenhouse gas emissions and by preserving carbon "sinks" such as forests and wetlands. Therefore, establishing, restoring, and enhancing tidal, subtidal, and freshwater wetlands would provide more trees and plants which store carbon as they absorb CO_2 from the air, thus reducing net GHG emissions.

Restoration projects permitted under the Order could result in GHG emissions during O&M activities. However, the specific locations and emissions of possible future facilities are not known at this time. Factors necessary to identify site- or resource-specific impacts include the project’s location and construction characteristics, duration

of emissions, and the specific GHG thresholds of the local air quality district. Activities that generate GHG emissions would be similar to those described for the construction of projects permitted under the Order; however, the level of activity, and therefore the level of emissions, would be much lower during operations than during construction because activity would not cause an equal duration or concentration of emissions. Because operational emissions would not approach CARB's recommended thresholds and legislation that has established screening levels, the projects' GHG emissions would not be substantial and would not conflict with state and local planning efforts. Therefore, this impact would be **less than significant**. The Order does not include any general protection measures applicable to this impact.

Impact 3.4-6: Implementing future restoration projects permitted under the Order could conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

As described in Section 3.4.3, *Regulatory Setting*, most air districts, cities, and counties in the study area have plans and policies regarding the reduction of GHGs.

Effects of Project Construction Activities

Construction activities from restoration projects permitted under the Order could require the use of diesel-powered construction equipment such as excavators, graders, scrapers, bulldozers, and backhoes. Haul trucks would move borrow and/or spoils and other materials. These activities would emit GHGs. It is assumed that projects would be constructed in compliance with any policies that have been adopted as rules or regulations to reduce emissions of GHGs. However, construction activities may not be consistent with policies that have not been adopted as rules or regulations. For example, the construction of setback levees requires the use of some specialized off-road equipment that could result in significant GHG emissions. It may not be feasible to use electric or alternatively fueled equipment, which would conflict with a specific county's climate action plan. For example, the analysis of a project designed to restore the natural geomorphic processes and ecological functions of a marsh could find that, although any increase in GHG emissions would add to the quantity of emissions that contribute to global climate change, emissions associated with construction of the project would occur over a limited period. Following completion of the project, all construction emissions would cease and the project's construction-related GHG emissions would not be substantial and would not conflict with state and local planning efforts.

Construction of projects permitted under the Order could conflict with GHG emissions reduction policies, plans, and regulations. However, the specific locations and scale of possible future facilities are not currently known; therefore, the precise conflicts and subsequent impacts cannot be identified at this time. Factors necessary to identify specific impacts include the project's location, design features, and size, and the applicable GHG emissions reduction plans and policies of jurisdictions. Because it may not be feasible in all cases to comply with GHG emissions plans and policies, this impact would be **potentially significant**. The Order does not include any general protection measures applicable to this impact.

As part of the State Water Board or Regional Board's issuance of a NOA for a restoration project under the Order, compliance with Mitigation Measure AIR-1, AIR-2, and AIR-3 would be required when applicable to a given project. Implementation of this mitigation measure would be the responsibility of the project proponent(s) under the jurisdiction of the State Water Board, appropriate Regional Board, or other authorizing regulatory agency.

Mitigation Measures AIR-1, AIR-2, and AIR-3 would reduce the impacts of restoration projects permitted under the Order. However, because the extent and location of such actions are not known at this time, it is not possible to conclude that the mitigation measures, or equally effective mitigation measures, would reduce significant impacts to a less-than-significant level in all cases. It is possible that construction activities may not be consistent with policies that have not been adopted as rules or regulations. Therefore, this impact would be **significant and unavoidable**.

Effects of Constructed Facilities (Natural or Artificial Infrastructure) and Operations and Maintenance of those Facilities

Restoration projects permitted under the Order could would require periodic and routine maintenance work such as monitoring restoration projects and cleaning fish screens. Activities that would generate GHG emissions would be similar to those described for construction of projects permitted under the Order; however, activities would be less intense and less frequent in the operational phase than during construction. It is assumed that projects would be operated in compliance with any policies that have been adopted as rules or regulations to reduce emissions of GHGs.

The specific locations and scale of possible future facilities are not known at this time. Factors necessary to identify specific impacts include the project's location, design features, size, and the applicable GHG reduction plans and policies of jurisdictions. However, the level of activity and therefore the level of emissions would be much lower in the O&M phase than during construction because activity would not be as intense. Also, it is assumed that projects would be operated and maintained in compliance with any policies that have been adopted as rules or regulations to reduce emissions of GHGs. Therefore, this impact would be **less than significant**. The Order does not include any general protection measures applicable to this impact.